Innovative Models to Revive the Global Economy
Frontmatter

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Innovative Models to Revive the Global Economy

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Foreword

Alina Mihaela DIMA[1]*

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Since the world's pressures are becoming more challenging in these crisis times, the academic and business communities are concerned on how to define the new portrait of the reviving society. Aware that the new word is difficult to change in short time, the leaders of different public or private organizations have tried to stimulate thinking in order to overpass difficult times for better outcomes.

The *3rd international Conference on Economics and Social Sciences* organized by the Bucharest University of Economic Studies between 15-16 October 2020 is one of thousands of initiatives that created the context where some innovative ideas contribute to *system-level shifts* and promote the lessons and solutions for the next step of the digital word transformation.

This on-line edition entitled *Innovative models to revive the global economy*, *inspired* by the health and economic crisis, attracted more than 220 papers. The papers selected for presentation highlighted organizations that had scaled solutions for this on-going crisis. *Out of the 366 authors and co-authors*, there are *81 authors from 30 foreign countries as authors and co-authors of 52 papers who discussed the practical challenges encountered and the solutions adopted. This is a reflection that the new reality involves global concern and requires intercultural thinking for sustainable and long-term solutions.*

The chairs of the 12 sessions, primarily the deans and vice-deans of the schools of the university together with the co-chairs from the partner universities, were involved in the coordination of this relevant project of the university, proving responsibility and team spirit. This year's experience *will consolidate the research management* for the next editions of this conference, and it will enforce the idea of leadership through shared responsibilities.

The publishing agreement with *Sciendo offers greater visibility at international level captured in the publication of volume proceedings.* The Best Paper Awards are based on the merits and scientific relevance selected by an international scientific committee.

The conference hosted *the third meeting of UNESCO chairs on education for sustainable development with the kind support of the Romanian Commission for UNESCO and UNESCO Regional Office for Science and Culture in Europe*.

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* Editor.

The ICESS conference *is a very important tool used to validate and consolidate the position of our university as a strategic academic partner* according to the *international strategy of our university.* One of the main academic partners is Sapienza University, a reliable university partner, supporting the revival of this conference during these changing times.

The first keynote titled *The role of marketing in the company: drivers of success in marketing careers* was delivered by Berend Wierenga, a renowned marketing professor at Rotterdam School of Management. He has been highly nvolved in the main scene of marketing area as a Founder of the Marketing Management Department at Erasmus University and Scientific Director of Research Institute of Management, member of the European Marketing Academy, the Editor of the International Journal of Research in Marketing.

The second Keynote speech: *Tax pressure, tax evasion and perceived wellbeing. Fiscal morality and social sustainability* was delivered by Professor Maria Isabel Novo-Corti, affiliated at University of A Coruña, Spain. Her international academic reputation mainly achieved by the positions: Director of the Department of Economic Analysis and Business Administration, Director of the Atlantic Review of Economics, Guest editor of Journal of Cleaner Production and Energies is completed also by various teaching experiences at Washington University, Reading, Harvard University, University of Oxford and Universidad Autónoma de Madrid.

The 3rd international Conference on Economics and Social Sciences promised to be both stimulating and scientifically attractive with keynotes and invited session chairs from different regions of the world. Participants had the opportunity to debate and analyse papers from various sessions, workshops and tracks:

- Education for Sustainable Development: impact of universities on university, business, society;
- The role of innovation in public and private organizations;
- Fintech & Insurtech − towards a sustainable financial environment;
- Sustainability for future business;
- Current challenges within demographic data: measurement, collection, retrieval, analysis and reporting;
- The role of accounting in sustainable development;
- Economic Policies for Non-Cyclical Crises;
- Global challenges for agri-food systems and sustainable development;
- Financial perspectives in turbulent times;
- Marketing and Sustainability;
- Global world after crisis: towards a new economic model;
- Business Law and Sustainable Development.

The complex program offered to all participants great opportunities for analysis, interaction, debates, and feedback. We hope that ICESS 2020 conference was an international learning and networking on-line experience. With academic and business support and participation, the conference will continue successfully for a long time.

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Perfect Subgame Equilibrium in a Stackelberg Duopoly

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Abstract

Game theory is the perfect tool for modelling imperfect competition specific processes, manifested in relation to either the product quantity (Cournot or Stackelberg type), the product price (Bertrand type) or the quality. The equilibrium solution in output terms is highlighted in a Cournot scenario, whilst the price equilibrium solution can be revealed in a Bertrand situation. Despite the different strategy types on which the models are based, the common denominator is the fact that strategic choices are made simultaneously. The Stackelberg's model represents instead a perfect information sequential game (with firms advocating for quantity competition) and has both theoretical and practical applicability. In the simplest possible scenario, with two players moving in two stages, the leader will always choose a certain output level, while the follower will observe its decision and then establish its own action path accordingly. The main goal of this paper is to analyse a duopoly market with players adopting a Stackelberg behaviour. In any possible scenario, both firms are expected to survive and a stable equilibrium will manifest (the Subgame Perfect Equilibrium). The price will not react to the market demand curve slope variations and quantity and profit levels will be in an inverse dependence relationship with the aforementioned variable. The leader's chosen output and profit level will be higher than the output/profit of its follower.

Keywords: Stackelberg equilibrium, Stackelberg's model, Cournot's model, oligopoly, stability.

JEL classification: C72, D01, D43, L13

1. Introduction

As one fundamental representation of oligopoly games, the monopoly theory can be traced back two centuries ago when Antoine Augustine Cournot first put forward the mathematical model of duopoly competition (1838). Since then, Cournot's model became a starting point for the analysis of the oligopoly theory

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presenting a duopoly scenario, with firms producing homogeneous products and choosing to compete in terms of quantities, while also simultaneously taking decisions regarding the production level.

After almost a century, another duopoly market model has been developed by Heinrich von Stackelberg, with players competing also in terms of quantities, but this time the decisions being taken consecutively. Also known as Stackelberg competition and being an imperfect competition model based on a non-cooperative game, this reviewed model is mostly an extension of Cournot's model.

The model was developed by Stackelberg in his 1934 book "Market Structure and Equilibrium" and represents a breaking point in the market structure analysis, especially in the duopoly scenario. Based on different starting assumptions and offering conclusions different from those of the Cournot and Bertrand's models, this new duopoly model is a sequential game with perfect information (unlike the Cournot's model, which is a simultaneous game).

As previously anticipated, the model has a real theoretical importance, but also practical importance. It can be used in industrial organizations to study the market structure determinants and other related aspects like market entry and entry pre-emption (Berry & Reiss, 2007; Mueller, 1986; Sutton, 2007). The Stackelberg's model is also an excellent tool for the analysis of the hierarchical structure scenario. Zhang & Zhang, 2009 used a Stackelberg game to model the problem of spectrum allocation in Cognitive Radio Networks. A Stackelberg game-based approach has also been used to model the problem of efficient bandwidth allocation in the cloud-based wireless networks, where desktop users watching the same live channel may be willing to share their live-streaming with the nearby mobile users (Nan et al., 2014). Stackelberg game models have been widely used in the security domain to illustrate the attacker-defender models (Pita et al., 2009 – Los Angeles International Airport protection against terrorists; Michael & Scheffer, 2011 – adversarial learning modelling in the setup when the adversary tries to manipulate the data miner's data to reduce the accuracy of the classifier.; Clempner & Poznyak, 2015, Trejo et al., 2015; etc.). To conclude, theoretical Stackelberg game models have been widely used to model different situations in various real market areas.

Further investigation of the influence of market demand curve slope on Stackelberg static equilibrium model highlights other aspects such as firm stability and demand curve slope impact on the perfect subgame equilibrium theory. The principles of the related mathematical model are also described below.

2. The Model

The background used is one with two firms, which sell homogeneous products, subject to the same demand and cost functions. One of them, the leader, has the right to make the first move, thanks to certain potential advantages such as market power, historical precedence, sophistication, size, reputation, innovation, information and so forth. Stackelberg assumes that this duopolist is sufficiently sophisticated to recognize that its competitor acts according to the Cournot

assumption; this allows it to determine the reaction curve of its competitor and include it in its own profit function, acting as a monopolist in the attempt of maximizing its payoff. The other one, the follower, observes its strategy and decides about its own accordingly; its profit depends on the leader's chosen output level which is predetermined in its opinion, therefore will be considered an invariable information.

It is worthwhile mentioning that the leader's action is irreversible as it is aware ex ante that the follower observes its actions, establishing accordingly its own action path. The first mover advantage is undeniable, triggering the idea that the first player yields a higher payoff than the second player does.

An example of such leadership may be Microsoft's dominance in software markets. Although Microsoft can make decisions first, other smaller companies react to Microsoft's actions when making their own decisions. The actions of these followers, in turn, affect Microsoft. Another potential Stackelberg leadership scenario is highlighted in the aircraft industry: Airbus and Boeing competition (Waldman & Jensen, 2016).

Let's consider a general price function P(Q), which can be better expressed as $P(q_1 + q_2)$, giving the existing duopoly scenario, where q_1 and q_2 represent the leader/follower output level and Q the aggregate market demand:

$$P(Q) = P(q_1 + q_2)$$

We also assume that firm i has the cost structure $C_i(q_i), i = \overline{1,2}$.

To solve the model and find the Stackelberg equilibrium (perfect subgame equilibrium), we need to use backward induction, as in any sequential game. The leader anticipates the follower's best reaction, more precisely, how the latter will respond once it has observed its decision. The leader chooses the quantity q_1 which maximizes its payoff, to which the follower reacts by picking the expected quantity q_2. We should first determine the follower's best response function.

The profit function for the player 2 (the follower) will be:

$$\pi_2 = P(q_1 + q_2)q_2 - C_2(q_2)$$

The first order derivative expression can be seen below:

$$\frac{\delta\pi_2}{\delta q_2} = \frac{\delta P(q_1 + q_2)}{\delta q_2} q_2 + P(q_1 + q_2) - \frac{\delta C_2(q_2)}{\delta q_2}$$

whilst setting marginal profit expression to zero value opens the path for finding out the follower's best reply function.

We are looking forward now to the best reply function of the leader:

$$\pi_1 = P(q_1 + q_2(q_1))q_1 - C_1(q_1)$$

where $q_2(q_1)$ is the follower's quantity as a strictly dependent function of the leader's output, as we have previously agreed. Finally, the leader's marginal profit expression, who is leading to its best reply function, is described as follows:

$$\frac{\delta\pi_1}{\delta q_1} = \frac{\delta P(q_1 + q_2)}{\delta q_2} \frac{\delta q_2(q_1)}{\delta q_1} q_1 + \frac{\delta P(q_1 + q_2)}{\delta q_1} q_1 + P(q_1 + q_2(q_1)) - \frac{\delta C_1(q_1)}{\delta q_1}$$

Let's further consider the scenario of a downward slope of the linear demand curve, where the price dependence can be described as follows:

$$P(q_1 + q_2) = a - b(q_1 + q_2)$$

where a>0, b>0 and P represents the price paid by consumers for purchasing the required product quantity. The previously mentioned inverse demand function is getting close to the second product particular case of the mathematical formula used by Kresimir Zigic (2012) in his analysis, which presents a Stackelberg scenario using differentiated products (where b $\in$(0,1) reflecting the degree of product differentiation or substitutability).

Adjusting the above mentioned formulas to the current hypothesis, the follower's profit function expression becomes:

$$\pi_2 = [a - b(q_1 + q_2)]q_2 - C_2(q_2)$$

Marginal profit expressions represent the starting point in the follower's reaction function, revealing: (see Appendix A):

$$q_2 = \frac{a - bq_1 - \frac{\delta C_2(q_2)}{\delta q_2}}{2b}$$

The spring of further determination of equilibrium values is represented by the leader's profit function:

$$\pi_1 = \big[a - b\big(q_1 + q_2(q_1)\big)\big]q_1 - C_1(q_1)$$

and the mathematical calculation (related calculations in Appendix A) leads to:

$$q_1^* = \frac{a + \frac{\delta C_2(q_2)}{\delta q_2} - 2\frac{\delta C_1(q_1)}{\delta q_1}}{2b} \qquad q_2^* = \frac{a - 3\frac{\delta C_2(q_2)}{\delta q_2} + 2\frac{\delta C_1(q_1)}{\delta q_1}}{4b}$$

where q_1^* represent the leader's best response to the follower's reaction, and q_2^* represents the follower's reaction function. That means the market demand level in the equilibrium scenario is:

$$Q^* = q_1^* + q_2^* = \frac{3a - \frac{\delta C_2(q_2)}{\delta q_2} - 2\frac{\delta C_1(q_1)}{\delta q_1}}{4b}$$

and further, the equilibrium price:

$$p^* = \frac{a + \frac{\delta C_2(q_2)}{\delta q_2} + 2\frac{\delta C_1(q_1)}{\delta q_1}}{4}$$

Referring now to the cost function, for the simplicity of calculation understanding, we can impose some mathematical restrictions:

$$\frac{\delta^2 C_i(q_i)}{\delta q_i\, \delta q_j} = 0;\ \ \frac{\delta C_i(q_i)}{\delta q_j} = 0;\ \ i, j = \overline{1,2}$$

and from all types of function dealing with, we pick the linear function $C_i(q_i) = c_i q_i$.

By also including this last hypothesis in our model, the Stackelberg perfect subgame equilibrium values become:

$$q_1^* = \frac{a-c}{2b} \qquad q_2^* = \frac{a-c}{4b} \qquad p^* = \frac{a+3c}{4}$$

$$\pi_1^* = \frac{(a-c)^2}{8b} \qquad \pi_2^* = \frac{(a-c)^2}{16b}$$

The results obtained lead to the following conclusions:

- $q_1^* > q_2^*$, meaning that the leader produces more; being more specific, the leader's output is twice as much the follower's;
- $p^* > c$, confirming for both players the possibility of making profits;
- $\pi_1^* > \pi_2^*$, the leader registers higher (double) profit, therefore highlighting a real advantage to move first. There are two main reasons leading to this: the leader knows that by increasing its output level, it will force the follower to reduce its own and this decision is irreversible (by undoing its action, we would reach the Cournot scenario).
- $Q^* > Q_{COURNOT} \rightarrow p^* < p_{COURNOT}$. The Stackelberg game leads to a more competitive equilibrium than the Cournot game.

We are now treating the b = 1 scenario - perfect substitute products. Therefore, p=a-q1-q2 highlighting the most simple possible form for price-output mathematical relation. Thus p+Q =a, meaning their sum remains constant, equalizing a parameter. The quantity offered by the leader will be $q_1 = \frac{a-c}{2}$ whilst the follower's response is $q_1 = \frac{a-c}{4}$. The price value suffered no modification $p = \frac{a+3c}{4}$ as it is not at all affected by the b parameter variation; looking further, we can observe that the leader/follower profit level became $\pi_1 = \frac{(a-c)^2}{8}$ respectively $\pi_2 = \frac{(a-c)^2}{16}$.

We further analyse the quantity/profit sensitivity to the b parameter value changes, in a perfect subgame equilibrium scenario (the price is not related to the slope, being constant at any a and c hypothetical value pairs.). All mathematical calculations representing the graphical analysis basis below are highlighted in the Appendix B, whilst in our simulation, we customise the a and c parameters, as follows: a = 100 EUR; c = 40 EUR. Using these assumptions, we start the gradual increase in the b parameter with a convenient ratio of 0.10, from the initial 0.1 value, up to the 3.0 final value.

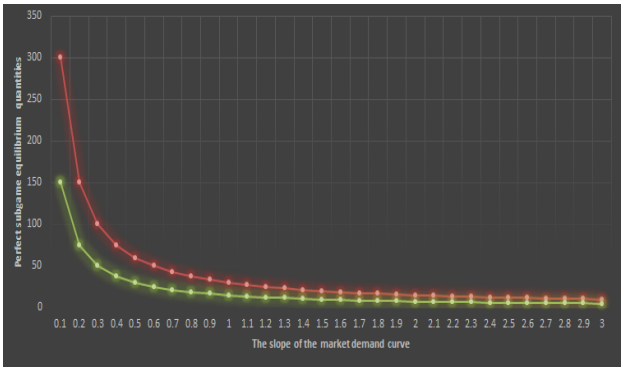

Figure 1. Perfect subgame equilibrium quantity evolution
Source: own processing

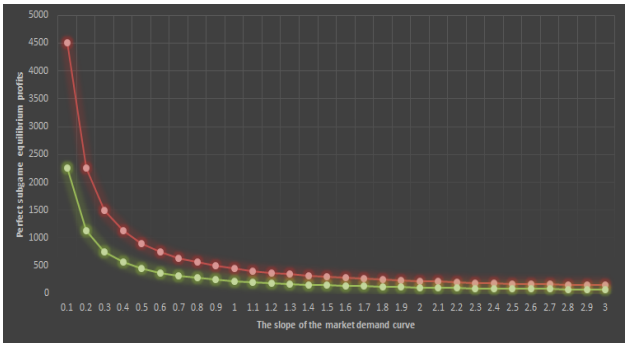

Figure 2. Perfect subgame equilibrium profit evolution
Source: own processing

Conclusions

Despite the fact that the b parameter value is continuously changing, it is easy to notice that the equilibrium price remains constant, due to the fact that its mathematical expression depends only on the a and c parameters. More precisely, regardless of the b value growth from 0.1 to 3, the equilibrium price still remains at the 55 EUR level.

As for the quantity triggering the equilibrium scenario, a downward trend is highlighted, starting with 5*(a-c) (the leader's case)/ 2.5*(a-c) (the follower's case). The explanation is also mathematical, deriving from the simple fact that ${q_1}^{*\prime} = -\frac{a-c}{2b^2}, {q_2}^{*\prime} = -\frac{a-c}{4b^2}$ are negative expressions, this kind of monotony being specific for the decreasing functions. Going further, ${q_1}^{*\prime\prime} = \frac{a-c}{b^3}, {q_2}^{*\prime\prime} = \frac{a-c}{2b^3}$, strictly positive second order derivatives explaining the convex type graph. By reference to the figures, the equilibrium quantity level registers a decreasing trend from its initial value of 300 kg (leader) / 150 kg (follower), down to zero value (not tangible, because y=0 represents an horizontal asymptote, as well as x=0 in fact).

In the profit equilibrium scenario, a downward trend can be noticed as well, starting from 1.25 (a-c)2 (leader) / 0.625 (a-c)2 (follower) down to zero, value which would also never be reached. Math principles offer one more time the key, as $\pi_1{}^{*\prime} = -\frac{(a-c)^2}{8b^2}$, $\pi_2{}^{*\prime} = -\frac{(a-c)^2}{16b^2}$, a strictly negative expression reflecting a decreasing function. From the same above mentioned reasons (second order positive derivatives), we meet a function convexity scenario. Given the previous hypothesis, a downward profit trend can be noticed, beginning with 4.500 EUR (leader) / 2.250 EUR (follower) down to a minimum profitability level (zero profit – not tangible, with y=0 also a horizontal asymptote).

3. Graphical Approach

In the next paragraphs, we shall try to explain the Stackelberg's model, making use of the graphical method, based on the duopolists' reaction functions. First of all, we will deduce the general expression of the leader's isoprofit curve, and looking forward, its competitor's best response:

$\pi^1(q_1, q_2) = [a - b(q_1 + q_2) - c]q_1$, then $\bar{\pi} = [a - b(q_1 + q_2) - c]q_1 = aq_1 - bq_1^2 - bq_1q_2 - cq_1$

$$\rightarrow bq_1q_2 = (a-c)q_1 - bq_1^2 - \bar{\pi} \rightarrow q_2 = \frac{a-c}{b} - q_1 - \frac{\bar{\pi}}{bq_1}$$

Each isoprofit curve highlights a constant level of profit that could be obtained by one player at different output levels chosen by it and its competitor. The follower's first order derivative expression offers very important information regarding the isoprofit curve trend (ascending/descending), whilst the second order derivative highlights the concavity related to the axes:

$$\frac{dq_2}{dq_1} = -1 + \frac{\bar{\pi}}{bq_1^2} \rightarrow \frac{d^2q_2}{dq_1^2} = -\frac{2\bar{\pi}}{bq_1^3} < 0$$

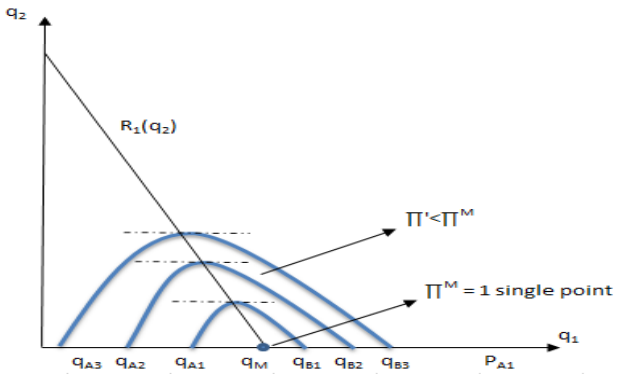

Figure 3. Leader's isoprofit and best reply functions
Source: own processing

Firm 1 (the leader) will always choose its best response, reflected on the isoprofit curve that corresponds to the maximum profit, at a q_2 given level.

The point of intersection of the reaction function with the isoprofit curves has the mathematical zero slope property (Machado, 2008)

$$R_1(q_2) = argmax\, \pi^1(q_1, q_2) \rightarrow \pi_1^1(R_1(q_2), q_2) = 0.$$

Besides, we already know that $\pi^1(q_1, q_2) = \bar{\pi} \rightarrow \pi_1^1 dq_1 + \pi_2^1 dq_2 = 0 \rightarrow \frac{dq_2}{dq_1} = -\frac{\pi_1^1}{\pi_2^1}$, then the resulting derivative $\frac{dq_2}{dq_1}$ should be nil in leader's best response scenario $q_1 = R_1(q_2)$.

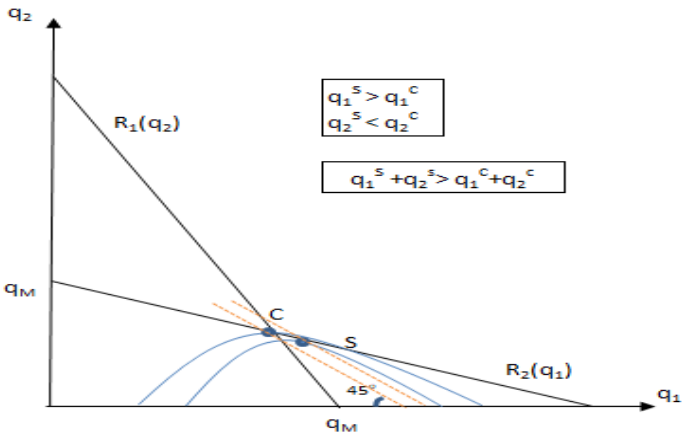

Figure 4. Stackelberg equilibrium vs. Cournot equilibrium
Source: own processing

The leader's optimal behaviour is reached in the tangency point S of its isoprofit curve with the reaction curve of the follower (firm 2), whilst C would be the Cournot equilibrium, where the reaction curves cross and where dq2/dq1=0 (as previously mentioned). All three mentioned relations can be easily proved either by comparing the specific equilibrium values (see below) of Stackelberg & Cournot's models or by a simple figure analysis.

$$q_1^S = \frac{a-c}{2b} = \frac{3}{2}\frac{a-c}{3b} = \frac{3}{2}\, q_1^C > q_1^C \qquad q_2^S = \frac{a-c}{4b} = \frac{3}{4}\frac{a-c}{3b} = \frac{3}{4}\, q_2^C < q_2^C$$

$$Q^S = q_1^S + q_1^S = \frac{3(a-c)}{4b} > \frac{2(a-c)}{3b} = q_1^C + q_1^C = Q^C$$

$$p^S = \frac{a+3c}{4} < \frac{a+2c}{3} = p^C \overset{a>c}{\longleftarrow} \frac{a+3c}{4} < \frac{a+2c}{3} \rightarrow 3a + 9c < 4a + 8c \rightarrow c < a\ (A)$$

$$\pi_1^S = \frac{(a-c)^2}{8b} = \frac{9}{8}\frac{(a-c)^2}{9b} = \frac{9}{8}\pi_1^C > \pi_1^C \qquad \pi_2^S = \frac{(a-c)^2}{16b} = \frac{9}{16}\frac{(a-c)^2}{9b} = \frac{9}{16}\pi_2^C < \pi_2^C$$

Conclusions: In the symmetric firms scenario (costs are matching), the Stackelberg solution is superior to the Cournot solution (higher aggregate output, lower price, higher aggregate profits). From the other point of view, the first firm profit level should not be lower than in Cournot scenario because the leader could have always obtained the Cournot profit levels by simply choosing the Cournot quantity q_1^C, to which its competitor would have replied with its Cournot quantity $q_2^C = R_2(q_1^C)$, as the follower's reaction curve in Stackelberg is the same as in Cournot.

References

[1] Berry, S., & Reiss, P. (2007). Empirical models of entry and market structure. In: *Handbook of Industrial Organization*, 3, pp. 1845-1886.

[2] Clempner, J. B., & Poznyak, A. S. (2015). *Stackelberg Security Games: Computing The Shortest-Path Equilibrium. Expert Systems with Applications*, 42, pp. 3967-3979.

[3] Machado, M. (2008). *Economia Industrial*, Cap. 3.2 - Competencia (secuencial) en cantidades Modelo de Stackelberg. Retrieved from https://www.academia. edu/16477977/1_1.Monopolio_modelo_basico.

[4] Michael, B., & Scheffer, T. (2011). Stackelberg Games for Adversarial Prediction Problems. In *Proceedings of the 17th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pp. 547-555. San Diego, California, USA: ACM. doi:10.1145/2020408.2020495.

[5] Mueller, D.C. (1986). *Profits in the Long Run*. Cambridge University Press.

[6] Nan, G. et al. (2014). Stackelberg Game for Bandwidth Allocation in Cloud-based Wireless Live-streaming Social Networks. *IEEE Systems Journal*, 8, pp. 256-267.

[7] Pita, J., Jain, M., Ordonez, F., Portway, C., Tambe, M., Western, C., Paruchuri, P., Kraus, S. (2009). Using Game Theory for Los Angeles Airport Security. *AI MAGAZINE*, 30, pp. 43-57. doi: http://dx.doi.org/10.1609/aimag.v30i1.2173.

[8] Sutton, J. (2007). Market structure: theory and evidence. In *Handbook of Industrial Organization*, 3, pp. 2301-2368.

[9] Trejo, K. K., Clempner, J. B., & Poznyak, A. S. (2015). A Stackelberg security game with random strategies based on the extraproximal theoretic approach. *Engineering Applications of Artificial Intelligence*, 37, pp. 145-153. doi:10.1016/j.engappai. 2014.09.002.

[10] Von Stackelberg, H. (1934). *Marktform und Gleichgewicht* [Market Structure and Equilibrium - translated by Damien Bazin, Lynn Urch and Rowlnd Hill].

[11] Waldman, D. E., Jensen, E. J. (2016). *Industrial organisation. Theory and practice*, Forth Edition.

[12] Zhang, J., & Zhang, Q. (2009). Stackelberg Game for Utility-Based Cooperative Cognitive Radio Networks. In U. New Orleans, LA (Ed.), *Proceedings of the Tenth ACM International Symposium on Mobile Ad Hoc Networking and Computing*, pp. 23-32. ACM. doi:10.1145/1530748.1530753.

[13] Žigić, K. (2012). Stackelberg leadership with product differentiation and endogenous entry: some comparative static and limiting results. *Journal of Economics*, 99(3), pp. 251-266.

Appendix A

$$\frac{\delta\pi_2}{\delta q_2} = 0 \rightarrow \frac{\delta[a - b(q_1 + q_2)]}{\delta q_2} q_2 + a - b(q_1 + q_2) - \frac{\delta C_2(q_2)}{\delta q_2}$$

$$= -bq_2 + a - b(q_1 + q_2) - \frac{\delta C_2(q_2)}{\delta q_2} = 0$$

$$-2bq_2 = \frac{\delta C_2(q_2)}{\delta q_2} - a + bq_1 \;\rightarrow\; q_2 = \frac{a - bq_1 - \frac{\delta C_2(q_2)}{\delta q_2}}{2b}$$

$$\pi_1 = \left[a - b\left(q_1 + q_2(q_1)\right)\right]q_1 - C_1(q_1)$$

$$= \left(a - b\left(q_1 + \frac{a - bq_1 - \frac{\delta C_2(q_2)}{\delta q_2}}{2b}\right)\right)q_1 - C_1(q_1)$$

$$= \left(a - bq_1 - \frac{a - bq_1 - \frac{\delta C_2(q_2)}{\delta q_2}}{2}\right)q_1 - C_1(q_1) = \frac{a - bq_1 + \frac{\delta C_2(q_2)}{\delta q_2}}{2} q_1 - C_1(q_1)$$

$$\frac{\delta\pi_1}{\delta q_1} = 0 \rightarrow \frac{a - bq_1 + \frac{\delta C_2(q_2)}{\delta q_2}}{2} - \frac{bq_1}{2} - \frac{\delta C_1(q_1)}{\delta q_1} = \frac{a - 2bq_1 + \frac{\delta C_2(q_2)}{\delta q_2}}{2} - \frac{\delta C_1(q_1)}{\delta q_1} = 0$$

$$-bq_1 + \frac{a + \frac{\delta C_2(q_2)}{\delta q_2}}{2} - \frac{\delta C_1(q_1)}{\delta q_1} = 0 \rightarrow q_1^* = \frac{a + \frac{\delta C_2(q_2)}{\delta q_2} - 2\frac{\delta C_1(q_1)}{\delta q_1}}{2b}$$

$$q_2^* = \frac{a - b\frac{a + \frac{\delta C_2(q_2)}{\delta q_2} - 2\frac{\delta C_1(q_1)}{\delta q_1}}{2b} - \frac{\delta C_2(q_2)}{\delta q_2}}{2b} \rightarrow q_2^* = \frac{a - 3\frac{\delta C_2(q_2)}{\delta q_2} + 2\frac{\delta C_1(q_1)}{\delta q_1}}{4b}$$

$$q^* = q_1^* + q_2^* = \frac{a + \frac{\delta C_2(q_2)}{\delta q_2} - 2\frac{\delta C_1(q_1)}{\delta q_1}}{2b} + \frac{a - 3\frac{\delta C_2(q_2)}{\delta q_2} + 2\frac{\delta C_1(q_1)}{\delta q_1}}{4b}$$

$$= \frac{3a - \frac{\delta C_2(q_2)}{\delta q_2} - 2\frac{\delta C_1(q_1)}{\delta q_1}}{4b}$$

$$p^* = a - b(q_1^* + q_2^*) = a - b\frac{3a - \frac{\delta C_2(q_2)}{\delta q_2} - 2\frac{\delta C_1(q_1)}{\delta q_1}}{4b} \rightarrow$$

$$p^* = \frac{a + \frac{\delta C_2(q_2)}{\delta q_2} + 2\frac{\delta C_1(q_1)}{\delta q_1}}{4}$$

$$C_i(q_i) = cq_i \rightarrow \frac{\delta C_i(q_i)}{\delta q_i} = c_i(q_i) = c, (\forall)\, i = \overline{1,2}$$

$$q_1^* = \frac{a - c}{2b} \qquad q_2^* = \frac{a - c}{4b} \qquad p^* = \frac{a + 3c}{4}$$

$$\pi_1^* = (p^* - c)q_1^* = \left(\frac{a+3c}{4} - c\right)\frac{a-c}{2b} = \frac{(a-c)^2}{8b}$$

$$\pi_2^* = (p^* - c)q_2^* = \left(\frac{a+3c}{4} - c\right)\frac{a-c}{4b} = \frac{(a-c)^2}{16b}$$

$$q_1^* = 2q_2^* \qquad \pi_1^* = 2\pi_2^*$$

Appendix B

Table 1. Simulation of price, quantity and profit evolution

b	p	q_1	q_2	π_1	π_2
0.1	0.25*a+0.75*c	5.000000*(a-c)	2.500000*(a-c)	1.250000*(a-c)^2	0.625000*(a-c)^2
0.2	0.25*a+0.75*c	2.500000*(a-c)	1.250000*(a-c)	0.625000*(a-c)^2	0.312500*(a-c)^2
0.3	0.25*a+0.75*c	1.666667*(a-c)	0.833333*(a-c)	0.416667*(a-c)^2	0.208333*(a-c)^2
0.4	0.25*a+0.75*c	1.250000*(a-c)	0.625000*(a-c)	0.312500*(a-c)^2	0.156250*(a-c)^2
0.5	0.25*a+0.75*c	1.000000*(a-c)	0.500000*(a-c)	0.250000*(a-c)^2	0.125000*(a-c)^2
0.6	0.25*a+0.75*c	0.833333*(a-c)	0.416667*(a-c)	0.208333*(a-c)^2	0.104167*(a-c)^2
0.7	0.25*a+0.75*c	0.714286*(a-c)	0.357143*(a-c)	0.178571*(a-c)^2	0.089286*(a-c)^2
0.8	0.25*a+0.75*c	0.625000*(a-c)	0.312500*(a-c)	0.156250*(a-c)^2	0.078125*(a-c)^2
0.9	0.25*a+0.75*c	0.555556*(a-c)	0.277778*(a-c)	0.138889*(a-c)^2	0.069444*(a-c)^2
1.0	0.25*a+0.75*c	0.500000*(a-c)	0.250000*(a-c)	0.125000*(a-c)^2	0.062500*(a-c)^2
1.1	0.25*a+0.75*c	0.454545*(a-c)	0.227273*(a-c)	0.113636*(a-c)^2	0.056818*(a-c)^2
1.2	0.25*a+0.75*c	0.416667*(a-c)	0.208333*(a-c)	0.104167*(a-c)^2	0.052083*(a-c)^2
1.3	0.25*a+0.75*c	0.384615*(a-c)	0.192308*(a-c)	0.096154*(a-c)^2	0.048077*(a-c)^2
1.4	0.25*a+0.75*c	0.357143*(a-c)	0.178571*(a-c)	0.089286*(a-c)^2	0.044643*(a-c)^2
1.5	0.25*a+0.75*c	0.333333*(a-c)	0.166667*(a-c)	0.083333*(a-c)^2	0.041667*(a-c)^2
1.6	0.25*a+0.75*c	0.312500*(a-c)	0.156250*(a-c)	0.078125*(a-c)^2	0.039063 (a-c)^2
1.7	0.25*a+0.75*c	0.294118*(a-c)	0.147059*(a-c)	0.073529*(a-c)^2	0.036765*(a-c)^2
1.8	0.25*a+0.75*c	0.277778*(a-c)	0.138889*(a-c)	0.069444*(a-c)^2	0.034722*(a-c)^2
1.9	0.25*a+0.75*c	0.263158*(a-c)	0.131579*(a-c)	0.065789*(a-c)^2	0.032895*(a-c)^2
2.0	0.25*a+0.75*c	0.250000*(a-c)	0.125000*(a-c)	0.062500*(a-c)^2	0.031250*(a-c)^2
2.1	0.25*a+0.75*c	0.238095*(a-c)	0.119048*(a-c)	0.059524*(a-c)^2	0.029762*(a-c)^2
2.2	0.25*a+0.75*c	0.227273*(a-c)	0.113636*(a-c)	0.056818*(a-c)^2	0.028409*(a-c)^2
2.3	0.25*a+0.75*c	0.217391*(a-c)	0.108696*(a-c)	0.054348*(a-c)^2	0.027174*(a-c)^2
2.4	0.25*a+0.75*c	0.208333*(a-c)	0.104167*(a-c)	0.052083*(a-c)^2	0.026042*(a-c)^2
2.5	0.25*a+0.75*c	0.200000*(a-c)	0.100000*(a-c)	0.050000*(a-c)^2	0.025000*(a-c)^2
2.6	0.25*a+0.75*c	0.192308*(a-c)	0.096154*(a-c)	0.048077*(a-c)^2	0.024038*(a-c)^2
2.7	0.25*a+0.75*c	0.185185*(a-c)	0.092593*(a-c)	0.046296*(a-c)^2	0.023148*(a-c)^2
2.8	0.25*a+0.75*c	0.178571*(a-c)	0.089286*(a-c)	0.044643*(a-c)^2	0.022321*(a-c)^2
2.9	0.25*a+0.75*c	0.172414*(a-c)	0.086207*(a-c)	0.043103*(a-c)^2	0.021552*(a-c)^2
3.0	0.25*a+0.75*c	0.166667*(a-c)	0.083333*(a-c)	0.041667*(a-c)^2	0.020833*(a-c)^2

Source: own processing

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New Ways of Promoting and Reaching the Hearts and Minds of Stakeholders

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Abstract

Companies and organizations want and try to reach their stakeholders by means of interesting and more intriguing ways and channels. No matter if we speak about the four mass media communication channels, like the TV, internet, radio and written press, or through social media networks, different apps and even games. Their purpose is to raise awareness and interest towards their ideas, products or brands. In addition, even to determine the stakeholders to change their behaviour, or the way they think and act in relation to an organization. In the today's noise, it is more than difficult and challenging for a company to reach its desired segment market. An analysis of several successful case studies used by organizations to reach their wanted target audience will be conducted in this article. The strategies revealed can also be applied by other organizations, but paying much attention towards the certain traits and peculiarities of the audience. Therefore, an ad can be considered to be very successful and intriguing in a country on the one hand, but on the other hand, in another country, the same ad can be categorized as being vulgar, thus resulting instead in an unwanted behaviour.

Keywords: communication, interesting, intriguing, marketing campaigns, promotion, ads.

JEL Classification: M30, M37

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1. Promotion and Communication, New Trends and Obstacles

Nowadays, organizations are finding it increasingly difficult to reach the desired market segment and we can refer here not only to the actual customers, but especially to the potential customers. For instance, in the case of the actual customers, the company can obtain the contact details relatively easily (Bodislav, A. et al., 2019). This can be done in several ways; either the purchase takes place from the company website and the customer must register by revealing the ways in which he/she can be contacted, or by organizing different promotional campaigns, where the participants are asked for such information (Rădulescu et al., 2018). Of course, in the context of the new regulations in the field of direct communication and especially of the GDPR, without the prior approval expressed by the customer, it would be quite difficult to achieve this communication in compliance with the law (Alpopi et al., 2018). The problem raised by the multitude of media channels and the possibilities of transmitting the message consists not only in the legal ways to transmit the message, but also in the abundance of messages with which they are "bombarded", and the company is unable to transmit the desired message. Because of this, organizations are trying to differentiate themselves from competitors, with VIPs, with elements that shock the audience, precisely to draw their attention to the brand, to change the behaviour, as Sandy Hook Promise non-governmental organization is trying to achieve. The main purpose is to attract the interest and, at the same time, to raise awareness, so that the audience and the stakeholders change both their consumption behaviour and the attitude, the way of looking at certain aspects of daily life, as we will present in the case studies analysed (Burlacu, 2015) (Carra et al., 2016). The strategies and campaigns used can be considered successful and intriguing in some countries, and thus achieve their purpose, but on the other hand, in other countries they can be considered vulgar, taboo and even result in unwanted behaviours.

Although the communication model is considered to be only linear by some academics, it is considered by other researchers to be much more complex and even circular, as can be seen in figure 1. Schramm model (Blythe, 2009) demonstrates that the process for transmitting the message is circular and it is also affected by factors such as interference or noise that may result in diminishing or even not transmitting the message desired to be sent by organizations. The message is transmitted through the media and channels considered most appropriate to reach the desired audience, and more specifically the internet, television, radio and print media. The order of enumeration can also be justified by the fact that the Internet can also be used as a means and medium for transmitting the other three mass communication channels (Pricop et al., 2016). Nowadays, there are many radio stations, but also newspapers, magazines that transmit news, information or entertainment programs exclusively online, taking into account the costs, but also the ease of reaching the target audience (Faggianelli et al., 2018). The message, after it is encoded (Hackley, 2005) by the transmitter and transmitted, it is decoded by the receiver, which in some cases can even provide instant feedback. This helps companies, because in some cases where sensitive topics are touched, the company

does not have to wait to analyse the reports on the marketing of products and more specifically, the increase or decrease in sales, as in the past (Carra et al., 2017, 2018). Most organizations are aware that communication is no longer one-way, but two-way (Bran et al., 2018). The recipient of the message is no longer influenced exclusively by his/her experience, but also by the level of education and intelligence. Often, some commercials are very technical and explanatory, trying to demonstrate certain processes of how to reach a certain result, using the product of the company brand; an edifying example can be given by the advertisements for detergents (Bran et al., 2018). The feedback received by the broadcasters is in turn influenced by their experience.

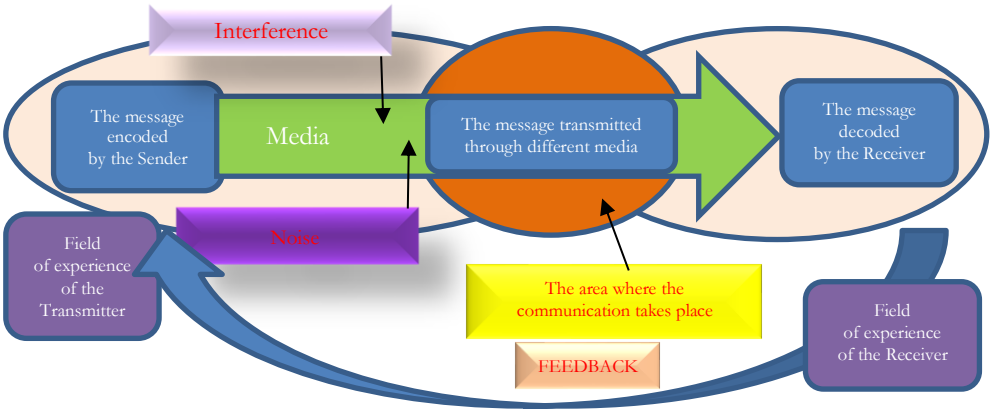

Figure 1. Schramm's model of communication

Source: Blythe, J. (2009). *Key Concepts in Marketing*, London: SAGE Publications Ltd

2. New Ways to Send Messages and Change Customer Behaviour

Marketing communication tools (Hackley, 2005) should portray brands, and besides that, they should get together to transmit the logo, brand name, advertising and other communication methods so that the promotion becomes as suggestive and powerful as possible. When using innovative and sometimes even shocking ideas, taking into account the fact that you have to differentiate yourself from the competition, the result may not be the expected one.

The first promotional campaign taken for analysis is the campaign created by Mars company together with the advertising agency BBDO, Snickers brand - "You're not you when you're hungry". The campaign was launched (Keane, 2018) on the occasion of the Super Bowl in 2010, although the chocolate bar has been introduced to the market since 1930, it has managed to increase sales by about 15.9% globally, and with the help of this campaign it is used even in 2019, simultaneously on several other markets worldwide. The main messages to be transmitted are the fact that you cannot react in the best way when you are hungry, and the feeling of hunger leads to embarrassing situations. Since the very first

advertisement, they hired VIPs, actors, singers, comedians, sportsmen such as: Betty White and Abe Vigoda, Richard Lewis, Roseanne Barr, Mr. Bean, Joe Pesci, Liza Minnelli, Aretha Franklin, Don Rickles, Robin Williams, Bobcat Goldthwait, Danny Trejo, Steve Buscemi, Wiliem Dafoe, Joan Collins, Mickey Rourke, Elton John and even Ronaldo Luís Nazário de Lima. Even more than that, in different countries they have used nationally renowned VIPs in markets such as China or Russia. This campaign has well been used so far; it has expanded and even addresses new issues.

In Australia in 2016, the BBDO advertising agency, along with MediaCom Melbourne, came up with the idea of creating an algorithm whereby the price of a Snickers stick (Green, 2017) fluctuates depending on the stress and irritation level of the Internet users on social networks. Thus, the company has tried to solve two problems that the contemporary society usually faces namely the daily stress and the feeling of hunger. In 2016, they created an algorithm (Stanley, 2017), "Hungerithm", by which the reaction of people on social media networks such as: Facebook, Twitter and YouTube was analysed and interpreted, and as negative emotions increased in number and intensity, the price for a Snicker stick decreased. Although, at first glance, (dtcollective.org, 2017) the mechanism seems quite simple, it also involves the interpretation and the conversion of sarcasm, the jargon words used in the posted comments, so as to be as accurate as possible while the analysis is performed. Every 10 minutes in a day, the price of the Snickers stick was changed, adding up to a total of 5,000 price changes over a five-week period. Those who wanted to get a low price of the Snickers stick (Macleod, 2016) had only to access the website www.snickers.com and click on the "Get a Snickers" button, thus generating a unique code that they were able to use at any store in the 7-Eleven chain of stores throughout Australia. The price could not fall (Pearce & Derepas, 2017) more than 82% of the price displayed on the shelf, because there were even attempts when the Internet users tried to artificially reduce the price, although they had not been stressed by political, economic or even by the news related to the weather. But still the campaign did a roaring trade (Lewington, 2017), over 6,000 coupons were activated, and in terms of media coverage, over 30 million posts, the traffic in social media increased by 1740%, and the sales increased by over 65%. The success of this campaign (Shaw, 2018) prompted Mars to adopt it on the American market, even two years in a row.

Figure 2. Hunger^{ithm} Campaign

Source: https://www.mediacom.com/en/work/hungerithm

Another edifying example is the campaign initiated (Marc, 2019) by Walmart, which was also launched on the occasion of SuperBowl, but which did not appeal to famous actors, as most companies resort to and which involves huge budgets just for using the VIP image only for the famous and iconic cars (Sanjoy, 2019) from older or newer films. Although most of the advertisements made and launched (Redfern, 2019) by the big retail chains are usually boring and they mainly convey the same messages such as the most diversified offer and the lowest prices, Walmart has tried and managed to get out of the ordinary patterns and to differentiate and even more to address a much broader market segment, that is, starting with those in the Baby Boomers generation, continuing with the X generation, millennials and even ending with the Z generation. The battle (Benjamim, 2019) is for shopping online for groceries and bakery products, considering that in the last 5 years it has doubled and it is estimated that by 2023 it will grow even 4 times.

The advertising campaign was designed by Publicis Groupe, resulting in a wonderful 90-second spot that can be considered both magical and nostalgic, even for the future. As of January 2019, (Sweeney, 2019) it gathered over 6 million views on YouTube. The brilliant marketing idea (Weiss, 2019) was the use of these generic vehicles that were to be instantly recognized by the audience, presenting an existing service, through its ease, speed and convenience, even why not, a new way of shopping on the way home, to work, or when taking children to or from school. The following vehicles can be listed (Capparella, 2019): "Tour Jeep" from the movie "Jurassic Park", the famous "Mystery Machine" known both from the Scobby Doo cartoons and from the two films, "Mutt Cutts van" used in the movie "Dumb and Dumber", "Wagon Queen Family Truckster" family car that appeared in the feature film "National Lampoon's Vacation", the unreleased "The Batmobile" from the Batman movie series, "ECTO-1" which was the preferred means of transport for the "Ghostbusters" team, "KITT" from the series "Knight Rider" in which the main role is played by David Hasselhoff, "Flintmobile" the vehicle that can be seen in both cartoons and the movie "The Flintstones", the fantastic "The DeLorean" car. Which has the ability not only to fly, but also to

travel in time in the "Back to the Future" hit series, and even the "Bumblebee" friendly bus from the series of very successful films "Transformers" can be seen. Although it has not appeared in any series or film, the car of the Walmart founder Sam Walton, the Ford F-150, could not be missed.

What is even more interesting is that this campaign is targets both adults and children, since they use vehicles or cars that can be Seen in movies or serials, in cartoons or stories, such as the buggy in the cartoons "Cinderella", which is prepared by a Walmart employee who places a pumpkin on a parking lot and it turns into a wonderful coach. In the Disney / Pixar films, we find the "Lightning McQueen" in the feature film and also in the "Cars" series. All of these film productions were mostly Box Office movies. The message that was wanted to be transmitted is that no matter the model or type of car you drive, you can do online shopping, and after placing the order, you can come by the car to pick them up, thus easing and reducing the time spent in the store and among the shelves. A kind of drive-thru is a concept that was launched in 1930 in the United States and has since been adapted and adopted by other countries. In Romania too, there are hardware stores as well as hypermarkets such as Cora.ro that have implemented such a system.

The third case study presented has as central theme (Clayton, 2019) not the launch of a wonderful new product or service, traditional or unconventional, but especially the awareness of parents about the dangers their children are exposed to when they go to school, especially in America and more precisely, it was intended to sound an alarm signal for changing the attitudes toward violence and gun control. The scenes are filmed in a school where different children are happy to start the new school year. A boy is proud of the new backpack purchased by his parents; a girl is very excited about the new folders that will help her stay organized. A boy enjoys listening to new headphones, and when he puts them over his ears, he does not hear how other colleagues scream and run out of the room. A boy, running down the hall, is fascinated by the new shoes that are exactly what he needed for the new school year, and in the next sequence, he rushes when he hears a gunshot behind him and a colleague falling on the floor.

Figure 3. Walmart campaign

Source: https://www.ispot.tv/ad/Iq7E/walmart-grocery-pickup-famous-cars-bumblebee-song-by-gary-numan

A schoolgirl ties the handles of a door with her jacket, stating that it is an object you must have. A red-haired boy praises his new skateboard, which is beautifully painted, but he uses it to break a window through which he can jump with his colleagues. In another room, you can see two children holding something in their hands, the girl, a pair of scissors and the boy, two pencils, and the two have adopted an attacking position, saying that these objects are very useful when it comes to fine arts. The most explicit framework is given by two girls hiding behind a wall, as can be seen in Figure 4, in which one of the girls pulls out a sock to use it as a tourniquet to cover the wound and stop the bleeding in her colleague's leg. The ending can be considered triumphant, where a little girl uses the phone to communicate with her mother, from what seems like her last moments she tries to convey that she loves her, and after this moment, the door opens and then it is quiet...

This spot was aired (Ross, 2019) along with the message: "What Objects Do You Need to Have to Survive this School Year #BackToSchool Essentials?"

Figure 4. #BackToSchool Essentials

Source: https://www.abc.net.au/news/2019-09-19/sandy-hook-foundation-releases-survive-the-school-year-ad/11528356

The ad was created by Sandy Hook Promise and its director, Nicole Hockley, is the mother of a boy who was the victim of the gunfire in Newton when 20 children were killed. Although the advertisement was criticized even by a boy whose brother was killed by gun violence in a school, a question that arises is that whether the problem is or not presented and shown in its purest form, it does not mean that it has disappeared or does not exist.

3. Conclusions

Organizations, whether they are profit or non-profit, in order to get the message transmitted in the form of a spot to be viewed and to lead to a change in behaviour, must have recourse, as we have presented, not only to the VIPs, or the cars they drive in feature films, or launch campaigns on the occasion of SuperBowl, but also send impact messages that reflect the reality on which some do not want to raise awareness. The spot created by Sandy Hook Promise managed to gather, in just a

few days (Graham & Pramuk, 2019), over one million views on YouTube alone. In 2016 (Bellware & Spectator, 2019), a spot titled "Evan" was released, which had over 11 million views on YouTube and won numerous awards including the Cannes International Festival of Creativity award, with a similar message. And the way the message is presented, once again, demonstrates that organizations need to get out of routine if they want to be successful and raise awareness, change attitudes, behaviours and why not, even organic or perhaps fundamental laws. Good intentions are not always considered and accepted by users. The organizations, most of the times, have noble goals, besides the increase in sales and the incorporation and elaboration of elements of corporate social responsibility, as was the case of the Gillete brand of the P&G company, which wanted to launch a #MeToo campaign. But sometimes good intentions can have an unwanted setback, and they can even lead to a drop in sales.

References

[1] Alpopi, C., Burlacu, S., Iovițu, M. (2018). Procesul de globalizare şi politicile ecologice. In: *Competitivitatea şi inovarea în economia cunoaşterii*, 2, 28-29 septembrie 2018, Chișinău, Republica Moldova: Departamentul Editorial-Poligrafic al ASEM, 2018, pp. 317-324. ISBN 978-9975-75-931-1.

[2] Bellware, K., & Spectator, H. (2019). *Parents of the Sandy Hook school massacre made a back-to-school PSA. This will give you chills, The video is the latest instalment of anti-violence PSAs the group releases each year*, https://www.therecord.com/news-story/9605175-parents-of-the-sandy-hook-school-massacre-made-a-back-to-school-psa-this-will-give-you-chills/.

[3] Benjamim, (2019). *Walmart Grocery Pickup Commercial Features Classic Movie Cars*, https://www.vorbly.com/marketing-blog/walmart-grocery-pickup-commercial-features-classic-movie-cars.

[4] Blythe, J. (2009). *Key Concepts in Marketing*. London: SAGE Publications Inc.

[5] Bodislav, A. D., Rădulescu, C. V., Moise, D., & Burlacu, S. (2019). Environmental Policy in the Romanian Public Sector. *The Bucharest University of Economic Studies Publishing House*, 312.

[6] Bran, F., Alpopi, C., & Burlacu, S. (2018). Territorial Development-Disparities between the Developed and the least Developed Areas of Romania. *LUMEN Proceedings*, 6(1), pp. 146-155.

[7] Burlacu, S. (2015). Violence in the health sector and social organizations in România. In *Proceedings of Administration and Public Management International Conference*, 11(1), pp. 69-83. Research Centre in Public Administration and Public Services, Bucharest, Romania.

[8] Capparella, J. (2019). *The 12 Iconic Movie Cars You Missed in Walmart's Super Bowl Commercial*, https://www.caranddriver.com/news/g25768554/walmart-commercial-movie-cars-golden-globes/.

[9] Carra, C., Burlacu, S., & Faggianelli, D. (2016). Violence within organizations in the health and medico-social sectors, comparative analysis France-Romania. *Administrație și Management Public*, (27), p. 123.

[10] Carra, C., Burlacu, S., & Faggianelli, D. (2018). Violence within the organizations of health and medico-social sector. a comparative analysis of France and Romania. *Economics, Management and Financial Markets*, 13(3), pp. 185-202.

[11] Carra, C., Burlacu, S., Faggianelli, D. (Oct. 2017). Violence in health organizations in Romania. The 13th Administration and Public Management International Conference. *Policy And Organizational Change In Public Institutions*, București, România.

[12] Clayton, A. (2019). *Sandy Hook group releases 'hard to watch' school shooting awareness video*, https://www.theguardian.com/us-news/2019/sep/18/sandy-hook-group-releases-hard-to-watch-school-shooting-awareness-video.

[13] Faggianelli, D., Burlacu, S., & Carra, C. (2018). Victimization of health professionals in bucharest service relations and social work relationships. *Administrație și Management Public*, (30), pp. 109-126.

[14] Graham, M., & Pramuk, J. (2019). *Grim 'Back to School' ad portraying kids in a mass shooting is biggest PSA yet from Sandy Hook Promise*, https://www.cnbc.com/2019/09/19/sandy-hook-promise-back-to-school-ad-gets-over-1-million-youtube-views.html.

[15] Green, R. (2017). *Clemenger Bbdo Melbourne's 'Hungerithm' For Snickers Makes Cannes Titanium Lions Shortlist*, https://campaignbrief.com/clemenger-bbdo-melbournes-hung/.

[16] Hackley, C. (2005). *Advertising and Promotion, Communicating Brands*. London: SAGE Publications Inc.

[17] https://www.dtcollective.org.au/awards/case-studies/hungerithm.

[18] https://www.ispot.tv/ad/Iq7E/walmart-grocery-pickup-famous-cars-bumblebee-song-by-gary-numan.

[19] https://www.mediacom.com/en/work/hungerithm.

[20] Keane, L. (2018). *Campaign of the Month: Snickers – You're not you when you're hungry*, https://blog.globalwebindex.com/campaign-of-the-month/snickers/.

[21] Lewington, R. (2017). *Snickers 'Hungerithm' bases 7/11 prices on internet's mood*, http://www.digitaltrainingacademy.com/casestudies/2017/08/snickers_hungerithm_bases_711_prices_on_internets_mood.php.

[22] Macleod, D. (2016). *Snickers Hungerithm*, http://theinspirationroom.com/daily/2016/snickers-hungerithm/.

[23] Marc, (2019). *WATCH: Walmart ad brings Bumblebee, Jurassic Park, Batman, Back to the Future, Knightrider and Ghostbusters together*, http://www.followingthenerd.com/movies/watch-walmart-ad-brings-bumblebee-jurassic-park-batman-back-to-the-future-knightrider-and-ghostbusters-together/.

[24] Pearce, M., & Derepas, M. (2017). MARS Australia: Hungerithm – The angrier the Internet, the cheaper the Snickers, https://www.warc.com/content/paywall/article/mars_australia_hungerithm_the_angrier_the_internet_the_cheaper_the_snickers/112176.

[25] Pricop, L. C., Burlacu, S., & Demeter, M. L. (2016). Managing violence in health sector through bi solutions. In *Proceedings of the International Management Conference*, 10(1), pp. 512-519. Faculty of Management, Academy of Economic Studies, Bucharest, Romania.

[26] Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2018). Demographic explosion and it governance in public institutions. *Managerial Challenges of the Contemporary Society. Proceedings*, 11(1), p. 18.

[27] Rădulescu, C. V., Dobrea, R. C., & Burlacu, S. (2018). The business management of distress situations. The 12th international management conference *Management Perspectives in the Digital Era*, November 1st-2nd, Bucharest, Romania, 1, pp. 741-747.

[28] Redfern, J. (2019). *This amazing advert is packed with famous cars from Hollywood history*, https://www.motoringresearch.com/car-news/walmart-famous-cars-advert-stars-of-hollywood/.

[29] Ross, J. (2019). *Sandy Hook Promise's Shocking 'Back to School' Ad Is Hard to Watch*, https://www.thedailybeast.com/sandy-hook-promises-shocking-back-to-school-ad-is-hard-to-watch?ref=scroll.

[30] Sanjoy, A. (2019). *Batmobile to Bumblebee, the Walmart Commercial is Packed with Movie Cars!*, https://www.thesupercarblog.com/famous-movie-cars-batmobile-bumblebee-the-walmart-commercial-grocery-pickup/.

[31] Shaw, K. (2018). *Snicker's Brings Back Clemenger Bbdo Melbourne's Award-Winning 'Hungerithm' Promotion At 7-Eleven Stores In The US*, https://campaignbrief.com/snickers-brings-back-clemenger/.

[32] Stanley, T. L. (2017). *How Snickers Used Social Media Outrage to Fuel the Year's Most Innovative Media Plan, Its hunger algorithm drove the candy's price*, https://www.adweek.com/creativity/media-plan-of-the-year-best-in-show/.

[33] Sweeney, E. (2019). *Walmart's famous cars Golden Globes ad racks up 8K mentions, analysis finds*, https://www.marketingdive.com/news/walmarts-famous-cars-golden-globes-ad-racks-up-8k-mentions-analysis-finds/545464/.

[34] Weiss, J. (2019). *Walmart sd uses genre's most famous cars to promote New Grocery Pick-Up Service*, https://www.syfy.com/syfywire/walmart-ad-uses-genres-most-famous-cars-to-promote-new-grocery-pick-up-service.

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Convenience Stores in Romania. What Has Changed after the COVID-19 Outbreak?

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Abstract

Purpose - The purpose of this paper is to identify the main attributes that are defining the new convenience in Romanian modern grocery retailing after COVID-19 outbreak.

Design/methodology/approach – The literature review is presenting the general description for convenience stores. The paper also presents the context of Romanian modern grocery retailers for 2019 and the current context, the changes caused by COVID- 19 outbreak. In the end, conclusions are presented.

Findings – The new convenience is reflected by the changes resulting from the imposed safety measures, which mean utilitarian needs accomplished, in a fast time and a safe manner, and these can be done by transparent communication.

Research limitations/implications – The paper is conceptual, so future research will be necessary to empirically validate these findings.

Originality/value - This study is an important instrument for further research and for retail managers. It offers a valuable response to what convenience stores should do to meet customers' new expectations.

Keywords: convenience stores, modern grocery retailers, COVID-19 outbreak.

JEL Classification: L81, M31

1. Introduction

Convenience stores in modern retail in Romania reflect an upward trend in line with trends in developed countries. Increasingly busy consumers choose to shop quickly, close to their home, their office or close to their children's school. After the declaration of the state of emergency on March 11th, 2020, the purchasing and consumption behaviour underwent substantial transformations and in the context of a poorly implemented e-commerce for groceries, people increasingly turned to convenience stores, the term convenience gaining new dimensions. The new context has led to a rapid adaptation to new consumer demands and a change

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in marketing strategy. Customer loyalty and the way customers choose to patronize a store depend on the promptness with which the retailer responded to the new demands, the integrated marketing communication strategy playing an essential role.

2. Problem Statement

Convenience stores general description by literature review

First developed in the USA and then in Japan, the convenience store format is characterised as a small-scale store, with an assortment of daily necessities and an extensive open hours. The development of this format was based on logistical efficiency connected to IT progress. The change in lifestyle, the increase in population density, the number of persons in a household, in close connection with the increase in the number of professionally active women (full time) responsible for household management, have led to the growth and development of this format (De Kervenoael, Hallsworth and Clarke, 2006), (Seiders, Berry and Gresham, 2000).

For defining the convenience format, the literature emphasises common elements given by the attributes that make the shopping experience easier, effortless in terms of time efficiency. So, we are talking about physical attributes (surface, assortment, layout, location, open hours), but also about the multitude of services that make the shopping experience more convenient.

According to Guberman (1971), the modern convenience store is a miniature supermarket, but it indicates that the definition of the store should be based mainly on its operation and not on its size. Baron, Leaver and Oldfield, (2001) describe it as a store of approximately 280m^2, in a location close to the customers' homes, which has a "wide and superficial" range of products. Convenience is expressed in various ways, such as long hours of operation (open at least 16 hours a day, six and even seven days a week) and a self-service approach that gives speed to shopping. Its range of products covers the urgent needs and impulse purchases of the inhabitants in the area (Jones, 1986). The most popular products sold in these stores are tobacco, alcohol and dairy beverages (Kirby, 1976). A convenience store can also supply food, vegetables, fresh fruit, frozen products, fast food, household goods and newspapers (Jones, 1986). Prices seem higher on average than in supermarkets and there is also a limited variety of "healthy foods" (Guy, 2004; Liese et al., 2007).

The main reason for creating these store premises is the intention of consumers to achieve a high level of quality, convenience and service, combined with an efficient use of time spent on their purchases (Kirby, 1976; Crafton, 1979; Brown, 1989; Reimers and Clulow, 2001). It has been estimated that the average time a consumer spends in a convenience store is three to four minutes (Brown, 1989). Another important factor is customers' reluctance to cover long distances for shopping (Lorch and Smith, 1993). These stores meet the need for small, well-organized neighbourhood stores that are considered supplements for large

retail stores and satisfy consumers with basic needs (Kirby, 1986). Since their appearance in Texas in 1927 (Kirby, 1976), considerable attention has been paid to the development of convenience stores in the US retail market (Morganosky, 1997).

Romanian general context

According to Euromonitor (2020), in 2019, Romanian grocery retailers continued to dominate the retailing landscape. Several trends drove an increase in sales; including the growing interest in health and wellness, and an increasing demand for convenience. With consumers having increasingly busy lifestyles, their changing habits and higher incomes increased the demand for convenient shopping solutions – such as close proximity, dedicated selling areas for healthy food and ready meals, and time-saving solutions such as e-commerce, and mobile e-commerce. As the health and wellness trend gains more influence, more manufacturers are offering organic, preservative-free and natural healthy food and on-the-go meals and retailers have launched their own to-go private labels in these areas, thus improving access to a broader range of products, across the country. The expansion of modern retailing provided benefits to both consumers and retailers - while consumers benefited from a more extensive array of goods, from economy to premium health foods, retailers benefited from accessing new areas of the country, promoting their private label ranges and stores in these areas. Modern grocery chains also attract price-sensitive consumers, which account for a large majority of the population. The hardship of times experienced in the 1990s, and then in 2010, resulted in many Romanians habitually hunting for low prices, deals and bargains. Modern grocery retailers meet these demands, offering low priced private label ranges and regular promotions and discounts.

Proximity shopping was a key development for convenience stores in 2019, with aggressive expansion strategies resulting in the lockout of some local traditional small independent grocers. Many of these small independent stores failed to compete with the new competition and lost share – particularly in large cities. However, where small independent grocers lost share against modern retailing, it was mainly because of the focus on the sales of packaged food, whereas many maintained an essential position in sales of unpackaged products. This was particularly the case for specialised stores that benefited from a strong turnaround for making a difference, with many selling traditional products such as chilled processed meat and cheese.

The international grocery retail chains that are operating in convenience store format in Romania are Profi, Mega Image, Carrefour and Auchan.

Rural shopping remains underdeveloped and dominated by small independent grocers, but a movement is seen to the opening of convenience stores such as Profi Loco, La Doi Paşi and CBA. When looking to large cities, but also to secondary towns, modern retailing dominates and the offer of commercial premises is strong.

3. Research Questions / Aims of the Research

The aim of this paper is to identify the main attributes that are defining the new convenience stores in the Romanian modern grocery retailing after the COVID-19 outbreak.

The COVID-19 outbreak is still producing effects and in the near future an economic crisis is imminent as is predicted by experts. The retail sector was deeply affected, especially in the non-food area, which operated in Romania only online, as during the state of emergency all stores were closed except for groceries.

4. Findings

For grocery retail, change was very dynamic and not for all predictable or similar with previous crises, as this time COVID-19 caused a pandemic with disruptions in the global supply chain.

Table 1 is presenting the main changes in the Romanian grocery shopping during pandemic based on data published by GfK Consumer Panels & Services report (first quarter, 2020) and EY online study carried out on 393 participants during May 13th to June 2nd, 2020, including 25 questions related to the isolation period behaviour and next future possible changes.

Table 1. What has changed after COVID – 19 outbreak

household spending per consumer goods	rose by almost 14% in the first quarter of 2020, compared with the same period of last year
private brands	gained ground ahead of national brands and came to cover 21% of total sales
stocks (volume of purchasing per households)	11% increase in the amounts of consumer goods purchased, compared to the first quarter of 2019
favourite formats	Romanians turned to proximity stores, with modern small shops and discount stores thus registering the largest increases
quality of products	the largest increase in importance during the pandemic, of 66%, followed by price
type of products	with a migration to local products to the detriment of imports
new expectations	safety measures in stores, cleaning and disinfection; useful information, not only commercial actions taken by retailers during pandemic
need for digitalization	poor implemented e-commerce, less than 1% from total sales

Source: based on data published by GfK Consumer Panels & Services (2020), EY (2020)

The COVID-19 epidemic produces various effects at global level, considering the different degree of spread of the virus in the affected countries and its different evolution. But the usual activities and the dynamics of consumption have been similarly disrupted throughout the planet. Thus, we can notice patterns in the Romanian consumer close to those of consumers in developed markets such as the USA, the United Kingdom, France, or Germany (Cârstoiu, 2020). The poor implementation of e-commerce, especially for fresh products made the proximity stores the most convenient for quick and safe shopping.

Modern grocery retailers have adjusted their brand communication, moving from commercial to information and support, choosing social media as the main communication channel. This was an opportunity to humanize the brand and prioritize relationships with customers and with their own employees too. For instance, the top 3 engagement theme posts on Facebook were related to thanks for the front-line employees, safety measures in stores or the mobilization to provide support to hospitals and vulnerable people (Strătilă & Mehedințu, 2020).

5. Conclusions

Compared to the set of concept and with the trends of 2019, the new convenience stores are rather related to safety, which could mean utilitarian needs accomplished, quickly and in the proximity, which suppose not out of stock caused by supply chain disruptions. Own brands and local producers offer could be the strategy for patronizing, attracting new customers, with good quality and price offers, saving costs and getting sustainable competitive advantage. Digitalization, operating omnichannel, in store technology and increasing engagement by leveraging social media are closely connected to convenience and timeliness, in order for customers to get information in due time and make the shopping experience easier, which now means safely, by avoiding spending too much time inside public agglomerations. Safety is also closely related to transparency and accuracy, thus the communication should focus more on the utilitarian aspect.

The paper is conceptual. So, in the near future, a research is needed to empirically validate these findings. The research objective will be related to the implications on the marketing strategy of convenience stores as a consequence of the imposed safety measures.

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References

[1] Baron, S., Leaver, D., & Oldfield, B. M. (2001). Beyond convenience: the future for independent food and grocery retailers in the UK. *The International Review of Retail, Distribution and Consumer Research*. 11(4), pp. 395-414.

[2] Brown, L. G. (1989). The strategic and tactical implications of convenience in consumer product Marketing. *The Journal of Consumer Marketing*. 6(3), pp. 13-19.

[3] Cârstoiu, C. (2020). *Cum a modelat COVID-19 comportamentul consumatorilor români?* Retrieved from https://www.ey.com/ro_ro/covid-19/comportamentul-consumatorului-roman-in-contextul-covid-19-.

[4] Crafton, S. M. (1979). Convenience store pricing and the value of time: a note on the Becker-Devany full price model. *Southern Economic Journal*. 45(4), pp. 1254-1260.

[5] De Kervenoael, R., Hallsworth, A., & Clarke, I. (2006). Macro-level change and micro level effects: A twenty-year perspective on changing grocery shopping behaviour in Britain. *Journal of Retailing and Consumer Services*, 13, pp. 381-392.

[6] Euromonitor (2020). Retailing in Romania – Analysis. *Country Report*.

[7] GfK (2020). *GfK Consumer Panels & Services Report*, 1st Quarter 2020.

[8] Guberman, R. (1971). Convenience stores: past and present. *Journal of Food Distribution Research*, 2(2), pp. 36-37.

[9] Guy, C. (2004). Neighbourhood retailing and food poverty: a case study in Cardiff. *International Journal of Retail & Distribution Management.* 32(12), pp. 577-581.

[10] Jones, P. (1986). The development of convenience stores in Britain. *The Service Industries Journal.* 6(3), pp. 392-398.

[11] Kirby, D. A. (1976). The convenience store phenomenon: the rebirth of America's small shop. *Retail & Distribution Management.* 4(3), pp. 31-33.

[12] Kirby, D. A. (1986). Convenience Stores: The polarisation of British retailing. *Retail and Distribution Management.* 14(2), pp. 7-12.

[13] Liese, A. D., Weis, K. E., Pluto, D., Smith, E., & Lawson, A. (2007). Food store types, availability, and cost of foods in a rural environment. *Journal of the American Dietetic Association.* 7(11), pp. 1916-1923.

[14] Lorch, B., & Smith, M. (1993). Pedestrian movement and the downtown enclosed shopping center. *Journal of the American Planning Association*, 59, pp. 75-84.

[15] Morganosky, M. A. (1997). *Format change in US grocery retailing. International Journal of Retail & Distribution Management*, 25(6), pp. 211-218.

[16] Reimers, V., & Clulow, V. (2001). When it comes to convenience, it's not the consumer who's confused. *International Journal of Customer Relationship Management*, 3(4), pp. 333-348.

[17] Seiders, K., Berry, L. L., Gresham, L. G.(2000). Attention, retailers! How convenient is your convenience strategy?? *Sloan Management Review*, 43(3), pp. 79-89.

[18] Strătilă (Irimia), A., & Mehedințu, M. (2020). The Impact of COVID-19 Pandemic on Romanian Modern Grocery Retailers. *ETIMM 2020 Conference, unpublished*.

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Using a Digital Platform to Support Market Research for SMEs

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Abstract

Small and medium-sized enterprises (SMEs) are the backbone of a national economy. To survive and thrive, they must adopt a market orientation. This process involves collecting market information related to customers, competitors, and using it in the decision-making process.

Such information can be gathered both formally through market research and informally from personal and business networks. However, few SMEs use formal market research because they do not have the necessary resources, such as money, skills, or even time. With the advent of digital technologies and to compensate for the shortcomings, new digital tools can be used. This study investigates the extent to which SMEs are interested in using a digital platform to perform market research activities. Data were collected from 403 organizations through a CAPI survey and were analysed using cluster analysis. The results indicate that only 6% of SMEs perform market research, while 18% intend to do it soon. We identified four clusters with distinct behaviours and valuable findings related to digital platform characteristics to increase the adoption rate.

Keywords: SMEs, digital platform, market information, market orientation.

JEL Classification: M31, L20, O33

1. Introduction

Small and medium-sized enterprises (SMEs) are a major player in the economy, an agent of innovation, an important creator of new jobs, and added value. For instance, in the EU, SMEs are 99.8% of all companies, employ 65% of the workforce, and generate 53% of total turnover (Muller et al., 2020). Similarly, in

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Romania, SMEs are 99.7% out of total enterprises, hire 65% of employees, and generate 58% turnover (European Commission, 2020a).

Compared to larger firms, SMEs are encumbered by liabilities of smallness and market entry barriers, difficulties in raising capital, recruiting, and training the workforce, and meeting governmental requirements to taxation and regulation (Aldrich & Auster, 1986). Nevertheless, they manage to survive and thrive in such adverse conditions. Several theories have been developed over time to explain how companies grow over time. One of them explains the superior performance by the market orientation of the companies (Raju, Lonial, & Crum, 2011), which implies identifying customer needs and offering products tailored to them. This orientation is based on collecting information about current and future customers' needs, dissemination between the company's departments, and the organization's response (reaction) to them (Kohli & Jaworski, 1990).

2. Literature Review

A market orientation summarizes the essence of the marketing concept and is a business philosophy that focuses on effectively creating superior value for customers. It is based on three dimensions: customer orientation, which involves understanding their needs, competitor orientation, which means knowing their strengths and weaknesses, and cross-functional coordination, which involves the coordinated use of resources to create value for the customers (Narver & Slater, 1990). Therefore, it is based on managing information about customers and competitors. Previous research indicates that SMEs' most important information is about customers' needs and behaviour, competitors' activities, and new production technologies. To a lesser extent, they are interested in regulatory information, suppliers, and the macroeconomic environment (Moraes, Pimentel, & Spinola, 2013). Unfortunately, SMEs have problems accessing specific information; the quality of some information is low – outdated and inaccurate - and the cost to obtain certain data is high (Leonidou, 2004).

For SMEs, knowledge acquisition is more important than knowledge creation because they have limited capabilities (Bratianu, Prelipcean, & Bejinaru, 2020). Knowledge acquisition is about identifying external knowledge that is important to the firm's operations (Saad, Kumar, & Bradford, 2017). This acquisition can be done in three distinct ways: through social capital - that is part of the relationships at the individual or organizational level, by scanning the environment or purchasing knowledge (Hock-Doepgen, Clauss, Kraus, & Cheng, 2020). According to previous studies, the first method is the preferred one. SMEs rely heavily on their social networks made by family, friends, customers, suppliers, and even competitors to gather information (Costa, Soares, & de Sousa, 2016). This approach seems well adapted to these companies' organic structures that use personal contacts to manage a significant amount of information simply and informally (Alvarez, Zamanillo, & Cilleruelo, 2016).

Scanning the environment is the second method used by SMEs to gain knowledge and consists of environment surveillance by searching and collecting

information about events and changes outside the company. This process is somewhat situational and reactive and strongly influenced by owner-managers' skills and attitude (Moraes et al., 2013).

The third method to acquire knowledge is to purchase it. SMEs buy the information that is gathered through formal market research, not necessarily knowledge. As previously mentioned, SMEs consider this method expensive and complicated and can only be performed by specialized people (Venkatesan & Soutar, 2001); therefore, they tend not to use it.

Regardless of the method used, it is not enough only to collect information. Companies must convert and apply it in internal business processes to generate superior performance (Lee & Lan, 2011). It has been shown that knowledge management directly influences a company's financial performance (Moraes et al., 2013), its ability to innovate (Lee, Foo, Leong, & Ooi, 2016), (Costa et al., 2016), to strengthen its position on the internal market (Alvarez et al., 2016), and to expand on the international market (Leonidou, 2004), (Santoro, Mazzoleni, Quaglia, & Solima, 2019).

Although we know that SMEs avoid expensive and complicated methods of gathering information in general, we do not know to what extent the adoption of new digital technologies - which reduce costs and simplify use (Hosseini, Fallon, Weerakkody, & Sivarajah, 2019) - can change their behaviour.

Digital technologies are an important driver of a company's digital transformation. This process has put huge pressure on traditional companies and has impacted many functional areas such as marketing, operations management, information systems, and innovation. There are three distinct phases in this process, namely: digitization, digitalization, and digital transformation (Verhoef et al., 2019). SMEs lag behind large companies and previous studies indicate that they are in the second stage, namely digitalization (Eller, Alford, Kallmünzer, & Peters, 2020).

3. Research Questions / Aims of the Research

This study aims to investigate SMEs' current and future knowledge acquisition behaviour through formalized market research. As previous studies suggest, market orientation is a strategic orientation highly correlated with the company's financial and non-financial performance. Companies that adopt this orientation rely on information, which can be collected in several ways. Given the high costs and complexity, SMEs do not prefer formal market research for information acquisition. Therefore, we have the following research objectives:

- to identify if SMEs allocate financial or human resources for marketing activities;
- to measure the importance of different types of information;
- to find out the percentage of SMEs that have used formal market research;
- to see if SMEs intend to conduct market research shortly.

Some SMEs have started to adopt digital tools and technologies to carry out different business processes. That is why we have an additional set of research objectives:

- to find out how many SMEs intend to use a digital platform for managing their market research activities;
- to identify the functionalities that such a platform must have.

4. Research Methods

To address these research objectives, we conducted a quantitative study using a survey. Data collection was done by the personal interviewing method at the company's headquarters, between March 6th and March 16th. Between March 16th and March 23rd, given the restrictions imposed by the SARS-CoV-2 pandemic, the data were collected by telephone (CATI). The questionnaire was reviewed by two university academics to increase face validity and pre-tested. Comments on questions and wording were considered for the final questionnaire to improve comprehensibility.

The analysis unit is the SME, an enterprise with less than 250 employees from various industries. The respondents are entrepreneurs or managers of these enterprises. We must mention that, according to the European Union definition, even an association may be considered an enterprise if it is engaged in an economic activity (European Commission, 2020b). Given that many professional/business associations offer paid services to their members, we decided not to exclude them from the survey. A quota sampling procedure was employed to reflect the SMEs' structure in Romania by size and industry (see Table 1. Characteristics of respondents). Data collected from 403 respondents (58% response rate) were processed and analysed using the IBM SPSS® Statistics software.

Table 1. Characteristics of respondents

	Frequency	**Percent (%)**
Size (no. of employees)		
Micro (0-9)	343	85.1
Small (10-49)	49	12.2
Medium (50-249)	11	2.7
Total	**403**	**100.0**
Industry		
Wholesale and retail trade	101	25.1
Services (real estate, leasing, administrative)	81	20.1
Professional/business associations	64	15.9
Manufacturing	46	11.4
Accommodation and food service activities	37	9.2
Transport and storage	30	7.4
Construction	24	6.0
Professional services (legal, accounting, management, architecture, engineering)	16	4.0
Education	4	1.0
Total	**403**	**100.0**
Age (years)		
0-3	91	22.6
4-9	175	43.4
10-20	114	28.3
Over 20	23	5.7
Total	**403**	**100.0**

After importing the data into IBM SPSS® Statistics, a data check and data cleaning were performed to eliminate data-entry errors and identify outliers. Subsequently, depending on the type of scale used, the data were transformed (converted from nominal variables to metric variables and vice versa), and some new variables were calculated. The analysis applied basic statistical methods, such as frequencies distribution and crosstabs. Multivariate cluster analysis using a two-step clustering procedure was also used to identify distinct groups of SMEs regarding market research behaviours.

5. Findings

Results indicate that only 16.1% of SMEs allocate resources (people, money, time) for marketing activities, considering the first research objective. Therefore, we consider such companies to have a marketing orientation. The problem is that a high percentage of respondents (43.2%) answered that they did not know, which suggests that they avoided answering these questions, as they considered that a negative answer would be undesirable.

It is interesting to see which SMEs have or do not have a marketing orientation. Thus, we found an association between marketing orientation and industry: construction companies and professional/business associations allocate resources for marketing activities compared to companies in manufacturing, services, tourism, and trade. It seems that those companies which have direct contact with customers are not allocating dedicated resources for marketing. Although the results are surprising, they are statistically significant, with a contingency coefficient of 0.358.

Another interesting association was found between the company's size and age on the one hand and marketing orientation, on the other hand. Larger and older companies allocate more resources for marketing activities than smaller and newer organizations.

Considering the second research objective, we measured the importance of different information (about customers, competitors, business partners, market, industry, economic environment, socio-cultural environment, technological environment, and political environment). The variables were converted into metric variables on a scale from 0 - unimportant, 1 - less important, 2 - important, 3 - quite important to 4 - very important. All types of information have the same importance for SMEs (mean value varies between 2.00 for business partners and 2.11 for customers). Afterward, we converted the final score from a metric variable to a nominal variable as follows: if the value was between 0-1.99, we assigned low importance, and for a value higher than 2, high importance. We then tested to see if there was an association between the importance of information for an organization and the extent to which it has a marketing orientation. We found that almost 50% of companies that assign high importance to information have a marketing orientation, while only 5% of those who consider that information has low importance have a marketing orientation. The association is statistically significant,

and the contingency coefficient is 0.473. The importance of information is also correlated with the probability of doing market research.

Regarding the third research objective, we found that only 6.5% have conducted market research in the last three years, while the 93.5% did not, for several reasons: they do not need market research (47.6%), do not have resources – such as money, skills, time (28.8%) or do not believe in them (17.1%).

There is a moderate correlation (Pearson correlation coefficient = 0.37) between the importance of information and market research. Like the marketing orientation, we found that the larger the company, the greater the chances of conducting market research.

Micro-enterprises do not use market research because they consider that they do not need it, while small enterprises declare that they do not have resources for such an activity.

If we analyse who are the organizations that have conducted market research in the last three years, we find that the most active organizations are professional associations, followed by companies in manufacturing, construction, and transport.

Surprisingly, companies in trade and services are the most inactive ones; over 50% declare that they do not need market research.

Considering the fourth research objective, we found that 17.6% of respondents intend to use market research next year. Again, we identified an association between those who intend to carry out market research and industry, professional/business associations continuing to hold the first place, followed by companies from construction, transport, and manufacturing (contingency coefficient = 0.342, p-value<.001).

Regarding the fifth research objective, results suggest that only 58% of those who intend to use market research in the next year are willing to use a digital platform. It is interesting to mention that, again, professional/business associations are the most eager to use a digital platform for conducting market research. Then, we explore how important the information is for those who do not intend to do research, who intend to do research and use a platform, and those who intend to do research and not use a platform. The results indicate an important difference between those who do not intend to do research (score 1.79 on a scale from 0 to 4) and those who intend to do it, either with a platform (score 3.30) or without a platform (score 3.35). It is surprising that those who assign the highest importance to information do not want to use a digital platform. Maybe they are reluctant to perform - on their own - such activities, which are critical to them given the importance assigned to information. Therefore, they prefer to transfer this activity to experts.

If we analyse the company's age, we find that 26% of companies over 20 years are interested in using a platform, while only 1% of young organizations (<3 years) expressed their intention to use such a platform. The degree of association between the two variables is statistically significant, and the contingency coefficient is 0.250.

Finally, our sixth research objective was to explore the functionalities that respondents are looking for on the online research platform. Respondents had to express their agreement with nine statements (Total disagreement = 1 -> Total agreement = 5). As we can notice, the highest score was obtained by the library of templates (4.39) followed by the expertise of specialists (4.34), while the lowest score was for organizing a research from scratch (2.88). This result indicates that although respondents are willing to work with a platform, the tendency is to "transfer" to experts or – if they are to do it by themselves – to be helped with some templates. Respondents state that they trust the automated data collection and analysis software, and it is important that the results are presented in an attractive graphical form (infographics).

Finally, we explored SMEs' research behaviour, and we grouped the respondents according to three clustering variables: the importance of information, if they did market research in the past and if they intend to do it in the near future. Given that both metric and non-metric variables are used in the clustering procedure, we used a two-step clustering method. After running the clustering procedure, we obtained four groups, and the model is considered good (see Figure 1).

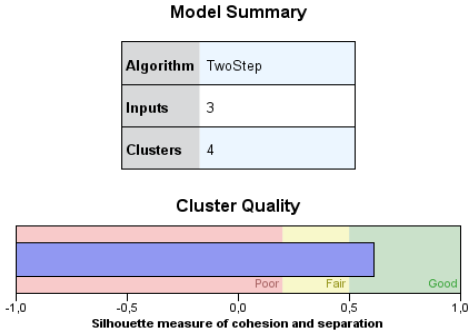

Figure 1. Clustering procedure

The ratio between the number of cases in the largest group and the smallest group is 2.46 (<3), which indicates a balanced clustering. Group 1 represents 28.8% of the total SMEs, group 2 - 17.1%, group 3 - 15.6% and group 4 consists of the remaining 38.5% respondents.

The following characterise cluster 1:

- they did not use market research because they do not have resources (time, money, skills);
- they do not intend to conduct market research in the future;
- the importance of the information is average (2.06 out of 4);
- in general, they are micro-enterprises of 4-9 years, operating in trade field.

Cluster 2 has the following attributes:

- they did not use market research because they do not believe in it;
- they do not intend to research in the next period;
- the importance of the information is average (1.76 out of 4);
- they consist of micro-enterprises with age between 4-9 years in the field of services.

Cluster 3 is made of organizations that:

- did not conduct market research because they consider they do not need it;
- however, they intend to do research;
- the importance of the information is very high for them (3.35 out of 4);
- generally, they are professional/business associations with up to 9 employees and 4-9 years old.

Ultimately, cluster 4 consists of enterprises which:

- did not do market research because they do not need it;
- do not intend to do research;
- the importance of the information is small for them: score 1.66 out of maximum 4;
- in general, there are micro-enterprises, between 4-9 years, operating in services, trade, and manufacturing fields.

6. Conclusions

This study aimed at investigating the market research behaviour of SMEs. We found that a small number of organizations (16.1%) allocate resources for marketing activities in general, and an insignificant percentage (6.5%) employ market research to acquire external information. The main reason for not using market research is that they do not need it (47.6%) or do not have available resources (28.8%). Still, there is a high percentage of SMEs which do not believe in market research (17.1%).

Surprisingly, trade and service companies are not using market research. This insight means that they use other methods of collecting external information, given the proximity to customers and the direct contact they have with them. On the other hand, professional/business associations rely on market research, followed by companies in industries that do not necessarily directly contact customers (construction, transport, and manufacturing).

Our results revealed a correlation between the importance of external information and the resources allocated to marketing activity in general and market research.

Regarding the intention to conduct market research, results indicate that only 17.6% of organizations intend to do it next year. In general, these are professional/ business associations, construction, transport, and manufacturing companies, which means that the best predictor of future behaviour is past behaviour.

Interestingly, around 60% of those who want to conduct market research would be willing to use a digital platform. The most sought-after functionalities are a library of predefined research templates, support of experts, automated software, and infographics. Respondents prefer fast and basic data analysis instead of a complex one. Only a few respondents are interested in developing their research from scratch on the platform. Moreover, if a company considers that external information is of high importance, it will transfer this activity to an expert and avoid performing it by itself on a digital platform. The vital role that professional/business associations seem to play in the marketing research process

should be mentioned. It seems that this function has been outsourced to them by companies that are members of the association.

This research has both theoretical and practical contributions. At the theoretical level, this study confirms that formal market research is not the first choice of SMEs for collecting information. Companies that are close to customers and interact directly with them consider that they do not need research, maybe because they use other alternative methods. There is also a high percentage of SMEs who do not believe in market research. Therefore, it would be interesting to know why.

At a practical level, this study reveals the crucial role of professional/business associations. To justify their existence, they must offer value-added services to their members, such as reliable, relevant, and updated market information.

Future research should focus on how SMEs combine and use the information gathered from market research to increase the company's performance.

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References

[1] Aldrich, H., & Auster, E. R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. *Research in Organizational Behaviour,* 8, pp. 165-198.

[2] Alvarez, I., Zamanillo, I., & Cilleruelo, E. (2016). Have information technologies evolved towards accommodation of knowledge management needs in Basque SMEs? *Technology in Society,* 46, pp. 126-131. doi:https://doi.org/10.1016/j.techsoc.2016.04.006.

[3] Bratianu, C., Prelipcean, G., & Bejinaru, R. (2020). Exploring the latent variables which support SMEs to become learning organizations. *Management & Marketing. Challenges for the Knowledge Society,* 15(2), pp. 154-171. doi:https://doi.org/10.2478/mmcks-2020-0010.

[4] Costa, E., Soares, A. L., & de Sousa, J. P. (2016). Information, knowledge and collaboration management in the internationalisation of SMEs: A systematic literature review. *International Journal of Information Management,* 36(4), pp. 557-569. doi:https://doi.org/10.1016/j.ijinfomgt.2016.03.007.

[5] Eller, R., Alford, P., Kallmünzer, A., & Peters, M. (2020). Antecedents, consequences, and challenges of small and medium-sized enterprise digitalization. *Journal of Business Research,* 112, pp. 119-127. doi:https://doi.org/10.1016/j.jbusres.2020.03.004.

[6] European Commission. (2020a). *Eurostat Structural business statistics (SBS) and global business activities*. Retrieved from https://ec.europa.eu/eurostat/web/structural-business-statistics/overview.

[7] European Commission. (2020b). *User guide to the SME Definition*. Retrieved from https://ec.europa.eu/docsroom/documents/42921/attachments/1/translations/.

[8] Hock-Doepgen, M., Clauss, T., Kraus, S., & Cheng, C.-F. (2020). Knowledge management capabilities and organizational risk-taking for business model innovation

in SMEs. *Journal of Business Research*. doi:https://doi.org/10.1016/j.jbusres. 2019.12.001.

[9] Hosseini, S., Fallon, G., Weerakkody, V., & Sivarajah, U. (2019). Cloud computing utilization and mitigation of informational and marketing barriers of the SMEs from the emerging markets: Evidence from Iran and Turkey. *International Journal of Information Management,* 46, pp. 54-69. doi:https://doi.org/10.1016/j.ijinfomgt. 2018.11.011.

[10] Kohli, A. K., & Jaworski, B. J. (1990). Market Orientation: The Construct, Research Propositions, and Managerial Implications. 54(2), pp. 1-18. doi:10.1177/00222429900 5400201.

[11] Lee, M.-R., & Lan, Y.-C. (2011). Toward a unified knowledge management model for SMEs. *Expert Systems with Applications,* 38(1), pp. 729-735. doi:https://doi.org/ 10.1016/j.eswa.2010.07.025.

[12] Lee, V.-H., Foo, A. T.-L., Leong, L.-Y., & Ooi, K.-B. (2016). Can competitive advantage be achieved through knowledge management? A case study on SMEs. *Expert Systems with Applications,* 65, pp. 136-151. doi:https://doi.org/10.1016/j.eswa. 2016.08.042.

[13] Leonidou, L. C. (2004). An Analysis of the Barriers Hindering Small Business Export Development. *Journal of Small Business Management,* 42(3), pp. 279-302. doi:10.1111/j.1540-627X.2004.00112.x.

[14] Moraes, R., Pimentel, A., & Spinola, M. (2013). *Environmental scanning and smes strategies: a case study.* Paper presented at the 22º International Conference on Production Research – ICPR..

[15] Muller, P., Robin, N., Schroder, J., Braun, H., Becker, L. S., Farrenkopf, J., Caboz, S., Ivanova, M., Lange, A., Lonkeu, O. K., Mühlschlegel, T. S., & Pedersen B. (2020). *Annual report on European SMEs 2018/2019: research & development and innovation by SMEs: background document*. Retrieved from http://op.europa.eu/en/publication-detail/-/publication/cadb8188-35b4-11ea-ba6e-01aa75ed71a1/language-en.

[16] Narver, J. C., & Slater, S. F. (1990). The Effect of a Market Orientation on Business Profitability. 54(4), pp. 20-35. doi:10.1177/002224299005400403.

[17] Raju, P. S., Lonial, S. C., & Crum, M. D. (2011). Market orientation in the context of SMEs: A conceptual framework. *Journal of Business Research,* 64(12), pp. 1320-1326. doi:https://doi.org/10.1016/j.jbusres.2010.12.002.

[18] Saad, M., Kumar, V., & Bradford, J. (2017). An investigation into the development of the absorptive capacity of manufacturing SMEs. *International journal of production research*, 55(23), pp. 6916-6931. doi:10.1080/00207543.2017.1327728.

[19] Santoro, G., Mazzoleni, A., Quaglia, R., & Solima, L. (2019). Does age matter? The impact of SMEs age on the relationship between knowledge sourcing strategy and internationalization. *Journal of Business Research*. doi:https://doi.org/10.1016/j.jbusres. 2019.05.021.

[20] Venkatesan, V. S., & Soutar, G. N. (2001). Market research in Australian SMEs: An empirical study. *Small Enterprise Research,* 9(2), pp. 17-31. doi:10.5172/ser.9.2.17.

[21] Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2019). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*. doi:https://doi.org/10.1016/j.jbusres. 2019.09.022.

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Romanian Consumer Behaviour and Payment Choice in Online Shopping. A Marketing Perspective

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Abstract

Nowadays, online migration is a fact, thus offering efficiency and ease-of-use to customers is a mandatory requirement for all steps within the purchasing process, starting from the moment of need recognition or creation all the way to closing the deal, thus paying for the desired products or services. In order to make this process as fast as possible, most commercial websites offer the opportunity for online payment. However, although worldwide this type of payment represents the normality, there are economies in which people are still reluctant, one of these being the Romanian market. Having this context, we have conducted a national survey on a representative sample of 4,000 respondents in order to analyse consumer behaviour and payment choice in online shopping, with focus on enhancer and inhibitor factors for card credit payment. The research results showed us that convenience and availability are the main reasons for which people are choosing online payment, whereas lack of trust still represents the main barrier. The data was collected before the Covid-19 pandemic period; thus, this research is showing a normal consumer behaviour trend for Romania, which can be taken into consideration when developing new marketing strategies for the post-pandemic recovery period.

Keywords: *online shopping, online payment, consumer behaviour, Romanian market.*

JEL Classification: *M31*

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1. Introduction

Consumer's decision-making process concerning payment choice is quite complex, that standard economic models have difficulty incorporating this complexity, therefore additional research into consumer choice of payment method is needed (Crowe et al., 2006).

This is one of the reasons for which we have focused our research on this decision-making process, in order to better understand how people are behaving in online shopping and, especially, online payments.

Payment industry participants, both suppliers and users of payment methods, are seeking legal and institutional arrangements that cultivate the best possible payment system (Crowe et al., 2006); however nothing is relevant if the consumer is not on board also. All business decisions are consumer-dependent, as they work only if the customer takes actions. Having this context in mind, is important to evaluate all 3 states of consumer behaviour – cognitive (what he/she knows about online payments), affective (how he/she feels about this payment option) and conative (what actions is he/she taking).

In order to build efficient marketing strategies for the payment industry, we have to first understand the consumer, know his/her preferences, his/her motives and, equally important, his/her fears when it comes to credit card usage in the online environment. Romania is somehow a peculiar market in terms of payment instruments, as cash is still the favourite, even for urban population.

Having this context, we have designed and conducted a quantitative research on Internet shoppers from Romania, evaluating their behaviour regarding payment choice in online shopping.

2. Problem Statement

The literature review on a topic such as online shopping is nowadays very extensive, going from general information about Internet usage all the way to the structured process in online consumer behaviour.

Online consumer behaviour is a complicated socio-technical phenomenon and has been the focus of researchers for the last decade (Reile, 2017). Understanding the psychology behind online consumer behaviour is key for competing in today's markets, which are characterized by ever increasing competition and globalization (Martinez-Ruiz & Moser, 2019).

According to Eurostat (2019), most EU Internet users access the internet regularly, 87% of them are online every day and a further 10% at least once per week, but not daily. These facts show us how important online migration really is. Moreover, it leads to the need of a proper understanding of what people actually do online.

Internet shopping is the third most popular in terms of online activities, being used by 71% of internet users, after using the Internet for listening to music, playing games or watching videos (81%) and reading news online (72%) (European Commission, 2020). This data has to be understood as an EU average,

as there are some countries in which the percentage is still low, such as Romania, where there are only 29% Internet users that shop online.

Academic specialists as well as practitioners have a hard time trying to understand the psychological state of consumers while they are making purchases. Due to this hard task of drawing generalized conclusions, there has been a number of studies that have come out hypothesizing different factors (Bacik et al., 2014; Bucko et al., 2018; Lim et al., 2016; Park & Kim, 2003; Reile, 2017).

Although we already know that the purchasing behaviour is influenced by demographics, channel knowledge, and shopping habits, Reile (2017) states that there are also many other factors that are observable which can lead to having higher transaction rates and having a glimpse into shopping behaviours. Among these factors, the author includes the financial risk, which is defined as the perception that a certain amount of money could be lost while purchasing.

Dange and Kumar (2012) put a lot of weight on the perceived trust of online shops, as they developed a conceptual model for the online consumer buying behaviour, where trust is not just one of the starting factors, but is placed as a filtering element after the pre-buying decision based on reasons is made.

In order to understand factors such as financial risk or perceived trust and trustworthiness, it is necessary to dig deeper into component elements. One of these elements refers to payment options and methods, thus it is important to understand shoppers' attitude towards online payment, their reasons for using credit cards in online shopping and the barriers that make them reluctant in opting for online payment.

Payment methods are also taken into consideration for customer satisfaction, as Guo et al. (2012) present it in their model that consist of 8 satisfaction factors for online customers: web design, security, information quality, payment methods, e-quality of the service, product quality, product range, and service provision.

Antinoja and Scherling (2019) examined the relevance of online trust and online security and identified a direct relation to purchasing cancellations due to trust and security issues in e-payment methods.

In her article about the Romanian online shopping market, Alexe (2018) says that the use of cash will continue to decrease and there will be more options for alternative payment methods. Most likely, credit and debit cards will benefit in the short term, but as alternative method awareness grows, it is possible for their market share to also decrease (Alexe, 2018). However, Romania is a special market in terms of adapting to new payment technologies, thus we shouldn't skip the credit card payment so rapidly and assume that consumers will migrate towards alternative methods.

3. Research Questions / Aims of the Research

Considering the above-mentioned context, this paper is presenting the results of a quantitative research that aims to describe the attitude of Romanian Internet users in terms of payment choice in online shopping.

In order to have a better understanding of the research problem, the objectives were designed on the funnel principle, going from a more general perspective on online shopping all the way to details about payment and factors influencing the decision of credit card usage in such purchases. The main research objectives are presented below:

a) Romanian online buyer profile (frequency of online stores visits, number of online stores visited in the last 12 months, frequency of online shopping, reasons for buying online);
b) Payment methods used for online purchase;
c) Reasons for and against card payment in online shopping;
d) Criteria on which the decision to pay by card in online shopping depends.

The research hypotheses are that Romanian Internet users are still reluctant when it comes to giving date about their financial instruments, distrust being the main reason for which most of them are opting for cash payment upon delivery.

4. Research Methods

Having as scope the analysis of Internet users' behaviour, this research was conducted through an online survey. We have opted for a quantitative method of research in order to obtain quantifiable data that latter can be analysed and compared to the literature review information and market available information.

Data collection was done in collaboration with a specialized market research company, which gives our study representativeness and relevance for the structure of the Romanian market.

The data was collected before the Covid-19 pandemic period (February-March 2020); thus, this research is showing a normal consumer behaviour trend for Romania, not the version altered by population movement restrictions that started in the second part on March 2020. This data can be taken into consideration when developing new marketing strategies for the post-pandemic recovery period, where policies and actions have to be developed on the general situation, not the exceptions.

The research had a sample of 4,000 respondents, using a stratified sampling method (as seen in Table 1), questionnaires being distributed among members of an online representative panel of over 40,000 persons from cities with more than 50,000 inhabitants.

Table 1. Research sample

Gender		**Age**				
Male	Female	18-30 years	31-40 years	41-50 years	51-60 years	>60 years
47%	53%	21%	27%	25%	20%	7%

Data analysis was conducted using IBM Statistics SPSS 25, where information was first processed, cleaned and validated. Based on standard deviation and coefficient of variation, the "Findings" section is presenting only those data that are statistically relevant.

5. Findings

5.1. Romanian online buyer profile

For a better understanding of the payment choice in online purchasing, we have to first know the Romanian consumer, thus our research started with a section about the online buyer profile, in terms of frequency of online stores visits, number of online stores visited in the last 12 months, frequency of online shopping and reasons for buying online.

It is important to know how high the exposure to the offer of online stores is, thus respondents were asked to estimate the frequency of online stores visits. One third of them have a daily exposure (32.5%) and another third visit online stores several times a week (35.7%). Therefore, we can conclude that Internet users have a high exposure to online shops offer. Moreover, when it comes to the number of online stores visited in the last 12 months, we can see that the majority have a varied exposure, as 35.5% have checked between 2 and 5 online stores, 35% between 6 and 15, and 27.1% more than 15 stores.

Going forward, from site visits to conversions, we have asked our participants how often they buy online. Using the data from this variable, we have identified a segment that buys at least once a week (16.2%), one with a lower frequency of 1-3 times a month (36.7%) and a third segment with a random frequency (41.8%), the latter buying rarely, most of them once every 3 months.

In order to pay online by credit card, people must first decide to buy online, thus we wanted to identify which are the reasons that make people buy from the Internet. As seen in Figure 1, the most important element is time (70.2%), which can be also used in marketing strategies for promoting online payment with credit cards. The fourth reason (‘it’s cheaper online’) can also be used in such strategies, when users are pursued to choose credit card payment for a supplementary price discount.

Figure 1. Reasons that lead to the decision of buying online (%)

5.2. Payment methods used for online purchase

The main objective of our research is referring to the percentage of people choosing to pay by credit card in online shopping, thus we asked participants to talk to us about all payment options they use for such purchasing. Table 2 shows us that cash upon delivery is still the favourite payment method, even if we are talking about urban inhabitants. We will see in the following sections the reasons behind this decision, in comparison with credit card payment, which was used only by half of Internet shoppers. It is interesting to see that there is also a segment of people (29.2%) that, even if they start the order online, they prefer to close it in the store, where they go for the purchase payment (in cash or by card). We have mentioned earlier in the literature review that alternative payment methods seems to be the future in online purchasing worldwide, however for Romania it is not a stable trend yet, virtual money services being used only by 11.4% of urban Internet shopper at present.

Table 2. Payment methods used for online purchase (%)

Methods	Percent
Cash upon delivery	75.0
Online with the card	56.3
Cash, in the store	15.2
With the card, in the store	14.0
Using 'virtual money' services (PayPal, MoneyBookers, etc.)	11.4
By payment order or bank transfer	8.5
Via SMS	2.2

Bivariate analysis between credit card payment and demographics showed some significant differences in terms of sex, age, occupation, level of education and personal income, as follows:

- 59.5% of male respondents are using credit cards for online purchase payments, compared to 53.6% of female research participants;
- When it comes to age differences, we see that the percentage decreases with age, going from 61% for 18-30 years to 49.2% for persons over 50;
- Those with better paid jobs (managers, employees with higher education) have a percentage almost double compared to those not working at the moment / unemployed or homemaker persons (68.2% versus 39.6%);
- Education also makes a significant difference, as we see that people with primary education have a percentage of 27.8%, compared with 61.2% for those with higher education;
- In terms of personal monthly income, 46.4% of respondents with less than RON 2,000.00 choose credit card payment, whereas those with over RON 6,000.00 prefer this payment method (as 78.1% of them use it).

5.3. Reasons for and against card payment in online shopping

The main reason for which Romanian online shoppers choose card payment is convenience (59.6%), but it should not be neglected that for many respondents this decision was one induced by the merchant, as 42.5% mentioned that they didn't have any other payment option. Considering that, as it can be seen in Table 4, people are reluctant in using credit card for online payment due to trust issues, it is interesting to see that we have however a segment of 28.3% that see credit card payment as being safe (Table 3, row 3). There is also a segment (25.9%) that understands the true meaning of online commerce, which implies Internet usage from beginning to the end of transactions.

Table 3. Reason for choosing card payment for online shopping (%)

Reasons	Percent
Because it's more convenient	59.6
Because I had no other available way	42.5
Because it's safe	28.3
Because "true online commerce" also means electronic transactions	25.9
Other reasons	2.4

On the other hand, the main reason why Romanians do not use credit cards for online purchases is related to the insecurity they feel in the online environment, which makes them reluctant to provide the card data. This reason is closely related to the second reason, which refers to a general insecurity, not only related to financial data provided.

Table 4. Reason against card payment for online shopping (%)

Reasons	Percent
In principle, I do not trust to provide the card data	67.1
I'm afraid of being cheated	45.6
Recovering money in case of fraud takes a long time	31.7
Other reasons	8.9

5.4. Criteria for decision making in online credit card payment

In order to build a proper marketing strategy for enhanced credit card usage in online shopping, we have asked respondents to evaluate, on a scale from 1 to 5 (where 5 is the maximum grade), how important are a series of elements in their decision to pay by card. As shown in Table 5, payment security is the most important, which has to be guaranteed by the store, meaning that it is has to be literally written on the website. The second most important is the store's reputation, which means that it comes bundled with payment security. Previous experience also helps, as it gives consumer the peace of mind regarding trustworthiness.

An efficient marketing strategy that can be used in order to convince shoppers to choose credit card payments refers to supplementary facilities, such as payment in instalments or loyalty points.

Table 5. Criteria that influences the decision to pay with credit card online (%)

Reasons	Average score (on a scale from 1 to 5)
The store's website guarantees payment security	4.57
The reputation of the store	4.25
I have previously bought products from this store	4.19
Facilities offered by card payment (possibility to pay in instalments, loyalty points, etc.)	4.08
It is a store abroad (payment options are limited)	3.52

6. Conclusions

The main conclusion of this study is that, on the Romanian market, there is still a need to work on trustworthiness for credit card usage in online purchasing, fact that validates our research hypothesis, together with the fact that cash upon delivery is still the favourite payment method, even for urban Internet shoppers.

However, there are some segments that are more prone towards electronic transactions, such as young people under 30 years of age, people with higher education level and monthly personal income. Marketing strategies can start with these segments, using them as testimonials from early adopters, leading to increased usage by the early majority.

The academic, private, and public policy communities each have a vested interest in understanding consumer payment behaviour, but each have different goals, motivations, and methodologies for studying this behaviour (Crowe et al., 2006). As discussed in section 5 of this paper, our motivation was to see what insights can we draw from our research, insights that can be latter used in marketing strategies which will favour migration towards electronic payment methods, to the detriment of cash.

Considering that one of our research limitations refers to sampling only urban population, future research can also include rural inhabitants, as we also see a trend in the migration from urban to rural areas of people with purchasing power.

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References

[1] Alexe, A. (2018). *Romania's online shopping rates among the lowest in Europe; most prefer to pay on delivery*. Retrieved form https://business-review.eu/money/europeans-showing-more-interest-in-alternative-online-payment-methods-survey-finds-178564.

[2] Antinoja, R., & Scherling, D. (2019). *The Effects of E-payment Methods on Online Purchasing Cancellation. An empirical study on Swedish consumers' perception of trust and security in e-payments*. Retrieved from https://www.diva-portal.org/smash/get/diva2:1320654/FULLTEXT01.pdf.

[3] Bacik, R., Szabo, Z. K., & Fedorko, R. (2014). The analytical insight into customer perception of quality determinants of the e-commerce model b2c subjects in the central European countries. *Quality Innovation Prosperity*, 18(2), pp. 15-26.

[4] Bucko, J., Kakalejcik, L., & Ferencova, M. (2018). Online shopping: Factors that affect consumer purchasing behaviour. *Cogent Business & Management*, 5(1).

[5] Crowe, M., Schuh, S., & Stavins, J. (2006). *Consumer Behaviour and Payment Choice: A Conference Summary*. Boston: Federal Reserve Bank of Boston. Retrieved from https://www.econstor.eu/obitstream/10419/59235/1/514865156.pdf.

[6] Dange, U., & Kumar, V. (2012). A Study of Factors Affecting Online Buying Behaviour: A Conceptual Model. *SSRN Electronic Journal*, 2(2), pp. 1-11.

[7] European Commission (2020). *Digital Economy and Society Index Report 2020 - Use of Internet Services*. Retrieved from https://ec.europa.eu/digital-single-market/en/use-internet.

[8] Eurostat (2019). People & businesses online. Retrieved from https://ec.europa.eu/eurostat/cache/infographs/ict/bloc-1a.html.

[9] Guo, X., Ling, K. C., & Liu, M. (2012). Evaluating factors influencing customer satisfaction towards online shopping in China, *Asian Social Science*, 8(13), pp. 40-50.

[10] Lim, Y. J., Osman, A., Salahuddin, S. N., Romle, A. R., & Abdullah, S. (2016). Factors Influencing Online Shopping Behaviour: The Mediating Role of Purchase Intention. *Procedia Economics and Finance*, 35, pp. 401-410.

[11] Martinez-Ruiz, M. P., & Moser, K. S. (2019). Studying Consumer Behaviour in an Online Context: The Impact of the Evolution of the World Wide Web for New Avenues in Research. *Front. Psychol*, 10, pp. 27-31.

[12] Park, C., & Kim, Y. (2003). Identifying key factors affecting consumer purchase behaviour in an online shopping context. *International Journal of Retail & Distribution Management*, 31(1), pp. 16-29.

[13] Reile, W. (2017). *Factors Influencing Online Shopping Behaviour of Consumers*. Retrieved from https://www.searchfit.com/2017/05/01/factors-influencing-online-shopping-behavior-consumers/.

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ESG Ratings of MSCI ACWI Index Companies: DOW 30 and Global 500 European Constituents

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Abstract

The research examines the MSCI Environmental, Social and Governance (ESG) ratings of US companies comprising the Dow 30 and provides a comparison to the ratings of Fortune 500 Global companies domiciled in Europe that are included in the MSCI All Country World Index (ACWI). MSCI Ratings for over 2,800 companies are publically available and measure a company's resilience to long-term, financially relevant ESG risks. This report includes, inter alia, (1) a five-year trend analysis (i.e., 2015-2019) of MSCI ESG ratings for a sample of 140 companies as well as analyses and geographic comparisons for sample companies disaggregated as follows: US Dow 30 and Europe (and within Europe for France, Germany, UK, Switzerland, Spain, Netherlands, Italy, Ireland, and Poland); (2) for the Dow 30 and European subsamples, a five-year by industry trend analysis (i.e., 2015-2019) of MSCI ESG ratings. Industry classification is based on the Global Industry Classification Standard (GICS); (3) a comparative analysis of the percentage of Dow 30 and European (and within Europe for France, Germany, UK, Switzerland, Spain, Netherlands, Italy, Ireland, and Poland) MSCI companies classified as ESG leaders, average performers, and laggards in 2019; (4) a five-year trend analysis of ESG ratings for the 18 CEE Top 500 companies included in the MSCI ACWI Index.

Keywords: MSCI ESG Ratings, DOW 30, Fortune 500 Global Companies.

JEL Classification: Q01

1. Introduction

This research examines the MSCI Environmental, Social and Governance (ESG) ratings of United States (US) companies comprising the Dow 30 and provides a comparison to the ratings of Fortune 500 Global companies domiciled in Europe that are included in the MSCI All Country World Index (ACWI). MSCI Ratings measure a company's resilience to long-term, financially relevant ESG risks. Dow 30 companies are considered to represent the present state of the US economy. Thus, their performance, including in terms of exposure to ESG risks and how well the constitute companies manage these risks, receive considerable attention from

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investors, the media, and the public at large. As such, it is logical for stakeholders to expect Dow 30 companies to be ESG leaders. However, a five-year analysis of MSCI ESG ratings from 2015-2019, indicates the Dow 30 have much work to do. Throughout the period, the Dow 30 ratings were consistently significantly lower than those of Fortune 500 Global companies domiciled in Europe and included in the MSCI ACWI Index.

2. Problem Statement

Huber and Comstock (2017) provide an overview and analysis of eight ESG service providers including MSCI. Regarding reputation and usage, they identify several institutional users of MSCI ESG ratings including Black Rock, State Street Global Advisors, and Allianz Group.

Several academic studies have utilized the MSCI ratings. Skousen and Li (2019) find a significant positive relation between employee performance and employee dimension ratings; their study is based on ratings from 1991-2015. Polbennikov et.al. (2016) discuss the impact of ESG considerations on performance and valuation of corporate bonds. They identify lower credit risk of companies with high ESG scores. Harjoto et.al. (2019) provide evidence that, for US companies, board nationality diversity and educational background diversity are positively associated with corporate social performance. Their findings thus indicate that improving director nationality diversity and educational background diversity could improve firms' social performance. The authors conclude that the increasing trend of foreign nationals on US boards could shift the focus of US companies to be more stakeholder-oriented. Based on a sample of publicly traded US real estate companies, Cajias et.al. (2014) find a positive relationship between MSCI ESG ratings and Tobin's Q; ESG concerns, rather than strengths, drive the effect. Overall, ESG ratings are associated with lower returns. Furthermore, negative scores appear to be associated with higher returns, at least in the short run, while positive scores have no significant impact on returns. Chan et.al. (2017) examine whether different states of cash flow liquidity influence the extent of a firm's CSR activities. They find a significant negative association between CSR activities and the degree of financial constraints/distress. Their results suggest that companies facing financial constraints, generally, do not engage in any CSR activities.

3. Research questions/Aims of the research

The above-mentioned studies utilize an extensive MSCI database provided behind a paywall. Calvin and Street (2020), alternatively, utilize a subset of the MSCI ratings database, which recently became publicly available in 2019. Their study of US Dow 30 companies indicates that United Nations Conference on Trade and Development (UNCTAD) International Standards of Accounting and Reporting (ISAR) Global Core Indicator (GCI) disclosure levels are generally higher for GCIs associated with financially relevant (as defined by MSCI) ESG

issues, suggesting companies are more likely to address sustainability when doing so aligns with their mandate to shareholders. Correlation analyses reveal that GCI disclosure level indices moderately or strongly correlate with two of three MSCI sustainability ratings, highlighting companies' focus on financially relevant areas. The authors further report that the MSCI ratings of the Dow 30 have, in general, trended higher over time, with increases driven by companies in the Manufacturing, Financial, and Retail industries. The present study builds on Calvin and Street (2020) by further examining the MSCI ratings of the Dow 30 and providing a comparison to 110 Fortune Global 500 companies domiciled in Europe.

4. Research Methods

The primary sample is comprised of the Dow 30 and the Fortune (2019) Global 500 companies domiciled in Europe that are included in the MSCI All Country All World Index (ACWI) and for which publicly available MSCI ESG ratings are available. The MSCI (2020) ACWI represents the performance of large- and mid-cap stocks in 23 developed and 26 emerging markets. At the beginning of 2020, the comprehensive index covered 14,782 companies representing approximately 99% of all global equity investment opportunities.[2]

In 2019, MSCI made publically available[3] its ESG ratings for approximately 2,800 MSCI ACWI companies. The ratings represent a measure of a company's resilience to long-term, financially relevant ESG risks. For each company in the database, the following information is available.

- An annual overall rating for each of the most recent five years. The ratings reflect exposure to ESG risks and how well a company manages those risks relative to its peers.
- A rating distribution indicating where the company falls (i.e., percentile) within its industry and classification of the company as a leader, average, or laggard within its industry.
- For key issues material to the company's industry (e.g., corporate governance, corruption and instability, product safety and quality, carbon emissions, water stress) classification of the company as a leader, average, or laggard.

The research includes, *inter alia*,

- A five-year trend analysis (i.e., 2015-2019) of MSCI ESG ratings for a sample of 140 companies as well as analyses and geographic comparisons for sample companies disaggregated as follows: US Dow 30 and Europe (and within Europe for France, Germany, UK, Switzerland, Spain, Netherlands, Italy, Ireland, and Poland).

[2] See https://www.msci.com/documents/10199/f7349d88-8c6f-46dc-bf0d-f2e02e1f5be5. During 2020, MSCI plans to make ratings for 7,500 of the MSCI ACWI publically available. See MSCI (2019).

[3] Available at https://www.msci.com/esg-ratings.

- For the Dow 30 and European subsamples, a five-year by industry trend analysis (i.e., 2015-2019) of MSCI ESG ratings. Industry classification is based on the Global Industry Classification Standard (GICS).
- A comparative analysis of the percentage of Dow 30 and European (and within Europe for France, Germany, UK, Switzerland, Spain, Netherlands, Italy, Ireland, and Poland) MSCI companies classified as ESG leaders, average performers, and laggards in 2019.
- A five-year trend analysis of ESG ratings for the 18 CEE Top 500 companies included in the MSCI ACWI Index.

5. Findings

5.1. By region/country findings

2019 MSCI ESG ratings are publicly available for all of the Dow 30 companies. Annual comparative ratings are available for 2015-2019 for 29 of the companies. 2017-2019 MSCI ESG ratings are available for 110 Fortune Global 500 companies domiciled in Europe. 2016 and 2015 data are available for 106 and 97, respectively, of the European companies. As reflected in Figure 1, the average (mean) overall MSCI ESG Rating for the full sample of Dow 30 and European companies rose from slightly below A in 2015 and 2016, to approximately A in 2017, to slightly above A in 2018-2019. In 2019, MSCI assigned an ESG rating of AAA to only 25 sample companies (i.e., 2 Dow 30, 6 French, 4 German, 1 UK, 1 Swiss, 4 Spanish, 2 Italian, 3 Irish, 1 Austrian, and 1 Norwegian). The lowest assigned ESG rating in 2019 was for a German company rated CCC consistently from 2016 through 2019.

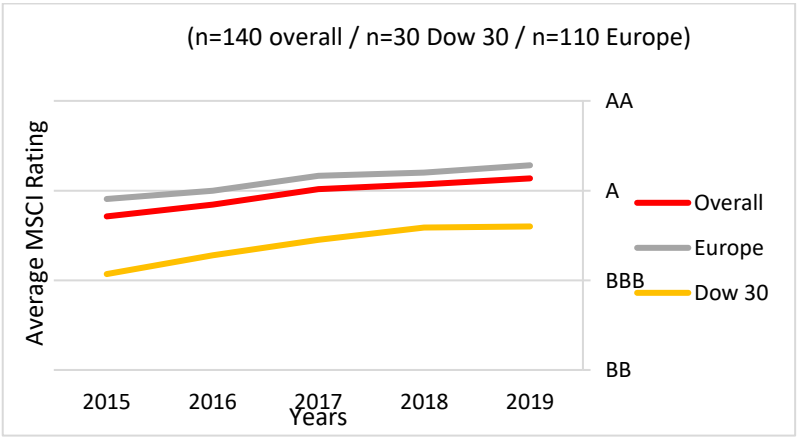

Figure 1. Average MSCI rating for Dow 30 and European companies

As shown in Figure 1, the performance of the Dow 30 companies throughout the five-year period was, in general, consistently lower than that of the sample European companies (significant each year at p =.01). The average overall MSCI

ESG Rating for the Dow 30 rose steadily from approximately BBB in 2015 to exceed the mid-point of A and BBB in 2018 and 2019. As noted above in 2019, MSCI assigned a rating of AAA to only two Dow 30 companies. MSCI rated the remaining Dow 30 as follows, AA 5, A 9, BBB 8, BB 5, and B 1 (not tabulated).

As illustrated in Figure 1, the average overall MSCI ESG Rating for the European companies increased from approximately A in 2015, to A in 2016, to exceed A in 2017 through 2019. In 2019, MSCI assigned a rating of AAA to 23 of the European sample companies. MSCI rated the remaining European as follows, AA 24, A 34, BBB 21, BB 7, and CCC 1 (not tabulated).

Figure 2 shows the average ESG ratings of European companies by country (with three or more companies). In general,

- The ESG rating of French companies (n= 23) rose each year beginning in 2015 at slightly above A to exceed the A and AA mid-point in 2017 through 2019.
- The ESG rating of German companies (n=22) fell during the period from A in 2015 to somewhat below A during 2016-2019. The decline may be explained by the inclusion of the only sample company rated as CCC in 2016.
- The ESG rating of UK companies (n=15) rose overall during the five-year period. The ratings were below the A and BBB mid-point in 2015 and rose to above the mid-point in 2016. The rating rose further towards A in 2017 and 2018. By 2019, the average ESG rating for UK companies was A. Swiss companies' (n=12) ESG rating hovered around A for the five-year period dropping below A (to the A and BBB .75 point) only in 2016.
- Spanish companies (n=9) began the period with an average rating of A in 2015 and rose consistently through 2018 (exceeded AA and A mid-point in 2016 and exceeded AA and A .75 point in 2017) to reach AA before dipping to approximately the AA and A .75 point in 2019.
- The ESG rating of Dutch companies (n=9) rose consistently throughout the period from below the A and BBB mid-point in 2015, to exceed the A and BBB midpoint 2016 – 2018, to exceed the A and BBB .75 point in 2019.
- In 2015, Italian companies (n=6) had an average ESG rating of slightly below A. Italian companies then performed at the A level 2016-2018 and then rose to the AA and A mid-point in 2019.
- Irish companies (n=4) were, on average, among the highest ESG rated European companies throughout the period. In 2015 and 2016, they were rated above A and rose to the three-quarters point between AA and A in 2017. In 2018 and 2019, the Irish companies were, on average, the highest ESG rated European companies at AA.
- At BBB, Polish companies (n=3) began the period with the lowest average ESG rating in 2015 and 2016. By 2017 and 2018, the average rating rose to exceed the A and BBB mid-point. In 2019, the average ESG rating for Polish companies rose to A.

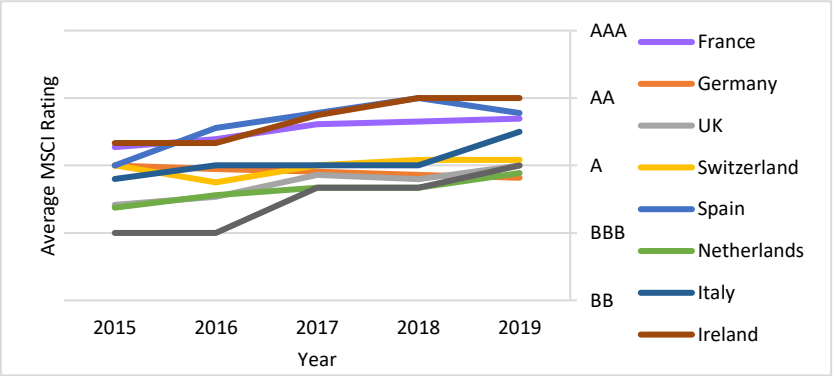

Figure 2. Average MSCI rating for European companies by country

5.2. By industry findings

Utilizing the Global Industry Classification Structure (GICS), Figure 3 provides an overview of the average 2019 ESG ratings of the 140 sample companies by industry. GICS represents a collaborative effort of S&P Dow Jones Indices and MSCI. GICS categorizes companies into 11 major industry groups with each group further subdivided into industries.

- Energy (Energy Equipment & Services / Oil Gas & Consumable Fuels) (n=11 / n=2 Dow 30 / n=9 Europe)
- Materials (Chemicals / Construction Materials / Containers & Packaging / Metals & Mining / Paper & Forest Products) (n=11 / n=1 DOW 30 / n=10 Europe)
- Industrials (Capital Goods / Commercial & Professional Services / Transportation) (n=20 / n=4 DOW 30 / n=16 Europe)
- Consumer Discretionary (Automobiles & Components / Consumer Durables & Apparel / Consumer Services / Retailing) (n = 14 / n=3 Dow 30 / n=11 Europe)
- Consumer Staples (Food & Staples / Food, Beverage & Tobacco / Household & Personal Products) (n= 16 / n=4 Dow 30 / n=12 Europe)
- Health Care (Health Care Equipment & Services / Pharmaceuticals, Biotechnology & Life Sciences) (n = 11 / n=4 Dow 30 / n=7 Europe)
- Financials (Banks / Diversified Financials / Insurance) (n=30 / n=4 Dow 30 / n=26 Europe)
- Information Technology (Software & Services / Technology Hardware & Equipment / Semiconductors & Semiconductor Equipment) (n = 9 / n=6 Dow 30 / n=3 Europe)
- Communication Services (Telecommunication Services and Media & Entertainment) (n=8 / n=2 Dow 30 and n=6 Europe)
- Utilities (n = 10 /n=10 Europe)
- Real Estate (n=0)

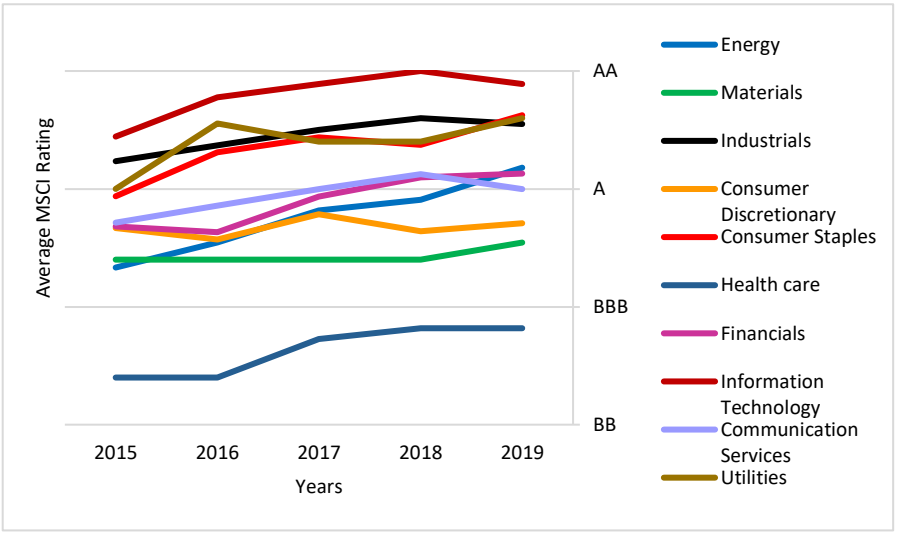

Figure 3. Average MSCI rating of Dow 30 and European companies by industry

The sample includes companies representing 10 GICS industries (i.e., no Real Estate representation). As illustrated in Figure 3, for the overall sample throughout the five-year period, in general, the highest performing industry was Information Technology (IT). In 2015, IT companies were rated below the AA and A mid-point. In 2016 and 2017, the rating was above the AA and A .75-point, and by 2018 the rating had reached AA. The average ESG rating for the IT industry fell slightly below AA in 2019.

Between 2015 and 2019, the next best performing companies were in the Industrials, Utilities, and Consumer Staples industries. In 2015 and 2016, Industrials average ESG rating was above A. The rating then rose to reach the AA and A midpoint in 2017 and to exceed the AA and A midpoint for both 2018 and 2019.

In 2015, in general, Utilities were rated A. In 2016, the average rating was approximately midway between AA and A. The average rating dropped slightly below the AA and A mid-point for 2017 and 2018. In 2019, the Utilities average ESG rating had again risen to above the AA and A mid-point.

In 2015, the average MSCI rating for Consumer Staples was approximately A. The rating then increased but remained below the AA and A mid-point between 2016 and 2018. In 2019, in general, Consumer Staples ESG rating had risen to exceed the AA and A mid-point.

The next cluster of industries includes Communications Services, Financials, Energy, and Consumer Discretionary. In general, Communications Services were rated below A in 2015 and 2016 and rose to reach A in 2017. Average ESG ratings for Communication Services rose slightly higher than A for 2018 and then dropped back to A in 2019.

In general, companies in the Financials industry were rated below A in 2015 and 2016 and then the rating rose to almost reach A in 2017. In 2018 and 2019, the average ESG ratings for the Financials industry rose to slightly exceed A.

Throughout the five-year period, the average ESG rating for companies in the Consumer Discretionary industry was above the A and BBB mid-point. In 2017 and 2019, the rating was approximately at the A and BBB .75 point.

Companies in the Energy industry were, on average, rated below the A and BBB mid-point in 2015 and rose to approximately the A and BBB mid-point in 2016. On average, the ESG rating continued to rise toward A in 2017 and 2018 to exceed the A and BBB .75 point. In 2019, the average ESG rating for Energy companies exceeded A.

Throughout the five-year period, in general, companies in the Materials industry were consistently among the lowest rated. Between 2015 and 2018, Materials were, on average, below the A and BBB mid-point. Materials' average ESG rating rose in 2019 to the A and BBB mid-point.

Throughout the five-year period, in general, the lowest ESG ratings were for the Healthcare industry. The average ratings were below the BBB and BB mid-point in 2015 and 2016. The average rating rose to approximately the BBB and BB mid-point in 2017 and further rose to exceed the BBB and BB .75 point in both 2018 and 2019.

Figures 4 and 5 provide an overview of average MSCI ratings by industry for the Dow 30 and European companies, respectively. All industries with four or more observations are included. As illustrated in Figure 4, throughout the five-year period, in general, the top rated Dow 30 companies were those in the Industrials and IT industries. For 2015-2017, the average ESG rating for Dow 30 companies in the Industrials industry were at the .75 point between AA and A. The average rating fell to the AA and A mid-point in 2018 and then to A in 2019.

In 2015, the average ESG rating for Dow 30 companies in the IT industry was A. The rating rose the next two years to reach the AA and A mid-point in 2017. The rating was higher in 2018 but remained below the AA and A .75 point. The average ESG rating for Dow 30 IT companies dropped in 2019 returning to the AA and A mid-point.

Throughout the five-year period, the average ESG ratings for Dow 30 companies in the Financials, Consumer Staples, and Consumer Discretionary industries were consistently below A with one exception (i.e., the average rating for Consumer Staples rose to A in 2019). In 2015, the average ESG rating for Dow 30 Financials was at the BBB and BB mid-point. In 2016, the average ESG rating had risen to the BBB and BB .75 point. In 2017, the average rating exceeded BBB. In both 2018 and 2019, the average ESG rating for Dow 30 Financials was at the A and BBB mid-point.

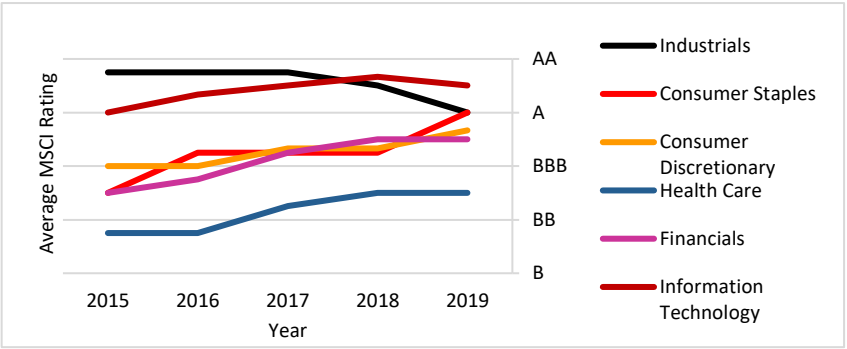

Figure 4. Average MSCI rating of DOW 30 companies by industry

In 2015, the average ESG rating for Dow 30 companies in the Consumer Staples industry was at the BBB and BB mid-point. During 2016-2018, the average rating was consistently higher and exceeded BBB. In 2019, the average ESG rating for Dow 30 companies in the Consumer Staples industry rose to A.

In 2015 and 2016, the average ESG rating for Dow 30 companies in the Consumer Discretionary industry was BBB. The rate rose to exceed BBB in 2017 and 2018. In 2019, the average ESG rating for Dow 30 companies in the Consumer Discretionary industry rose to exceed the A and BBB mid-point.

Consistent with the overall sample, the lowest average ESG ratings for the Dow 30 was for the Healthcare industry. In 2015 and 2016, the average rating was at the BB and B .75 point. The rating rose to above BB in 2017 and continued to rise to the BBB and BB mid-point for both 2018 and 2019.

Figure 5 provides an overview of the by industry average MSCI ESG ratings for European sample companies. For the five-year period, on average, the highest rated companies were consistently those in the IT industry. In 2015, the average ESG rating for the IT industry exceeded AA. The average rating rose for European IT companies in 2016 and remained consistent for the remainder of the period to exceed the AAA and AA mid-point.

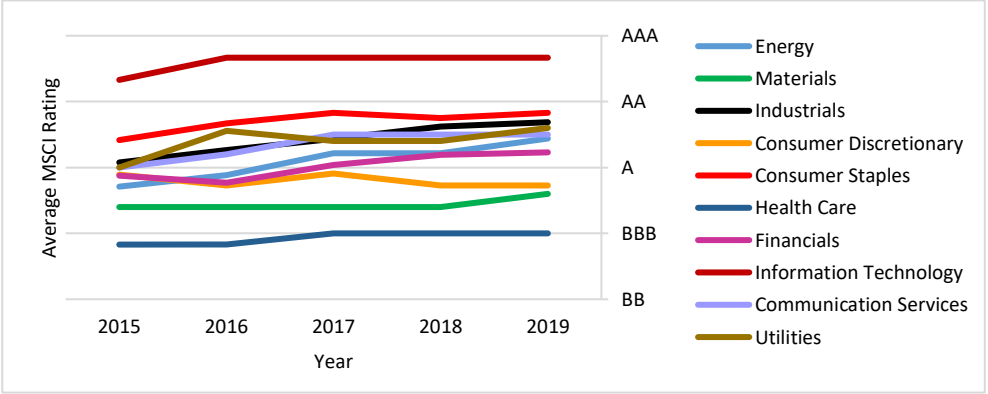

Figure 5. Average MSCI rating of European companies by industry

The next highest rated European companies for the five-year period were in the Consumer Staples industry. On average, the 2015 rating for Consumer Staples was below the AA and A mid-point. In 2016, the rate rose to exceed the AA and A mid-point. For 2017-2019, the average ESG rating for European Consumer Staples exceeded the AA and A .75 point.

On average, European companies in the Communication Services, Industrials, and Utilities industries were rated A or slightly above A in 2015. The average ESG rating for all three industries rose during the period to exceed A and to reach (Communications Services) or slightly exceed the AA and A mid-point (Industrials and Utilities) by 2019.

European companies in the Consumer Discretionary, Energy, and Financials industries, on average, where rated below A in 2015. The average rating for European companies in the Consumer Discretionary industry remained below A the entire five-year period. The average ESG rating for Energy companies rose to exceed A in 2017 and remained above A for the rest of the period. For European companies in the Financials industry, the average ESG rating rose during the period to exceed A in 2017, 2018, and 2019.

For 2015-2018, the average rating for European companies in the Materials industry was below the A and BBB mid-point. The average ESG industry rating for Materials rose to exceed the A and BBB mid-point in 2019.

Consistent with the overall and Dow 30 results, the lowest rated European companies were those in Healthcare. In 2015 and 2016, the average ESG rating was below BBB. The average ESG rating rose to BBB in 2017 where it remained through 2019.

5.3 Findings – leaders, average, laggards

For 2019, Table 1 summarizes the overall ESG performance of sample companies on issues viewed as material to their specific MSCI industry. Table 1 also presents ratings for specific material issues affecting 10 or more companies.

Findings for the Dow 30 appear in Panel A. In 2019, MSCI classified 23.33% of the Dow 30 as industry leaders, 73.33% as average, and 3.33% as laggards. Notably, in terms of Corporate Governance, MSCI categorized the Dow 30 as follows within their industries, 6 (20%) leaders, 20 (66.67%) average, and 4 (13.33%) laggards. A notable finding is that of the Dow 30 companies for which MSCI views Opportunities in Clean Tech as a material issue, 90% (9 of 10) were leaders in 2019. An especially concerning finding is that for the 11 Dow 30 companies rated on Product Safety and Quality, 81.82 (9 of 11) were categorized as industry laggards.

Panel B of Table 1 presents the results for the 110 European sample companies. In 2019, MSCI classified 42.73% of the European companies as industry leaders, 56.36% as average, and 0.91% as laggards. On Corporate Governance, MSCI categorized the European companies as follows within their industries, 56 (50.91%) leaders, 49 (44.55%) average, and 5 (4.54%) laggards. Notable findings include that of those companies operating in industries where MSCI views

Privacy and Data Security (18 0f 33 / 54.55%), Biodiversity (10 of 20 / 50%), Responsible Investment (10 of 16 / 62.50%), Product Carbon Footprint (10 of 15 / 66.67%), Corruption (17 of 33 / 51.52%), Opportunities in Health (8 of 10 / 80%), Raw Materials Sourcing (10 of 12 / 83.33%), and Financial Environmental Impact (13 of 14 / 92.86%) as a material issue, at least half are industry leaders. On a troubling note, for companies operating in industries where MSCI views Product Safety and Quality (16 of 32 / 50%) and Financial System Instability (13 of 17 / 76.48%) as a material issue, half or more are laggards.

Table 1 indicates the overall performance of French companies on ESG issues viewed as material to their industry. In 2019, MSCI classified 43.48% of the French companies as industry leaders, 73.33% as average.

Regarding country specific findings, in 2019, 50% or more of the companies domiciled in Switzerland (6 of 12 / 50%), Spain (5 of 9 / 55.55%), and Italy (3 of 6 / 50%) are industry ESG leaders. In terms of corporate governance, 80% (12 of 15) of UK, 58.33% (7 of 12) of Swiss, 55.55% (5 of 9) Dutch, and 50% (3 of 6) of Italian companies are corporate governance leaders within their industry.

Table 1. Percentage of Dow 30 and MSCI European companies classified as leader, average, or laggard within their industry for 2019 (by country)

	Leader	**Average**	**Laggard**
Panel A: Dow 30 Overall (n = 30)	7 / 23.33%	22 / 73.33%	1 / 3.33%
Corporate Governance (n = 30)	6 / 20%	20 / 66.67%	4 / 13.33%
Human Capital Development (n = 14)	6 /42.86%	8 / 57.14%	0 / 0.00%
Corruption and Instability (n = 12)	4 / 33.33%	8 / 66.67%	0 / 0.00%
Privacy and Data Security (n = 12)	5 / 41.66%	5 / 41.67%	2 / 16.67%
Carbon Emissions (n = 11)	2 / 18.18%	8 / 72.73%	1 / 9%
Product Safety and Quality (n = 11)	1 / 9.09%	1 / 9.09%	9 / 81.82%
Labor Management (n = 10)	4 / 40%	2 / 20%	4 / 40%
Opportunities in Clean Tech (n=10)	9 / 90%	1 / 10%	0 / 0.00%
Panel B: Europe (n= 110)	47 / 42.73%	62 / 56.36%	1 / 0.91%
Corporate Governance (n = 110)	56 / 50.91%	49 / 44.55%	5 / 4.54%
Carbon Emissions (n = 49)	17 / 34.70%	29 / 59.18%	3 / 6.12%
Human Capital Development (n = 44)	15 / 34.09%	23 / 52.27%	6 / 13.64%
Toxic Emissions (n =41)	15 / 36.58%	22 / 53.66%	4 / 9.76%
Labor Management (n = 41)	4 / 9.76%	21 / 51.22%	16 / 39.02%
Privacy and Data Security (n=33)	18 / 54.55%	15 / 45.45%	0 / 0.00%
Product Safety & Quality (n = 32)	4 / 12.50%	12 / 37.50%	16 / 50.00%
Opportunities in Clean Tech (n = 27)	11 / 40.74%	15 / 55.56%	1 / 3.70%
Biodiversity (n = 20)	10 / 50.00%	8 / 40.00%	2 / 10.00%
Access to Finance (n = 19)	7 / 36.84%	10 / 52.63%	2 / 10.53%
Financial System Instability (n = 17)	2 / 11.76%	2 / 11.76%	13 / 76.48%
Responsible Investment (n =16)	10 / 62.50%	6 / 37.50%	0 / 0.00%
Product Carbon Footprint (n=15)	10 / 66.67%	3 / 20.00%	2 / 13.33%
Health and Safety (n=28)	12 / 42.86%	15 / 53.57%	1 / 3.57%
Corruption (n=33)	17 / 51.52%	14 / 42.42%	2 / 6.06%
Climate Change Vulnerability (n=11)	4 / 36.36%	7 / 63.64	0 / 0.00%
Insuring Health and Demographic Risk (n=11)	5 / 45.45%	4 / 36.36%	2 / 18.19%
Opportunities in Nutrition and Health (n=10)	8 / 80%	2 / 20%	0 / 0.00%

	Leader	**Average**	**Laggard**
Water Stress (n=22)	8 / 36.36%	12 / 54.55%	2 / 9.09%
Raw Materials Sourcing (n=12)	10 / 83.33%	2 / 16.67%	0 / 0.00%
Financial Environmental Impact (n=14)	13 / 92.86%	1 / 7.14%	0 / 0.00%
Financial Product Safety (n=10)	2 / 20%	5 / 50%	3 / 30%
Panel C: France (n = 23)	10 / 43.48%	13 / 56.52%	0 / 0.00%
Corporate Governance (n = 23)	10 / 43.48%	12 / 52.17%	1 / 4.43%
Panel D : Germany (n = 22)	9 / 40.90%	12 / 54.55%	1 / 4.55%
Corporate Governance (n = 22)	7 / 31.82	14 / 63.64	1 / 4.54
Labor Management (n = 13)	3 / 23.08%	5 / 38.46%	5 / 38.46%
Carbon Emissions (n = 10)	4 / 40%	4 / 40%	2 / 20%
Panel E: UK (n = 15)	5 / 33.33%	10 / 66.67%	0 / 0%
Corporate Governance (n = 15)	12 / 80%	3 / 20%	0 / 0%
Panel F: Switzerland (n = 12)	6 / 50%	6 / 50%	0 / 0%
Corporate Governance (n = 12)	7 / 58.33%	4 / 33.33%	1 / 8.33%
Panel G: Spain (n = 9)	5 / 55.55%	4 / 44.45%	0 / 0%
Corporate Governance (n = 9)	3 / 33.33%	5 / 55.56%	1 / 11.11%
Panel H: Netherlands (n = 9)	1 / 11.11%	8 / 88.89%	0 / 0%
Corporate Governance (n = 9)	5 / 55.55%	4 / 44.45%	0 / 0%
Panel I: Italy (n=6)	3 / 50%	3 / 50%	0 / 0%
Corporate Governance (n = 6)	3 / 50%	3 / 50%	0 / 0%
Panel J: CEE Overall (n = 16)	3 / 18.75%	11 / 68.75%	2 / 12.50%
Corporate Governance (n = 16)	5 / 31.25%	8 / 50%	3 / 18.75%
Carbon Emissions (n=11)	2 / 18.18%	6 / 54.55%	3 / 27.27%
Toxic Emissions and Waste (n=10)	1 / 10%	8 / 80%	1 / 10%
Health and Safety (n=7)	3 / 42.86%	4 / 57.14%	0 / 0.00%
Corruption (n=7)	3 / 42.86%	2 / 28.57%	2 / 28.57%
Labor Management (n=7)	1 / 14.28%	3 / 42.86%	3 / 42.86%
Panel K: Poland (n= 12)	1 / 8.33%	9 / 75%	2 / 16.67%
Corporate Governance (n = 12)	5 / 41.67%	4 / 33.33%	3 / 25%
Carbon Emissions (n=8)	0 / 0.00%	5 / 62.5%	3 / 37.5%
Toxic Emissions and Waste (n=6)	1 / 16.67%	5 / 83.33%	0 / 0.00%
Health and Safety (n=5)	1 / 20%	4 / 80%	0 / 0.00%
Labor Management (n=7)	1 / 14.28%	3 / 42.86%	3 / 42.86%

Source: author's' own processing

5.4. CEE findings

Given the small representation of CEE domiciled companies in the primary sample, I also examined the MSCI ratings for 16 Top 500 CEE companies covered by the MSCI ESG database; 12 of the companies are domiciled in Poland. As illustrated in Figure 5, for the five-year period of 2015-2019, on average, the MSCI ratings hovered around BBB. As shown in Panel J of Table 1, in 2019, MSCI classified 18.75% of the CEE companies as industry leaders, 68.75% as average,

and 12.50% as laggards. In terms of Corporate Governance, MSCI categorized 31.25% as industry leaders, 50% as average, and 18.75% as laggards. Table 1 also presents separate results for the 12 Polish companies. In 2019, MSCI classified 8.33% of the CEE companies as industry leaders, 75% as average, and 16.67% as laggards. In terms of Corporate Governance, 41.67%, 33.33%, and 25%, of the Polish companies are classified as leaders, average, and laggards, respectively.

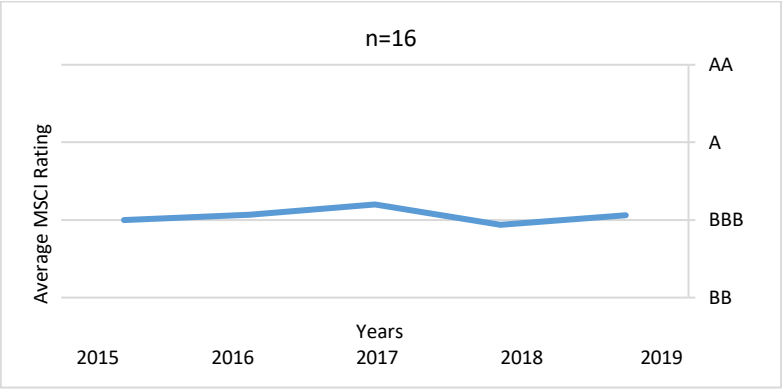

Figure 5. Average MSCI rating of top 500 CEE companies

6. Conclusions

Dow 30 companies are viewed as representative of the present state of the US economy. Thus, their performance, including in terms of exposure to ESG risks and how well the constitute companies manage these risks, receive considerable attention from investors, the media, and the public at large. As such, it is logical for stakeholders to expect Dow 30 companies to be ESG leaders. However, a five-year analysis of MSCI ESG ratings from 2015-2019, indicates that the Dow 30 have much work to do. In general, the average overall MSCI ESG ratings for the Dow 30 rose steadily from above BBB in 2015 to slightly above the mid-point of A and BBB in 2018 and 2019.

Furthermore, throughout the five-year period, the MSCI ESG Dow 30 ratings were consistently lower than those of Fortune 500 Global companies domiciled in Europe and included in the MSCI ACWI Index (significantly lower each year at p =.01). The average overall MSCI ESG rating for sample European companies increased from slightly below A in 2015, to A in 2016, to exceed A in 2017 through 2019. Within the European sample, analyses indicated that, on average, the highest ESG ratings were for companies domiciled in Ireland, Spain, and France. The lowest MSCI ratings, on average, were for companies domiciled in the Netherlands and Poland. While the European companies ESG ratings were on average higher than those of the Dow 30, the findings indicate substantial room for improved ESG performance.

A by-industry analysis reveals that, in general, the highest MSCI ESG ratings for the overall sample were for companies in the IT industry. The next highest ESG

ratings were, on average, for companies in the Industrials, Utilities, and Consumer Staples industries. Companies from Communication Services, Financials, and Consumer Discretionary industries comprised the next lowest ESG rated cluster. Average ratings for companies in the Materials industry were lower. The average MSCI ESG ratings for companies in the Healthcare industry were consistently the lowest for each year between 2015 and 2019. The by-industry findings were relatively consistent for the Dow 30 and European sub-samples.

Given the small representation of CEE domiciled companies in the primary sample, we also examined the MSCI ratings for the 16 Top 500 CEE companies covered by the MSCI ESG database. For the five-year period of 2015-2019, on average, the MSCI ratings of the CEE companies hovered around BBB and were each year lower than those of both the Dow 30 and European Fortune 500 Global sub-samples.

References

[1] Cajias, M., Fuerst, F., McAllister, P., & Nanda, A. (2014). Do responsible real estate companies outperform their peers? *International Journal of Strategic Property Management*, 18(1), pp. 11-27.

[2] Calvin, C. G., & Street, D. L. (2020). An analysis of Dow 30 global core indicator disclosures and environmental, social, and governance-related ratings. *Journal of International Financial Management and Accounting*, 31(3), pp. 323-349.

[3] Chan, C., Chou, D., & Lo, H. (2017). Do financial constraints matter when firms engage in CSR? *North American Journal of Economics & Finance*, 39, pp. 241-259.

[4] Fortune. (2019). Fortune Global 500. Available at https://fortune.com/global500/2019/search/.

[5] Harjoto, M., Laksmana, I., & Yang, Y. (2019). Board nationality and educational background diversity and corporate social performance. *Corporate Governance: The International Journal of Effective Board Performance*, 19(2), pp. 217-239.

[6] Huber, B., & Comstock, M. (2017). ESG reports and ratings: What they are, why they matter? *Corporate Governance Advisor*, 25(5), pp. 1-10.

[7] MSCI. (2019). MSCI ESG research makes MSCI ESG ratings of over 2,800 companies publicly available, Available at https://www.msci.com/documents/10199/fda1c3c5-2062-835b-ae35-111aba6c0d19.

[8] MSCI. (2020). MSCI ACWI All Cap Index, Available at https://www.msci.com/documents/10199/f7349d88-8c6f-46dc-bf0d-f2e02e1f5be5.

[9] Polbennikov, S., Desclee, A., Dynkin, L., & Maitra, A. (2016). ESG ratings and performance of corporate bonds. *Journal of Fixed Income*, 26(1), pp. 21-41.

[10] Skousen, C. J., & Sun, L. (2019). Do employee dimension ratings reflect employee performance? Evidence from MSCI's ESG database. *Applied Economics Letters*, 26(14), pp. 1182-1185.

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Strategic Alignment and Business Performance Model within the Corporate Governance

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Abstract

This paper aims to explore and analyse a strategic alignment and business performance model within the corporate governance. The objective of our research is to debate on the actual organizational needs in terms of reshaping corporate business strategy in connection with the business performance, taking into consideration new IT developments and trends. A research model with seven dimensions for strategic alignment and two dimensions for business performance is considered. A questionnaire including forty-three items is developed based on a content analysis of the previous literature. The qualitative research construct is further tested through two in-depth interviews with a Chief Operations Officer of a Global Competences Centre in the insurance industry and a Managing Director of a Cloud Data Management Company in the software industry. Our contribution is the comparative analysis of perceptual data in terms of management policies related to the strategic alignment in relation with the business performance within corporate governance. The insights of the interviews reflect our choice to operationalize the strategic alignment model construct and complement the conclusions of previous research in the field of business strategy and performance.

Keywords: Strategic alignment model, business performance, corporate governance, information technology.

JEL Classification: M41, M15

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1. Introduction

Strategic alignment is the concept used for understanding how organizations may translate the multi-dimensional business strategy into actual increases in performance (Johnson and Lederer, 2010). Deep changes follow the marketplace globalization and digitalization trends, as organizations need to struggle relations with stakeholders and reconsider their paths to value creation (Bergeron et al., 2004) to attain competitive advantage. In this context, Luftman and Brier (1999) noticed the failure of traditional cost centre or expense approaches of information technology (IT), and highlighted its quality as a driver of business value through strategic alignment, which should endeavour the "strategic fit between strategy and infrastructure as well as the functional integration between business and IT" (p.110).

As noted by Avison et al. (2004) and Chan and Reich (2007), the literature in the field disclosed several terms that are interchangeably used but with sensitive dissimilarities, each denoting strategic alignment: fit (Venkatraman, 1989; Bergeron et al., 2001), linkage (Henderson and Venkatraman, 1989), bridge (Ciborra, 1997), integration (Weill and Broadbent, 1998), harmony (Luftman et al., 1999), or fusion (Smaczny, 2001).

Corporate governance enables both business organisation and information technology to achieve the strategic alignment of an organization (De Haes and Van Grembergen, 2013). Moreover, skills and governance are two main criteria that relate to the strategy communication and execution (Nichol, 2018).

The objective of our research is to debate on the actual organizational needs in terms of reshaping corporate business strategy in connection with the business performance, taking into consideration new IT developments and trends. A research model with seven dimensions for strategic alignment and two dimensions for business performance is considered.

A questionnaire including a total of forty-three items is developed based on a content analysis of the previous literature. The qualitative research construct is further tested through two in-depth interviews with a Chief Operations Officer of a Global Competences Centre (COO of GCC) in the insurance industry and a Managing Director of a Cloud Data Management Company (MD of CDMC) in the software industry.

Our contribution is the comparative analysis of perceptual data in terms of management policies related to the strategic alignment in relation with the business performance within corporate governance. The insights of the interviews reflect our choice to operationalize the strategic alignment model construct and complement the conclusions of previous research in the field of business strategy and performance.

The results of the interviews provide further insights, leading to a reshaping of the strategy design perspective within the corporate governance. Further developments of the strategic alignment model, with possible impacts on growth and profitability are suggested as a result of the interviews.

The remainder of this paper advances as follows: Section 2 reviews the prior research and builds on the research design. Section 3 describes the research methodology. Section 4 presents the empirical results of the interviews. Finally, the main conclusions and future research are presented.

2. The research design

Strategic alignment literature implies that the holistic approach of the business strategy implemented as a pattern of critical decisions becomes a consistency in the behaviour of an organization, relative to the distinction between intentions and realizations (Venkatraman, 1989). Scholars have suggested a differentiation between the concepts of planned/intended and realized strategy (Venkatraman, 1989; Bergeron et al., 2004; Velcu, 2010), emphasizing the importance of analysing not only how the organisation's strategy is designed, but also whether there is a link to its performance.

Based on a literature review, six dimensions of strategic orientation were identified: aggressiveness, analysis, defensiveness, futurity, proactiveness, and riskiness. Next, the authors extended the alignment concept as the fit between each of the six dimensions of the strategic alignment model and a new dimension including indicators embodying the IT characteristics. This improvement of the model may explain the strategic alignment, tailored on specific requirements.

A number of alignment models have been offered in the literature (Avison et al., 2004), amongst which Strategic Alignment Model (SAM) (Henderson and Venkatraman, 1989), strategic orientation of business enterprises (STROBE) (Venkatraman, 1989), strategic orientation of the existing portfolio of IS applications (STROEPIS) (Chan et al., 1997), and MIT90s model (Scott Morton, 1991). The conceptual and practical value of the models was demonstrated when used as a management tool to create, evaluate and support the strategic alignment of an organization.

In line with the prior research, we argue a holistic approach of strategic alignment, as noted by Venkatraman and Prescott (1990), to retain the complex and interrelated nature of the relationships between dimensions. The model of strategic alignment may be discussed in the view of coalignment pattern. Bergeron et al. (2004) identified that conflicting coalignment patterns may be generated between strategy and structure of business and IT as result of many contingencies in the research model.

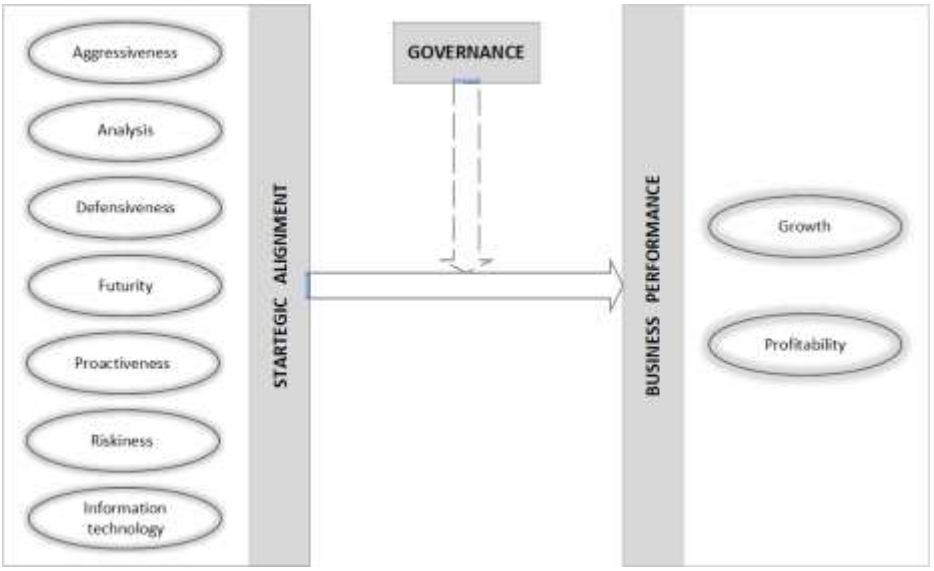

Figure 1. Strategic alignment and business performance model within the corporate governance

Source: Adapted by authors, based on Venkatraman (1989), Bergeron and Raymond (1995), Bergeron et al. (2004), and Johnson and Lederer (2010)

A brief description of the model's dimensions is provided in the following paragraphs.

Aggressiveness. This dimension refers to the policy adopted by an organization in term of resources allocation for improving its market position (Venkatraman, 1989). It also reflects the notion of outperforming competitors as noted by Bergeron and Raymond (1995) and Johnson and Lederer (2010), and the pursuit of market share towards achieving business performance.

Analysis. This dimension refers to the extent of tendency to search deeper for the roots of problems as noted by Venkatraman (1989), including to generate the best possible solution alternatives (Bergeron and Raymond, 1995; Venkatraman, 1989).

Defensiveness. This dimension addresses the prudent action of the organization seeking to attain the efficiency targets by cost reduction (Venkatraman, 1989) strategies. As the organization strategy concerns the preservation of products, markets, and/or technologies, the defensiveness dimension may be analysed, according to Johnson and Lederer (2010), both internally (by reducing costs) and externally (by developing customer relations).

Futurity. This is the dimension positioning the organization in time. As a component of the firm's strategy, futurity needs to be seen on long-term rather than on short-term (Venkatraman, 1989). Thus, the emphasis of strategic decisions lays on effectiveness versus efficiency of the organization (Bergeron and Raymond, 1995; Venkatraman, 1989). Johnson and Lederer (2010) highlight the long-term considerations as extensive forecasting or environmental trends.

Proactiveness. This dimension emphasizes the organization's proactive (devoted and active) conduct in perpetual seeking for new market opportunities, connected or not to the extant business (Venkatraman, 1989). Hence, by reacting to changing competitive environment trends (Venkatraman, 1989; Johnson and Lederer, 2010) and by taking pre-emptive actions (Bergeron and Raymond, 1995), a firm has proactiveness as a strategic pillar.

Riskiness. Considering previous seminal research in the field, Venkatraman (1989) and Bergeron and Raymond (1995) conceptualized this strategic orientation dimension as the organization's risk-taking decisions related to resource allocations, products/services and markets choices. Latterly, Johnson and Lederer (2010) allied riskiness with organizational ventures that may have an uncertain outcome but a likely high return.

Information Technology. In the literature, IT alignment is mostly defined as an organizational-level construct developed in order to capture the degree of correlation between IT and business strategy (Queiroz, 2017). Henderson and Venkatraman (1993) proposed a strategic alignment model which is based on strategic fit and functional integration of external domains (strategy) and internal domains (infrastructure and processes).

Business performance. Contingency studies of the strategic alignment impact on the performance identify positive relationship of the fit between strategic orientation and business strategy on performance (Bergeron et al., 2004; Teo and King, 1996). Chan et al. (1997) found matching moderation in the strategic alignment as a predictor of business performance, while Sabherwal and Chan (2001) noted significant effects on the performance in relation with business strategies' alignment that are found for prospectors and analysers. However, Palmer and Markus (2000) could not find any relationship based on matching mechanisms between strategic alignment and business performance.

Research Questions. Based on the strategic alignment and business performance model within the corporate governance, the following research questions are addressed: *Which of the seven dimensions of the strategic alignment model are considered significant in relation with the business performance? Are there substantial differences between industries?*

Given the complex nature of research questions, Bergeron et al. (2001) and Bergeron et al. (2004) found that an increase in the structural complexity of business strategy may have no impact on the organization's performance, unless considered under the contingency theory. Thus, our proposal of adding a seventh dimension, focused on IT strategy may have a positive impact on the competitive positions in terms of growth and profitability (Chan and Reich, 2007).

3. Research Methodology

Based on a strategic alignment model previously applied and validated in the literature by Venkatraman (1989), Bergeron and Raymond (1995), and Bergeron et al. (2004), extended later by Johnson and Lederer (2010), our methodology involved a qualitative research based on a questionnaire tested through two

in-depth interviews with a Chief Operations Officer of a Global Competences Centre (COO of GCC) in the insurance industry (86 minutes) and a Managing Director of a Cloud Data Management Company (MD of CDMC) in the software industry (35 minutes).

The questionnaire contains items about seven dimensions for strategic alignment and two dimensions for business performance. Thirty-five items are related to the organization's strategic alignment and eight items to the business performance. All of the items used a Likert scale of 1 (strongly disagree) to 7 (strongly agree) with the indicators as they relate to strategic alignment and business performance in the organization.

The present research used the same indicators as in the original instruments incorporated into the STROBE model (Venkatraman, 1989; Bergeron and Raymond, 1995) for the first six dimensions, thus taking advantage of their previous validation. Moreover, the seventh dimension designed based on an analysis of IT concepts, previously used by Bergeron et al. (2004) and Johnson and Lederer (2010) ensures extensive validation for a strategic alignment model adapted to the current requirements of technology.

The first step of the research was to use the content analysis research method in previously published articles addressing the nexus between strategic alignment of an organization and its business performance. This approach helped the authors to design and present a review of previous results of the validation process for the six dimensions of the strategic alignment model, along with the two dimensions of performance, and to identify relevant indicators able to characterise the IT dimension. The research team members, with experience in management accounting, performance measurement, and IT research initially reviewed each instrument.

4. Findings

The dynamic and digitally-oriented 21st century business environment requires alignment between business and IT strategies. A challenging issue arising in this domain is linking the IT strategy with business requirements. For evaluating the maturity of strategic alignment including the IT dimension, the results of our case-study interviews support the proposal of Luftman (2000).

Further, the results of the research are presented, grounding on the validity of the model, assessed by Venkatraman (1989), with reference to both internal consistency of the items measured for each dimension in terms of reliability and unidimensionality, and external validity.

Table 1. Interviews' results on strategic alignment and business performance

Dimensions	Score	
	Insurance	**Software**
A. STRATEGIC ALIGNMENT		
Aggressiveness Dimension		
1 Sacrificing profitability to gain market share	4	6
2 Cutting prices to increase market share	1-2	2
3 Setting prices below competition	1-2	3
4 Seeking market share position at the expense of cash flow and profitability	3	6
Analysis Dimension		
1 Emphasize effective coordination among different functional areas	7	7
2 Information systems provide support for decision making (operational, tactical, strategical)	7	5
3 When confronted with a major decision, we usually try to develop thorough analysis	7	7
4 Use of planning techniques	7	5
5 Use of the outputs of management information and control systems	7	2
6 Manpower planning and performance appraisal of senior managers	7	7
Defensiveness Dimension		
1 Significant modification to the manufacturing/services technology	5	1
2 Use of cost control systems for monitoring performance	4-5	4
3 Use of production/process management techniques	7	1
4 Emphasis on product /service quality through the use of quality circles	7	5
Futurity Dimension		
1 Our criteria for resource allocation generally reflect short-term considerations	3	4
2 We emphasize basic research to provide us with future competitive edge	7	7
3 Forecasting key indicators of operations	7	7
4 Formal tracking of significant general trends	7	7
5. What-if analysis of critical issues	7	6
Proactiveness Dimension		
1 Constantly seeking new opportunities related to the present operations	7	5
2 Usually the first ones to introduce new brands or products in the market	7	3
3 Constantly on the lookout for businesses that can be acquired	7	3
4 Competitors generally preempt us by expanding capacity ahead of them	2	1
5 Operations in larger stages of life cycle are strategically eliminated	1	1

Dimensions	Score	
	Insurance	**Software**
Riskiness Dimension		
1 Our operations can be generally characterized as high-risk	1	1
2 We seem to adopt a rather conservative view when making major decisions	5	5
3 New projects are approved on a 'stage-by-stage' basis rather than with 'blanket' approval	2	5
4 A tendency to support projects where the expected returns are certain	7	6
5 Operations have generally followed the 'tried and true' paths	5	5
IT Alignment Dimension		
1 Knowing the information technology used by your competition.	6	7
2 Instituting a technology watch in order to adapt rapidly your information technology as a reaction to environmental pressure	6	7
3 Use of IT to reduce your production costs	7	7
4 Use of IT to improve your firm's productivity	7	4
5 Use of IT to improve the quality of products or services	7	7
6 Use of IT to meet the deadlines requested by your customers/suppliers	7	7
B. BUSINESS PERFORMANCE		
Growth Dimension		
1 Sales growth position relative to competition	7	7
2 Satisfaction with sales growth rate	7	6
3 Market share gains relative to competition	6-7	6
Profitability Dimension		
1 Satisfaction with return on corporate investment	7	7
2 Net profit position relative to competition	6-7	7
3 Return on Investment (ROI) position relative to competition	6-7	6
4 Satisfaction with return on sales	6	6
5 Financial liquidity position relative to competition	6	7

Source: Synthesis of the interviewees scoring

The aggressiveness dimension is scored higher by the MD of CDMC in the software industry as compared to the COO of GCC in the insurance industry (Table 1) showing an increased willingness of improving market position at a relatively faster rate than the competitors for the revenue-oriented software company.

The two items related to the pricing policy are scored the lowest for both industries. With 2 out of 7, cutting prices to increase market share is classified as a rather inappropriate measure in the context of encouraging a continuous growth of the company, based on its possible perception of the market players.

"…if you have a good product and you lower the price, the market may perceive that there is something wrong with the product." (MD of CDMC)

Although the policy of the insurance company is not characterized by a high aggressiveness, there are specific projects and markets requiring acceptance of a smaller rate of profitability to ensure gaining new markets on innovative products.

Specifically, the company introduced a digital device project, a pioneer at the moment they started.

"…was one of the projects that was not so profitable, but it helped us gain market share for two-three years…" (COO of GCC)

As result of the interviews, *the analysis dimension* is the highest ranked for the two industries, scoring above 5 out of 7 for most of the six items. The insurance company scored 7 for all items, emphasizing the effective coordination among different functional areas. Thus, ignoring the effective coordination amongst all the functional areas may generate negative consequences for both the internal organization of the business, and external customers' relations. Differentiating from the insurance company, the software shared centre scored 2 out of 7 for the *use of the outputs of management information and control systems*. The explanation points to the strong entrepreneurial spirit ("Keep it simple!"), which prevails over the corporate one, based on complex IT systems.

"In our context [of the continuous growth], speaking of strategic alignment, [we need] less systems, but let's do, let's grow, let's analyse." (MD of CDMC)

Following the interview in the insurance industry, the first two items of *defensiveness dimension* were scored with 4 and 5 respectively, out of 7, and the last two received the highest rate stating the interviewee's strong agreement. The arguments of the COO-GCC describe a prudent behaviour:

"Processes are the main tools of the operations sector and sometimes they are overseen […] there is no other way on how to deploy a competitive product." (COO of GCC)

A totally different perspective is registered in the software company as regard to the cost reduction and efficiency seeking methods. Scores of 1 out of 7 assigned to the use of production/process management techniques and modification in technology items show that procedures and process management techniques hinder daily development of activities and it can transform "entrepreneurial" flows into ones specific to a corporation, affecting the firm's agility.

"It's not necessarily bad, but it transforms the company into several layers of approval…" (MD of CDMC)

Except the first item, which was scored with 3 for insurance industry and 4 for software industry, the other items of the *futurity dimension* received the highest rate explaining the companies' orientation on mid-term. Their considerations lay on effective and efficient strategic and tactical decisions.

"…but in multinationals, the vision is towards the future…" (COO of GCC)

"…it's rather midterm…" (MD of CDMC)

For the *proactiveness dimension*, the two companies demonstrated different approaches. The COO of the insurance company showed a high agreement related to the first three items, while the last two received 2 and 1, respectively out of 7, indicating high disagreement. As one of the insurance market leaders, they *"… are the ones to introduce new brands or products in the market." (COO of GCC).* However, they are constantly searching for businesses that can be acquired.

"I would say that Mergers and Acquisitions will be a very important pillar to focus on, and especially in our company." (COO of GCC)

Nonetheless, the COO of GCC expressed her disagreement concerning the operations in larger stages of life cycle that would be strategically eliminated.

"The operational function is the mechanism that makes everything move in every particular project implementation." (COO of GCC)

For the representative of the company in the software industry, the indicators do not have high rates; on the contrary, for the item "constantly seeking new opportunities related to the present operations", the MD assigned 5 out of 7. The software company is seeking for new products and trends, rather than researching for present activities. As for being the first to introduce new brands on the market, the score was 3 out of 7. The quality policy was previously indicated as important, therefore the MD specified also that, even though the firm risks to stay behind its competition, it is preferred not having the lowest price, but offering a product with an improved quality at the end. MD described in this way how the company operates:

"…if I am the second, I give it better than the one who launched it … quickly after the competitor gave it…" (MD of CDMC)

The software company is not necessarily "on the lookout for businesses that can be acquired", but rather intends to grow by itself; thus, the item scored only 3 out of 7. For the last 2 items, "competitors generally preempt us by expanding capacity ahead of them" and "operations in larger stages of life cycle are strategically eliminated", the given score was minimum: 1 out of 7. The main argument is the business reality: its IT market sector is clearly defined in the context of sustainability, and the approach of the services offered is different from that of the main competitors.

Within the corporate governance, *the riskiness dimension* appears rated almost identical by the interviewee, except one item: *New projects are approved on a 'stage-by-stage' basis rather than with 'blanket' approval*. The scores are 2 for the insurance company and 5 for the software company. These different visions are also confirmed by the score 7 out of 7 for the use of activity planning techniques in the insurance company and only 5 out of 7 in the software company.

In terms of high-risk operations, the two managers rated with 1 out of 7, but the arguments differ: it seems that in the insurance industry the risks are carefully examined and mitigated, while companies in the software development sector are assuming acknowledged and unknown risks, specific to this dynamic area.

"In the insurance business in terms of operations you don't take any specific risks […]; it is extremely important that every process does not have any risk implication." (COO of GCC)

"It's more aggressive, we take risks." (MD of CDMC)

The three items left show a moderate to high riskiness for both enterprises. Moderate risk was assigned to adopting a conservative view when making major decisions, but the two companies are seeking being permanently innovative. The

same evaluation has the operations generally following the 'tried and true' paths, both rated 5 out of 7.

"…we try to be more and more innovative. […] The ways that were tried before are important, but I would not say that these should be like a mark point." (COO of GCC)

"…it's a good product; go, do, try, do not stay conservative!" (MD of CDMC)

The item regarding the tendency to support projects where the expected returns are certain has received the highest rate, 7, respectively 6 out of 7. The COO of GCC strongly agreed and the MD argued:

"…it is about not doing 10 things, but only 3 things, for those ones taking care to be good and impactful." (MD of CMDC)

An effective corporate governance policy includes also *the Information Technology dimension*. Following the interviews, for the insurance company, this is the second highest rated dimension irrespective of the indicators, as the first two were scored with 6 and the four lasted with 7 out of 7. The COO of GCC strongly agreed with all the items belonging to the IT alignment dimension and accents on improving the organization's productivity.

"Mostly, because of the digitization, it is absolutely necessary to use the IT to improve the firm's productivity. […] we started to build our in-house tools. In order to adapt the need of the productivity increase and to have a tool to show our results for a better reporting." (COO of GCC)

As a general observation, in case of the Cloud Data Management Company, being a software company, both score and response were related to applications and equipment needed not only to manage activities, but also to develop specific IT CDM product. That is how all scores of 7 out of 7, except one – 4 out of 7 -, can be explained. The score 4 was given to the item concerning IT tools dedicated to improving the firm's productivity, referring, for example, also to the developers', not only the sellers' daily work. For the first ones, there are not so evident tools uses.

"In this area, if you don't know [the information technology used by your competition] …"

"We have a team dedicated to Competitive Intelligence, we also analyze with dedicated people [the environment, in order to adapt rapidly to external pressure]…"(MD of CDMC)

The predictive validity of the six dimensions of the STROBE model, enhanced with the IT alignment dimension is addressed by introducing in the questionnaire two dimensions of *business performance*, growth (effectiveness) and profitability (efficiency). As such, after discussing the strategic alignment dimensions, the interviewees were challenged with statements related to growth and profitability describing the business performance for the last five years, relative to the organization's competitors.

The items of both growth and profitability dimensions are rated 6 or 7 out of 7, indicating a high importance for the company in the insurance industry as well as

for the company in the software industry. The sales growth position relative to competition is considered:

"…a strong aspect because the operations are the engine of all the processes that are implemented in a company." (COO of GCC)

Nevertheless, the companies scored with 6 out of 7 the *market share gains relative to competition*, indicating:

"…a strategically thinking point of view…" (COO of GCC).

"*…because in the rest of the regions, we want more than the competition..." (MD of CDMC)*

The profitability dimension received scores of 6 and 7 for all the items. Satisfaction with return on corporate investment and net profit position are seen at the maximum value, "*a very strong aspect, in any business*" (COO of GCC). Meanwhile, the financial liquidity position relative to competition is stronger for the software company. As for the satisfaction with return on sales:

"*You will not implement any project if you do not have return on sales." (COO of GCC)*

5. Conclusions and future research

This study was constructed as an exploration of the management perspective on a proposed strategic alignment model in connection with the perceptual considerations on business performance. The authors' insight is that different economic contexts for companies in different services industries may be characterised by various management policies.

Summarising the findings, useful conclusions may be drawn. On one hand, similar management policies were found for strategic alignment items related to futurity, riskiness and IT alignment dimensions. They are both mid-term oriented and praise a prudent behaviour relative to high-risk operations, major decisions, and certain returns. These results are consistent with previous research (Venkatraman, 1989; Johnson and Lederer, 2010). On the other hand, proactiveness and defensiveness dimensions are differently perceived by the management. While the corporation activating in the insurance industry adopts a more proactive conduct in seeking new markets introducing new brands or acquiring new businesses, the smaller, niche software company assumes a moderate behavior. For the aggressiveness dimension, even if the scores are comparable, the underlying explanations residing from the in-depth interviews with the managers showed diverse perceptions. The different arguments of the managers were in line with the industry and companies' growth objectives, aspects also noted by Bergeron and Raymond (1995).

Furthermore, even if there is evidence that strategic alignment may not have direct or positive performance implications (Tallon and Pinsonneault, 2011), Chan et al. (2006) found that factors such as industry, organizational size, and type of strategy are possible contingent factors affecting the impact of alignment process on the business performance. In line with Tallon and Pinsonneault (2011), the results of the interviews highlighted an increased consideration on the business

performance relative to the investors, for both companies, regardless their performance objectives (profit vs. revenue) or organisational format (entrepreneurial vs. corporation).

IT and strategic alignment may go beyond organizational boundaries, as important changes are likely to occur within the industry as well. Further developments of the strategic alignment model, suggested as a result of the interviews and of the content analysis of previous research may include social dimension, environmental dimension, or sustainability dimension. Finally, the strategic alignment of technology may contribute to keeping the entire organisation focused on the established goals and may be recognised as a critical activity within the corporate governance.

References

[1] Avison, D., Jones, J., Powell, P., & Wilson, D. (2004). Using and validating the strategic alignment model, *Journal of Strategic Information Systems*, 13, pp. 223-246.

[2] Bergeron, F., Croteau, A. M., & Solomon, S. (2001). Organizational and technological infrastructures alignment. *Proceedings of the Hawaii International Conference on System Sciences*, Maui, Hawaii, pp.1-10.

[3] Bergeron, F., Raymond, L., & Rivardet, S. (2004). Ideal patterns of strategic alignment and business performance. *Information and Management*, 41, pp. 1003-1020.

[4] Bergeron, F., & Raymond, L. (1995). The Contribution of IT to the Bottom Line: A Contingency Perspective of Strategic Dimensions, *Proceedings of the Sixteenth International Conference on Information Systems*, Dec 10-13, Amsterdam, pp. 167-181.

[5] Chan, Y., Huff, S. L., Barclay, D. W., & Copeland, D.G.C. (1997). Business strategic orientation, information systems strategic orientation, and strategic alignment. *Information Systems Research*, 8(2), pp. 125-150.

[6] Chan, Y., & Reich, B. H. (2007). State of the Art. IT alignment: what have we learned? *Journal of Information Technology*, 22(4), pp. 297-315.

[7] Chan, Y. E., Sabherwal, R., & Thatcher, J. B. (2006). Antecedents and Outcomes of Strategic IS Alignment: An empirical investigation, *IEEE Transactions on Engineering Management*, 51(3), pp. 7-47.

[8] Ciborra, C. U. (1997). De Profundis? Deconstructing the Concept of Strategic Alignment. *Scandinavian Journal of Information Systems*, 9(1), pp. 57-82.

[9] De Haes, S., & Van Grembergen, W. (2013). Improving enterprise governance of IT in a major airline: A teaching case. *Journal of Information Technology Teaching Cases*, 3, pp. 60-69.

[10] Henderson, J., & Venkatramen, N. (1989). Strategic Alignment: A Model for Organisational Transformation, in: Kochan, T., Unseem, M. (Eds.), 1992. *Transforming Organisations*. OUP, New York.

[11] Henderson, J. C., & Venkatraman, N. (1993). Strategic Alignment: Leveraging information technology for transforming organizations, *IBM Systems Journal*, 32(1), pp. 4-16.

[12] Johnson, A. M., & Lederer, A. L. (2010). CEO/CIO mutual understanding, strategic alignment, and the contribution of IS to the organization. *Information and Management*, 47(3), pp. 138-149.

[13] Luftman, J., & Brier, T. (1999). Achieving and Sustaining Business – IT, Alignment. *California Management Review*, 42(1), pp. 109-122.

[14] Luftman, J. A., Papp, R., & Brier, T. (1999). Enablers and Inhibitors of Business – IT Alignment, *Communications of the Association for Information Systems*, 1(11), pp. 1-33.

[15] Luftman, J. (2000). Assessing Business – IT Alignment Maturity. *Communications of the Association for Information Systems*, 4(14), pp. 1-52.

[16] Nichol, P. B. (2018). Leading organizational change with strategic alignment. Available online at: https://www.cio.com/article/3257609/leading-organizational-change-with-strategic-alignment.html.

[17] Palmer, J. W., & Markus, M. L. (2000). The Performance Impacts of Quick Response and Strategic Alignment in Specialty Retailing. *Information Systems Research*, 11(3), pp. 241-259.

[18] Queiroz, M. (2017). Mixed results in strategic IT alignment research: A synthesis and empirical study. *European Journal of Information Systems*, 26(1), pp. 21-36.

[19] Sabherwal, R., & Chan, Y. E. (2001). Alignment between Business and IS Strategies: A study of prospectors, analysers, and defenders. *Information Systems Research*, 12(1), pp. 11-33.

[20] Scott Morton, M. S. (1991). *The corporation of the 1990s*. Oxford University Press.

[21] Smaczny, T. (2001). IS an Alignment between Business and Information Technology the Appropriate Paradigm to Manage IT in Today's Organisation. *Management Decision*, 39(10), pp. 797-802.

[22] Tallon, P. P., & Pinsonneault, A. (2011). Competing Perspectives on the Link Between Strategic Information Technology Alignment and Organizational Agility: Insights from a Mediation Model the Link Between Strategic IT Alignment and Organizational Agility, *MIS Quarterly*, 35(2), pp. 463-486.

[23] Teo, T.S.H., & King, W. R. (1996). Assessing the impact of integrating business planning and IS planning. *Information and Management*, 30, pp. 309-321.

[24] Velcu, O. (2010). Strategic alignment of ERP implementation stages: An empirical investigation. *Information and Management*, 47(3), pp. 158-166.

[25] Venkatraman, N. (1989). Strategic Orientation of Business Enterprises: The Construct, Dimensionality, And Measurement. *Management Science*, 35(8), pp. 942-962.

[26] Venkatraman, N., & Prescott, J. E., (1990). Environment-strategy coalignment: an empirical test of its performance implications, *Strategic Management Journal*, 11, pp. 1-23.

[27] Weill, P., & Broadbent, M. (1998), *Leveraging the New Infrastructure - How Market Leaders Capitalize on Information Technology*. Harvard Business School Press, Boston, Massachusetts.

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Smart Data as a Result of ERP System and Human Capital

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Abstract

The purpose of the article research is to discuss about the topic of smart data with the help of an integrated Enterprise Resource Planning (ERP) system that can provide detailed reports for all the internal requirements of a company in the accounting field. These reports acquire the smart attributions necessary for the sustainable development of the activity carried out. Regarding the management objectives, the ERP system offers intelligent solutions about the detailed reporting and analysis. This smart data can be accessed in a real time manner if the human capital of the company is well trained to understand the data transmitted by the ERP system. In order to streamline the process of reporting and analyse the key data, it is recommended that before using and implementing an integrated ERP system, human capital represents the value added on the integrated system. In order to reach a maximum level of performance in the company, it is recommended that both staff and structural capital (ERP) work in close connection. A case study was made, based on the application of a questionnaire that allowed to measure the importance of switching from accounting software to an ERP system developed especially for the needs of the company. It has been applied in the financial-accounting departments within several companies. The respondents represent the employees with higher studies in the economic field. They assisted the transition from an accounting system to an ERP system in the company where they operate and noticed the beneficial differences of an ERP system. If this system influences the staff employed through actual working time, smart data from ERP improves the future perspective of the top management. Based on the obtained results, the efficiency of the working time and the improvement of other performance indicators regarding those future directives of the company were concluded.

Keywords: Smart Data, Accounting systems, Enterprise Resource Planning (ERP); Organizational Performance; Human capital.

JEL Classification: A10, C10, G10, M40, M50

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1. Introduction

In this article we started from the idea that an ERP system is an efficient solution for generating smart data for any company operating in the market. Therewith, we followed up its impact on human capital. Through the subsequent contribution of human capital on the information system and the need for financial-accounting data processing, we want to identify the contributions of the information system and human capital.

This article is structured in seven parts. In its first parts we approached three important topics: ERP system, human capital and smart data, based on the specialised literature. The research methodology is composed of four essential components: the literature review, case study, questionnaire and own analysis.

The literature review aimed at the attributes of an integrated ERP system and what it represents for companies in different fields of activity (production, marketing, service provision). The objectives of this article are based on the smart data that an ERP system can offer on working time. The objectives in human capital terms are to identify the degree of involvement and bringing value added by human capital in related activities following the automation of primary accounting; changes in the number of staff following the implementation of an integrated accounting system and the change in actual working time. The system offers this smart information because it can process large series of data. The techniques for evaluating the results emitted by the integrated ERP system are complex. These are eliminating the risk of omitting a key factor in the decision making by the management. In order to respond to the management needs in a relatively timely manner, human capital had to adapt to new demands.

In the second part of the article we conducted a case study, based on the application of a questionnaire that allowed measuring the importance of the transition from an accounting software to an ERP system developed especially for the needs of the company.

The article includes a research on the companies operating on the Romanian market. Based on the obtained results, we performed a statistical analysis, identifying the influence of the presented subject on the vision of Romanian economists.

2. Construction of references

However, the relationship between human capital and the ERP system is also based on the level of knowledge accumulated and currently existing within the company. At the same time, the intelligent results, the technical resources, the organizational needs and the process of implementing the ERP system are the main factors of its use. The results of the research determine how managers can improve the benefits of using the ERP system by achieving optimal results (Nwankpa, 2015).

Moreover the capability of an ERP system is to fulfil the company needs, increasing the user's effectiveness, including the way that employees and system operate, work, and communicate (Ruivo et al., 2020).

The value of an ERP is defined as the extent to which business objectives and performance are improved through the adopted ERP system (Zhu and Kraemer, 2005). Value could also be measured by satisfaction and productivity of system users (Zhang et al., 2005).

The use of ERP is defined as the extent to which the system carries out the activities of the company's value chain (sales, services and purchases). This dimension has its origin in the degree of the system use in sales, services and procurement (Zhu and Kraemer, 2005).

The combination of creating new knowledge and generating value is fundamental to a company's sustainable competitiveness. If the ERP system is planned and properly implemented, it acts as a value enhancer that empowers three value generators (operational processing efficiencies, information provision and new knowledge creation activities) contributing to strategic development (Eslam Nazemi et al., 2012).

Given that the components of intellectual capital are human capital, structural capital and relational capital, we can speak of the competence of the enterprise, where human capital and structural capital act, and of the performance of the enterprise, where relational capital acts together with the knowledge of human capital (learned capital) (Mavridis, 2012).

The success in implementing a large venture project that can change the course of action of a company is given by the human capital that acquires a set of essential business attributes and IT skills (Skok et al., 2002).

Hawa et al. (2002) pointed out that the improvement of an enterprise relies on the success of software engineering projects, which in turn depends on the human resources. Focusing on the human competences has a direct impact on the outcome of the project.

Innovation is the one that differentiates between market competition and attracting new customers (Ornek et al., 2015). This connection is realized through human-relational capital, both having direct implications on the performance of the company. Innovation is modelled in this way, according to the needs of the customers, shareholders, stakeholders and the feedback received from them (Ornek et al, 2015). As intellectual capital encompasses the most important productive functions in an enterprise, it acts directly on the value of performance, by bringing in new clients (developing relational capital), by maintaining structural capital according to market demands and development, and by acting on human capital which, in our opinion, includes all the other components of intellectual capital. Innovation is associated by Ornek et al. with structural capital, but it should also be associated with human capital. So, we believe that innovation is about implementing an ERP system for accounting needs. Human capital holds the key to innovation both for structural capital and relational capital. Thus, an innovative work behaviour, which results from the actions of human capital, together with the

structural contribution, leads to a positive influence on the performance of the enterprise. (Ornek et al., 2015).

Real-time reporting can be done using technological responses such as business process management and monitoring of business activity (for example, by supporting more extensive accounting reporting with more performance indicators), devices mobile (for example, by using the ability to receive immediate notifications), smart data (for example, by selecting the best visual option to represent data and achieve goals), integrating enterprise applications (for example, by using specific languages and powerful reporting tools, which provide a method of labelling financial information) (Antonio Trigoa et al., 2014).

High quality business reporting is the basis of strong and sustainable organization, financial markets and economies. (Madan Lal Bhasin, 2017). We can achieve high-quality business reporting if we have an integrated system in the company that provides smart data and well-trained employees who use the system functions to the maximum capacity. At the same time, ERP system implementation needs an organizational basis to support its development within the company. Therefore, Hamel and Prahalad (1994, cited in Lengnick-Hall et al., 2004) stated that the basis for ERP system implementation should consist in the culture and organizational processes and human capital. We can say that human capital, regardless of the information system performance degree, is indispensable. We believe that the performance of the results and the smart data generated by an advanced informatics system needs a high user competence (Hertati et al., 2015). Therefore, in order to benefit from an advanced system, there is a clear need for well-trained staff within the company. Human capital investments are necessary for the company to become flexible enough to adapt to new emerging trends (Mičiak, 2019), and this investment has to be made at the same time as the investment in implementing an informatics system to meet all the company needs.

Therefore, smart data and the advanced informatics system implementation lead to the idea that as processes are automated, human capital becomes the strategic asset of a company, and maintaining human capital with superior skills is a means of sustaining competition (McCoy et al., 2019).

3. Problem Statement

Due of the fact that accounting systems offer only accurate data about company situation, the need for an analysis perspective has been felt at the top management level of several companies.

Our research idea was to demonstrate that an ERP system brings value added to a company by the smart data that it can generate, thus providing detailed, structured reports based on the requirements applied by any user.

From the experience on the labour market we have noticed that at this moment smart data are often represented by intelligent systems that can generate accurate, precise and concrete information that a company needs.

Often, these systems are the ERP type, and can be modelled according to the requests and particularities of information of each company. From their own

perspective, smart data is that information that gives the user access to what is necessary / essential, without processing them to achieve the desired result. These systems can process a large volume of data and materialize the results that the company uses to analyse the targeted elements. The data subject had to use an ERP system and to have the necessary knowledge of what accounting means. We also looked for those people who used both: an accounting system and an ERP system to make the difference.

Therefore, our researchers' idea started from the fact that regardless of the financial-accounting process automation degree, human capital is an asset that is indispensable for the company. Its preparation in accordance with the expectations that the company has from the IT system, must be at the highest level.

Raising standards on human capital is the company's expectation for the information system. Developing and training are the first steps that a company takes in order to implement a new computer system.

To conduct the research, we quantitatively measured the responses and analysed their vision on the implementation of an ERP system.

As expected, the ERP implementation and the preparation of human capital in this regard have a significant influence on all factors reported in the questionnaire. The choice of questions was based on the situations faced by company employees when using both accounting software and an ERP system, thus being able to make a materialized difference in the actual working time.

The purpose of the research article is related to the subject of smart data that can be provide / manage by an ERP. This system can provide detailed reports for all the internal requirements in the financial or commercial field. At the same time, we followed up the impact on human capital, not only through the actual working time, but also through the value added it can bring. These reports acquire the intelligent tasks necessary for the sustainable development of the company activity. In terms of management objectives, the ERP system provides intelligent solutions for detailed reporting and analysis.

Regardless of the balance sheets, the ERP system can be developed on a certain area that the company needs (e.g.: some companies want to observe a clearer and higher analytical position on the stocks, while another company needs a detailed analysis on the trade receivables). Other companies had to adapt their internal situation to the permanent needs of external users (e.g.: websites for displaying services / goods offered by the company). Another problem reported was about the time spent on data analysis by the employees. Time is one of the most important factors to bring value added, being the key to performance. The system offers intelligent reports, but it is definitely necessary that the employee understands the results. This investment is essential, for the human capital vs. structural capital, as well as the effective working time vs. global performance relationship. The mentioned problems were quantitatively measured based on a questionnaire of 20 queries. It was related to the vision of the interlocutor, the transition from accounting informatics system to integrated ERP system, and the employees' reaction to the changes that occurred. The intention was to measure the impact of

change on the performance of human capital in the internal economy of the company. The employees' first reaction for the change was not a positive one, because the things should be assimilated in an unexpectedly large volume. Although initially the change was not considered opportune, during this time they enjoyed the efficiency of the work tasks (before they had to process reports according to certain categories, at present they can check the category by obtaining the desired report in real time).

4. Research Questions/Aims of the research

A first question of the study is whether an ERP system is a solution to generate smart data that a company needs. Another question: Is the integrated ERP system an efficient solution in terms of working time savings vs. effectively analysing the generated reports? Following the answers received, it was found that the ERP system brings an improvement and development of the economic activity for a company through human capital. The next question is: "Can the ERP system implementation lead to accounting automation?" However efficient an integrated system is, it requires well-trained employees to add real value for a company, and human capital remains an indispensable asset. One last question is: how developed is the vision / perspective of the Romanian respondents on the analysed subject?

5. Research Methods

Our objective is to show the impact of smart data issued by an ERP system in a strong relationship with the human capital on the socio-economic performance at the company level (human capital relationship, structural capital, relational capital). From our experience on the labour market we have noticed that at this moment smart data is limited to intelligent systems (most of them – ERP systems) that can be modelled according to the need and particularities of the information of each company. These systems can process a large volume of data and materialize results that the company uses for analysing the targeted elements. The socio-economic model analysis is based on the effective working time from the database responsibilities, which was subsequently automated through the ERP system. The analysis method used was quantitative, the questionnaire. The questionnaire was realized on the Survivor platform, being free of charge. Depending on the answers received the results were analysed and interpreted on each question separately. The questionnaire was created in January 2020. Responses were received within 2-3 months.

6. Findings

We used a sample of 35 people, from the financial-accounting department of several commercial companies operating on the Romanian market, in Bucharest. The number is relatively small because at this moment the financial departments on the Romanian market have relatively few employees. This low number of employees in the financial department is also due to the automation of accounting

systems. At the same time, this number is also due to the fact that this questionnaire was not offered to any person. Target persons had to have the necessary knowledge about what accounting means and about using an ERP system. We also looked for those people who used both: an accounting system and an integrated ERP system to make a difference. To carry out the research we measured the answers quantitatively and analysed their vision on the implementation of an integrated ERP system. We analysed its direct influence on working time based on the smart data provided by the system. In order to carry out the actual research, according to the answers received from the questionnaire, the results were analysed and interpreted based on statistical tests. As expected, the implementation of an ERP system has a significant influence on all the factors reported in the questionnaire. Because of the fact that it was addressed to the people directly involved in the use process, the results were relatively close to reality. The choice of questions was based on the situations faced by the employees of the companies when using both an accounting software and an ERP system, thus being able to make the difference materialized during the actual working time.

In order for any reader to have a more detailed idea on the asked questions as well as on the answers received from the Romanian respondents, we highlighted a chart, which included the structure of the questionnaire. The questionnaire was numerical and had unique answers, which the respondents were able to score from 1 to 5. Variant 1 meant "the least", and variant 5 meant "the most" (please see figure 1). This graph presents the exact answers of the respondents on the topic of the questions addressed.

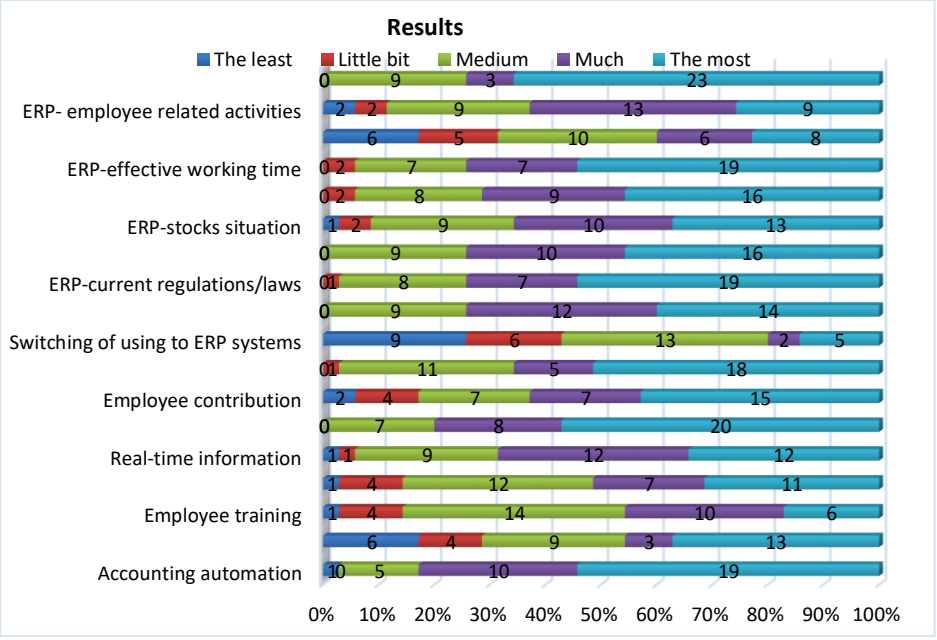

Figure 1. Results of the questionnaire

Source: own processing, questionnaire results

Nevertheless, we can see the total number of respondents and also the frequency of their answers based on this graph. Taking into account the fact that the received answers were "the most" (more precisely the answers with number 5, which represents the variant "the most") predominated in the questionnaire we decided to highlight on a separate graph their frequency in percentages (please see figure 2).The highest percentage was recorded on the questions related to the ERP system and smart data. Therefore, the subject is quite common and appreciated by Romanian respondents.

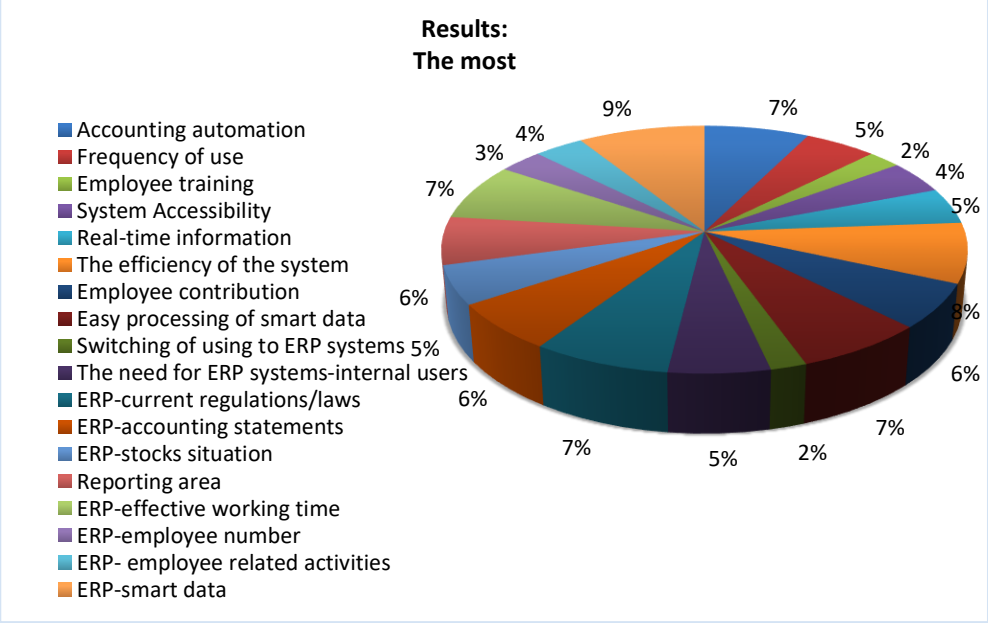

Figure 2. Results: the most

Source: own processing, questionnaire results

In order to accentuate in as much detail as possible the answers received, we also made a statistical analysis based on a regression. The research is based on the questionnaire aimed at a multifactorial model. The questions represented the variable X, and the answers received represented the variable Y. Both figure 1 and figure 2 show exactly what questions were addressed to the respondents.

Table 1. Summary output:

Regression Statistics	
Multiple R	0.9999
R Square	0.9999
Adjusted R Square	0.9230
Standard Error	0.0005
Observations	18

Source: own processing using questionnaire results

Multiple R is the multiple correlation coefficient and has a value close to the extreme of 0.99, indicating a direct and strong connection. R square is the correlation coefficient on the square and has a value of 0.99. The square R is 92% of the variation of y, which is influenced by x. The rest of up to 100% is caused by the residual components (deviation factor - Adjusted correlation coefficient - adjusted R square). The standard error is 0.05%. Of all the questions, 18 could be quantified. The other 2 questions refer to the age of the respondents and to whether they are currently using an integrated ERP system.

Table 2. ANOVA

ANOVA					
	df	***SS***	***MS***	***F***	***Significance F***
Regression	5	17.9999	3.5999	12283794	8.1563
Residual	13	3.8099	2.9307		
Total	18	18			

Source: own processing using questionnaire results

The sum of the variation is both due to the regression value of 5 and the residual amounting to a value of 13, out of a total of 18 (these are the liberty degrees). The sum of the squares of the regression is the value of 17.9999 (D square y / x = sum i = 1 to n from (yi- y) square), and the sum of the squares of the residual value (D square e = the sum i = 1 to n from (Yi-yi) square) adds up to 3.8099. Ms-The average of the squares or the corrected dispersion sum the values of 3.5999 for regression with degree of liberty k and respectively 2.9306 for the residual value having degree of freedom of n-k-1, the total degree of freedom being of n-1. The dispersion corrected for the regression value is calculated as "S square y / x = D square y / x / K" and the corrected dispersion of the residual value as "S square e + D square e / nk-1" being equal and square root of the MSE. The total corrected dispersion uses the formula S square y = D square y / n-1. Significance F is the test F for ANOVA, more precisely the set of null hypotheses: the model is not statistically valid and the alternative hypothesis: the model is statistically valid. Critical region F calculation> F; k; n-1-k, summing the value of 8.1564> 0.05, which confirms that the null hypothesis is rejected, and the model is statistically valid. Therefore x is valid as a significant factor. The number 1 means „the least" and 5 means „the most".

The questions represent the free term, and the answers received from the respondents represent the chosen variable. The test statistic represents the significance tests for the parameters. Lower 95% (left limit) = b - (t alpha * se (b) - standard error). Therefore, the alpha parameter is significant, because the probability that H1 can handle (which it claims to be significant) 99%> 95%. Upper 95% (right limit) = b + (t alpha * s.e. (b) - error margin) and summing values over 99%. Therefore, the beta parameter is significant.

7. Conclusions

To conclude, we can say that the smart data provided by an ERP system has a significant impact and influence for a company and its employees. From the statistical results, we have shown that the answers are significantly influenced by the issues raised. The implementation of an ERP system in the Romanian market proved to be welcomed by the top management, but it was accepted with more difficulty by the directly productive employees due to the novelty of the software. The analysis was based only on working time, without taking into account the costs generated by the system and the implementation itself. Human capital is indispensable and an interesting study result is that respondents did not feel sufficiently prepared for efficient and rapid use of the system, a need that staff felt, which shows the company's desire to reduce training costs. Therefore, the respondents consider that they have a very high impact on the tasks contribution in the integrated system, even if it meets internal and external requirements. Therewith, the results show that, by implementing an advanced IT system, the company can benefit from value added, due to the reduction of working time from operational activities and increase in the time that human capital has to analyse and improve the work of structural capital. Informatics can be constantly improved based on the findings, discoveries, and ideas for improvement proposed by the human factor. The study was conducted in small companies, based on the answers received from the employees of the financial departments. The results of the study showed the improvement of working time for certain areas of activity. In the case of accounting automation, the need for prepared, trained and innovative employees is a must have. The system has determined the existence of smart data at the level of the analysed companies, which have responded to the internal and external needs of the companies.

References

[1] Bhasin, M. L. (2017). Integrated Reporting: The Future of Corporate Reporting. *International Journal of Management and Social Sciences Research (IJMSSR)*, 6(2), pp. 17-31.

[2] Hawa, M., & Ortiz, A., & Lario, F., & Ros, L. (2002). Improving the role played by humans in the development of enterprise engineering and integration projects through training based on multimedia. *International Journal of Computer Integrated Manufacturing*, 15(4), pp. 335-344.

[3] Hertati, L., & Zarkasyi, H., W. (2015). Effect of competence user information system, the quality of accounting information systems management and implications insatisfaction user information system (state owner in Sumatera Selatan). *European Journal of Accounting, Auditing and Finance Research*, 3(2), pp. 35-60.

[4] Lengnick-Hall, C. A., & Lengnick-Hall, M. L., & Abdinnour-Helm, S. (2004). The role of social and intellectual capital in achieving competitive advantage through enterprise resource planning (ERP) systems. *Journal of Engineering and Technology Management Jet-M*, 21, pp. 307-330.

[5] Mavridis, D. G., & Vatalis, K. I., (2012). Intellectual Capital Accounting Indicators, *Procedia Economics and Finance*, 1, pp. 276-285.

[6] McCoy, N. R., & Phillips, B., & Stewart, A. C., (2019). Accounting for human capital: Implications of automation and operational performance. *The Journal of Corporate Accounting &Finance*, 30(4), pp. 111-115.

[7] Mičiak, M., (2019). The efficiency of investment in human capital in IT enterprises. *Transportation Research Procedia*, 40, pp. 1134-1140.

[8] Nazemi, E., & Jafar-Tarokh, M., & Djavanshir, R. G. (2012). ERP: a literature survey. *International Journal of Advanced Manufacturing Technology*, 61, pp. 999-1018.

[9] Nwankpa, J. K. (2015). ERP system usage and benefit: A model of antecedents and outcomes. *Computers in Human Behaviour*, 45, pp. 335-344.

[10] Ornek, A. S., & Ayas, S. (2015). The relationship between intellectual capital, innovative work behaviour and Business Performance Reflection. *Procedia - Social and Behavioral Sciences*, 195, pp. 1387-1395.

[11] Ruivo, P., & Johansson, B., & Sarker, S., & Oliveira, T. (2020). The relationship between ERP capabilities, use, and value. *Computers in Industry*, 117, pp. 103-209.

[12] Skok, W., & Legge, M. (2002). Evaluating enterprise resource planning systems using an interpretive approach. *Knowledge and Process Management*, 9(2), pp. 72-82.

[13] Trigo, A., & Belfo, F., & Estébanez, R. P., (2014). Accounting Information Systems: The Challenge of the Real-time Reporting. *Procedia Technology*, 16, pp. 118-127.

[14] Zhang, Z., & Lee, M.K.O., & Huang, P., & Zhang, L., & Huang, X., 2005. A framework of ERP systems implementation success in China: an empirical study. *Int. J. Prod. Econ.*, 98(1), pp. 56-80.

[15] Zhu, K., & Kraemer, K. L. (2005). Post-adoption variations in usage and value of ebusiness by organizations: cross-country evidence from the retail industry. *Inf. Syst. Res.*, 16(1), pp. 61-84.

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Natural Resources Valuation between Quantitative and Qualitative Information

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Abstract

The information regarding the valuation of the natural resources is relevant for the decision-making process at micro and also macroeconomic level, for different purposes such as policy-making or economic analysis. Valuable decisions are based on quality valuation consisting of measurement and estimates. At different stages of economic development, circumscribed within a specific 'maturity level', countries and entities may use specific valuation tools and models. Natural resources represent focal areas for worldwide accounting frameworks such as the System of Environmental − Economic Accounting (2012) or System of National Accounts (2008). These two international accounting frameworks represent important foundations designed to fulfil statistical economic demands for global integration. Different valuation models regarding the natural resources have to respect the basic requirements for information, for comparisons and statistical integration purposes. Price and volume measures have numerical significance but may also present specific qualitative aspects regarding the natural resources flows and stocks. Valuation is influenced by quality differences or quality changes in time. Quality may derive from technological change and innovations, which may transform previous uneconomical resources into exploitable resources. The envisaged objective of the article is to incorporate inside the valuation model the effect of the change in technology, as a driving factor for the application of the anticipation principle within the income approach. The qualitative information is a key-influencing factor for the valuation process and may be included as a parameter under different valuation approaches or methods. Based on our analyses of the Net Present Value approach we propose an enlargement of the calculation model by introducing inside the formula a technological coefficient factor.

Keywords: natural resources, valuation, maturity model, statistical economics, technological coefficient.

JEL Classification: G31, Q00, M21, M41

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1. Introduction

The motivation of the paper is to enhance the importance of the qualitative information represented by the progress of knowledge or future improvements of the related factors of production as an important driver for the evaluation of the natural resources. The main objective was to implement inside the valuation process a quantifiable effect for the qualitative information. The valuation of the natural resources is relevant for environmental policy development and related to decision-making process, at the domestic level, and also between states and at a more international extent. The process of evaluation for natural/environmental resources is a complex task, which includes different measurement techniques. The main approach is based on the principle of market price valuation, adopted by the system of national accounts ('SNA'), but due to the inherent lack of information, the System of Economic - Environmental Accounting ('SEEA') adopts other techniques, too, such as Net Present Value approach, and its cornerstone issue represented by the discounting rates used. The monetary value may be influenced by social valuation aspects, but also by other benefits provided by the environment. In a more precise sense, natural resources are a subcategory of environmental assets including natural biological resources, mineral and power resources, earth resources and aquatic resources, excluding land and farmed biological resources. The final target of performing evaluation of environmental goods in monetary terms is the formation of monetary estimates which can be integrated with information from standard national accounts, in order to measure the national wealth. Our method is based on the analyses of the Net Present Value approach regarding the possibility of bringing on the effect of the influence of technological progress as a calculation coefficient inside the model. The final result of our paper is a Net Present Value model which includes the technological coefficient.

2. Problem Statement

The SEEA, similar with SNA, is considering the value of the accounts based on the marketplace prices (2008, SNA, 3.118), defined "as amounts that willing buyers pay to acquire something from willing sellers" (SEEA Central Framework, 2.144). There are situations when market prices are not findable, and in such situations the valuation process is using market price equivalents, based on similar items. If no equivalent market information is available, the system recommends a secondary way for determining the value, based on the costs of production for goods/services, plus a net return on capital (SNA, 6.125). Ideally, the perfect way of valuing natural resources would be based on the values observed in the markets, where homogeneous goods are traded in significant volumes and the prices are made public regularly. Another secondary approach is represented by the net present value method ('NPV'). In many cases, natural resources have no relevant market transactions or acquisition prices. The net present value NPV approach is using the discounted future returns from the use of the asset. Within the accounting field, the analyses of changes in value over time are based on the changes in prices

or changes in quantity, but reasonably we may also take into consideration the change in quality over time. The valuation of environmental assets is also linked to the progress of knowledge, not only with the factors of production, similarly to the process of economic success of a company (Lundvall and Johnson, 1994). The progress of knowledge and technology brings advantages but is also accompanied by significant negative outcomes, such as deforestation, soil erosion, oil/mineral depletion, greenhouse gas increase or water pollution. Traditionally, the NPV method is built on quantitative factors, while the inclusion of the technological factor represents a qualitative facet of the valuation exercise (Corvello, Iazzolino and Ritrovato, 2013). The *United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009* ('UNFC − 2009') performed a classification of the mineral and power assets based on a project development criterion, trying to determine the maturity level for the extraction and exploration projects, i.e., to what extent these natural resources are confirmed, developed or planned. The criteria used by UNFC − 2009 are:

- Economic and social feasibility (*E*);
- Field project status and viability (*F*);
- Geological datum (*G*).

The third criterion (G) is related to the level of certainty of geologic cognition and potential exploitation of the resource concerned, being directly dependent on the level of technological development. We may apply this kind of classification to other types of natural resources, considering for each type a specific third criterion, similar to G, which has to be linked with the actual technological knowledge and also with the forecast of the development of this aspect.

The valuation process may be performed under three possible approaches, which aims to determine the financial value of the traded resource by using one of the following criteria (Andriessen, 2005): costs, market, and income. When information regarding costs, or market is difficult to be obtained, the valuation process is totally relied on the income-based approach (i.e. present monetary value the resource will expect to generate). The income approach requires a number of hypotheses or assumptions, which are difficult to be validated. Meanwhile the income approach is grounded on the economic *principle of anticipation*, which means that the foresight regarding the change in technology has to be a decisive factor for the valuation of environmental goods. Also, a prime condition, in order to apply the principle of anticipation is the fact that we need to be able to predict the future. The valuation practitioners are applying the *principle of anticipation* by taking into consideration the future in- or outflows generated by the resource based on historical information. Sometimes the potential impact of the future technological progress is located at a thinner borderline, which makes plausible the usage in the calculation model of the possible quantified influence on the in- or out cashflows generated by the resource. Our review of the literature did not identify a prior proposal for the introduction of this calculated technological future impact inside the Net Present Value Approach. We consider that the introduction inside the valuation model of this explicit influence is justifiable under the context where

the influence is significant. If a potential technological development is not providing significant quantitative or qualitative changes, the effect on the valuation process is not worthy to be considered. For example, let us consider the case of the iron extraction as a natural resource. Under the current technological and economical conditions iron is extracted from different minerals, mainly oxides and carbonates. If the technology advancement makes the iron extraction from silicates economical, extensive resources will become available for economical extraction and usage. The impact will be pervasive, and at the moment when the technological progress is perceived as feasible in the near future, it would be justifiable to reassess the valuation of the iron silicates. Another example, maybe the impact of the technological advance in the field of reduction of the greenhouse gases ('GHG') emissions such as carbon dioxide, methane, nitrous oxide. If the technological progress renders possible the storage of the carbon from surrounding atmosphere, in an economical fashion, this event will trigger the extraction production of the fossil fuels, in a significant dimension (Russel, 2016). We consider that the other two valuation approaches (cost and market), are not feasible to be used under our paper perspective because these methods are using historical/market information.

The novelty of our research is represented by the potential use of the envisaged influence of technology *introducing in the NPV method, a calculation coefficient, which can be forecasted by knowledgeable specialists*, with appropriate expertise and time perspective regarding the extraction and technology evolution related to the usage of a specific natural resource. The paper examines the valuation process in the context of technological knowledge valorisation. We try to present from the technique of financial valuation the possibility of creating a mathematical model.

3. Research Questions/Aims of the research

The research question is related to the valuation of the natural resource stock related with the future technological change and innovation impact, which may increase the volume or type of the exploitable resource, or which may transform previous un-economical resources into exploitable resources. The question itself is about whether the future change in technology is taken into consideration, under the methodological recommendations provided by the *System of Environmental − Economic Accounting − 2012*. The purpose of the study is the prospective enlargement of the conceptual framework regarding the valuation of the environmental goods, from the quantitative aspects represented by quantity and prices, to qualitative information represented by the future impact of the prospective technological change. The technological change represents one of the external environmental features, specific to the PEST analysis model (political, economic, socio-cultural and technological), which may open the understanding of a specific market perspective, or the evolutionary direction. We have enlarged the NPV valuation methodology, by including in the calculation formula the technological factor K_t, which may adjust the future cash-flows represented by the nominal value of expected future resource rents. The research approach is

qualitative and theoretical, and the verification of the model may be accomplished by the post-checking of the valuation at a certain moment in time for prior natural resources usage, in comparison with known market values. Our next phase target will be to develop and test our proposition for a practical case related to GHG emission reduction within a public investment project. The logical steps of our proposed method are as follows:

- the quantification of yields on environmental goods;
- the calculation of the forecasted model of resource rents based on anticipated extraction profiles and prices;
- the assessment of the asset lifetime;
- the choice of a rate of return on produced goods;
- the selection of discount rate;
- the choice of the technological coefficient.

Beside the improvements in natural resources usage, brought by the technological progress with its inherent environmental downfalls, we may see that technology may also lead to the developments of what may be called environmental technology, with the principal aim of trying to solve some of the anxieties faced by our modern society (e.g. renewable energy, electrical cars, smart technology etc.).

4. Research Methods

The research method we have applied is mainly qualitative and theoretical being based on the analyses of the valuation methodology for the natural resources used by the SEEA (SEEA, 2012, p. 220). We analysed the academic literature for specific points regarding the valuation of the natural assets under the influence of the technological factor but we did not identify a similar approach regarding the impact on the NPV method, or the implementation of a similar formula which is using the technological factor in a similar way. Under our approach we developed a proposal for a new formula model starting from the SEEA − 2012 model. The research method is based on the classification criteria used by UNFC − 2009: Economic and social feasibility (*E*), Field project status and viability (*F*), Geological datum (*G*), and is trying to generalize this categorization concept to other types of natural resources. We consider that for all types of natural resources the technological factor, in a similar way, may contribute to the recognition of the respective type of resource, and also to the valuation process. The methodology aims to identify the similarities, but also the differences between diverse techniques applied to study the natural resources. The method is an example of *applied induction*, which is the operation of using investigation inference from one environment to another (St. Clair, 2005). Consequently, the induction process is pervasively affected by the unknown factors, which cannot be anticipated. As St. Clair argued, this kind of scientific investigation has to be considered as a means to give rise to experimental heuristics for reasoning and exploration. Our research work represents an essay trying to enlighten the possibility of developing a

generalized view over the valuation process of the natural resources, taking into consideration the influence of the future technology within the process.

5. Findings

The target of the paper is to propose a method for the valuation of the natural resources which is including in the calculation, the impact of the qualitative factor represented by the future technological change.

The valuation of a natural resource assumes that the value of an asset bise equal to the discounted flow of future asset rents:

$$V_t = \sum_{\tau=1}^{N_t} \frac{RR_{t+\tau}}{(1+r_t)^{\tau}} \quad (1)$$

where:

- V_t is the value at the end of period t;
- $RR_{t+\tau}$ is the nominal value of anticipated subsequent asset rents;
- t is at the end of period;
- τ is 1, 2, …, N_t;
- r_t is the nominal discount rate at time t.

The value of the natural resource stock V_t at the period can be described in terms of quantity (Q_t) and price (P_t) components:

$$V_t = Q_t P_t \quad (2)$$

where:

- Q_t is the stock of the raw natural resource considered as at the end of interval t;
- P_t is the constituent price at the end of period t.

We may obtain a more detailed representation of the equation (1) if we present explicitly the resource rent $RR_t = P_{S,t}S_t$ in order to make possible the calculation of the price estimate P_t:

$$V_t = Q_t P_t = \sum_{\tau=1}^{N_t} \frac{P_{S,t+\tau} S_{t+\tau}}{(1+r_t)^{\tau}} \quad (3)$$

In order to make possible the calculation of the price estimate P_t we may assume two hypotheses:

(a) The extracted stock of the natural resource is based on two components: the ***first component*** is based on the information represented by the most recent extraction figures using the actual technology (S), and the **second component** is the estimate of the future change in extraction using new technologies $S_{t+\tau} = SK_{t+\tau}$, where $K_{t+\tau}$ is the technological coefficient at the moment in time $t+\tau$;

(b) The price P_t evolves in time in line with the expected rate of inflation ρ_t.

If we will apply the two hypotheses we may rewrite:

$$V_t = Q_t P_t = \sum_{\tau=1}^{N_t} \frac{P_{S,t+\tau} S (1+\rho_t)^{\tau-1} K_{t+\tau}}{(1+r_t)^{\tau}} == P_{S,t} S_t K_t \sum_{\tau=1}^{N_t} \frac{(1+\rho_t)^{\tau}}{(1+r_t)^{\tau}} = P_{S,t} S_t K_t \Omega_t \quad (4)$$

where $\Omega_t = \frac{(1+\rho_t)^{\tau}}{(1+r_t)^{\tau}}$ is the discounting factor, being the inverse of the real interest rate.

From this equation we may finally calculate the unit price of the natural resource stock:

$$P_t = \frac{P_{S,t} S_t K_t \Omega_t}{Q_t} \quad (5)$$

From equation (5) we may notice that the valuation for the stock of the natural resource is linked with the unit resource rent $P_{S,t}$. The novelty of our research is the potential use and introduction of the coefficient K_t, which can be determined/estimated by technical persons, with appropriate knowledge and time perspective regarding the extraction and technology evolution related to the usage of a specific natural resource.

The valuation methodology for the natural resources is presented as guidance in the *System of Environmental - Economic Accounting 2012 − Central Framework* (SEEA, 2012), circumscribed to the *System of National Accounts,* (SNA, 2008) asset boundary. The SNA does not include specific guidance regarding the valuation methods regarding the natural assets and flows, more guidance and explanations being included within the SEEA. Obviously, on the natural resources will have a major impact the environmental regulations, which may significantly influence the economics of natural goods. The NPV method application as a particular valuation approach for natural resources started to be discussed under the SEEA − 2003 version, where the changes in stock were recommended for valuation purposes, by using the unit asset rent as the cost price. Conceptually SEEA − 2012 presents details for valuation of the natural resources by using the price of the original unmoved asset. The two pricing concepts, linked one with another, are different, and also with different implications regarding the value of natural assets. The formula presented in our research (5) shows the link between the price of the natural asset in the existing place and the unit resource rent, via the influence of the technological factor. We consider the significance of the proposed technological factor K_t as being of decisive importance, because under the modern conditions, science and technological progress are influencing the valuation process at an overwhelming speed. A suitable way for obtaining the estimates of the technological factor can be the use of a panel of knowledgeable specialists participating to a structured communication *Delphi technique*, or other qualitative forecasting methods. Principally, the effect on the value of the technological factor may be of providing the benefit of transforming previously uneconomical resources into exploitable resources.

6. Conclusions

The future technological change and innovation impact is a factor which may influence the evaluation process and also the classification taxonomy of the natural resources. We consider that the evaluation methodology may actively incorporate the impact of the future change in technology in conceptual framework regarding the evaluation of the environmental goods. The extension of the valuation methodology by introducing the technological element presents the advantage of implementing the *principle of anticipation* in a direct relation with the prospective change in technology for the valuation of environmental assets. We consider that the actual methodology may be oriented to the future, by using the forecasts and

estimates about the progress in technology. Another argument for the employment of this technological coefficient/factor may be represented by the user-friendly method, which can be used for the determination, based on qualitative forecasting methods focused on expert teams. The qualitative aspects of the prospective changes related to the external environment, in their entirety (Political, Economic, Socio-cultural and Technological) may be integrated into the valuation models. In our article, we have enlarged the valuation NPV methodology, by including in the calculation formula the *technological factor*, by adjusting the future cash-flows represented by the nominal value of expected future resource rents. The research approach is qualitative and theoretical, and the verification of the model may open the subject of a future research project in order to verify the viability of the proposed model. The research constitutes an essay which endeavors to increase the understanding of the possibility of developing a generalized view over the valuation process of the natural resources, taking into consideration the influence of the future technology within the process. Within our attempt of solving the research question, the knowledge about future technological change is the key driver used for the calculation of the influence on the value.

References

[1] Andriessen, D. G. (2005). Value, Valuation, and Valorisation, In Swarte S. (eds.), *Inspirerend innoveren; meerwaarde door kennis*. Den Haag: Kvie.

[2] Corvello, V., Iazzolino, G., and Ritrovato, V. (2013). Evaluating technological innovations: A method based on comparable transactions. *European Journal of Economics, Finance and Administrative Sciences*, (56), pp. 37-50.

[3] Economic Commission for Europe (2010). *United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009.* ECE Energy Series, 39. Available from http://www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/UNFC 2009_ECE_EnergySeries39.pdf.

[4] Lundvall, B., and Johnson, B. (1994). The learning economy. *Journal of Industry Studies*, 1(2), pp. 23-42.

[5] Russel, S. (2016). *A Recommended Methodology for Estimating and Reporting the Potential Greenhouse Gas Emissions from Fossil Fuel Reserve*. Retrieved from: https://www.wri.org/publication/methodology-calculating-potential-emissions-fossil-fuel-reserves.

[6] St. Clair, R. (2005). *Similarity and Superunknowns: An Essay on the Challenges of Educational Research*. Harvard Educational Review: December 2005, 75(4), pp. 435-453.

[7] System of National Accounts 2008 (2009). Sales No. E.08.XVII.29. Retrieved from http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf.

[8] United Nations, European Union, F.A.O. et al. (2014) *System of Environmental-Economic Accounting 2012 − Central Framework*. 2014th edn, New *York*. doi: 10.5089/9789211615630.069.

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Romanian Housing Market before and during the COVID-19 Pandemic

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Abstract

This research aims to study the sustainability of the development of the housing market before and during the Covid-19 pandemic in Romania. In this regard, the evolution of house prices in relation to their market fundamentals was analyzed, and the price-to-income and price-to-rent ratios and the Hodrick-Prescott filter were calculated. The estimated indicators show that since 2016, the residential property market has entered a new phase of expansion of the real estate cycle, but most likely the turning point will be determined by the intensity of the Covid-19 outbreak. Until the moment of the analysis, the data indicate that the pandemic outbreak did have a mildly negative effect on the housing market in Romania, by decreasing households' intention to purchase a home, the number of new home listings and real estate transactions, mainly in the first weeks of the pandemic. The housing prices remained relatively constant during the state of emergency, but after the gradual relaxation, they began to decline slightly in major cities. Due to the uncertainty regarding the future, the long-term impact of the Covid-19 outbreak on the residential market is unknown, but it will certainly depend on the intensity of the pandemic and the measures taken by the authorities to support the economy.

Keywords: Covid-19 outbreak, housing market, housing prices, Romania, pandemic.

JEL Classification: R2, R21, R31, I15

1. Introduction

The Covid-19 outbreak, labelled as a black swan event and likened to the economic scene of World War Two (Nicola et al., 2020), had and continues to have a detrimental effect on global healthcare systems and, undoubtedly, on the world's economies. The unprecedented social distancing measures adopted by the authorities have reconfigured the value of housing for each individual. Housing has always been a sensitive subject, due to the functions it can perform simultaneously:

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consumption, long-term investment, store of wealth, and collateral for lending. For this reason, the residential market has been the basis of the worst economic and financial crises around the world, highlighting the close link between the dynamics of real estate prices and the financial and macroeconomic stability of a country (IMF, 2019). The financial crisis of 2007-2008, generated by the exponential rise in house prices as a result of financial liberalization, simultaneously affected all economic sectors in most countries of the world. Thus, the housing market has become more sensitive to macroeconomic conditions and therefore, is expected to be significantly impacted by the economic downturn generated by Covid-19 pandemic (Allen-Coghlan & McQuinn, 2020).

As in most countries, the residential real estate market in Romania has been severely affected by the financial crisis, because of the unsustainable growth in housing prices, accompanied by large increases in construction volume and credit. Following the crisis, the activity of the real estate market in Romania underwent a strong correction that affected all economic sectors. Therefore, the real estate market is considered an important source of risk for financial stability and has come under the close monitoring of national and European authorities. Besides, since 2016, Romania has started a new phase of expansion of the housing market activity (NBR, 2017). For these reasons, the dynamics of the residential property market in Romania must be carefully analyzed in the current context of the pandemic to prevent possible negative effects on national macroeconomic stability.

The Romanian government introduced the first travel restrictions starting with March 9, and on March 16 instituted the state of emergency that shut down a substantial portion of the economy, but on May 18 was introduced the state of alert, and gradually the restrictions were relaxed. As a consequence of the Covid-19 outbreak, the National Bank of Romania (NBR) (2020, p. 52) draws attention to the increase in risks generated by the real estate market to financial stability, which are determined by: (i) the decline in investment and trading amid the rise in investors' risk aversion, (ii) the sharp contraction in demand due to lower-income and heightened uncertainty related to future pay, (iii) the increase in credit risk for housing loans and exposures to companies in the construction and real estate sectors, and (iv) the higher liquidity and solvency risk owing to the drop in receipts, as well as to the construction and real estate firms witnessing a reduction and even a shutdown in the activity. Although these factors have been partly offset by the government support programs, the risks persist.

2. Problem Statement

Due to the novelty of the events, few studies investigate the impact of the Covid-19 outbreak on the housing market, and those that exist mainly examine the situation of the real estate markets in the USA (D'Lima et al., 2020; Liu & Su, 2020; Yörük, 2020), China (Huang et al., 2020), Japan (Narro & Katafuchi, 2020), Italy (Del Giudice et al., 2020), Ireland (Allen-Coghlan & McQuinn, 2020) and Turkey (Tanrıvermiş, 2020). The common conclusion of these studies is that the residential real estate markets were severely affected during the Great Lockdown

by the considerable decrease in housing demand, new home listing and volume of housing transactions.

Yörük (2020) found that by mid-April, certain housing markets from the USA experienced more than 60% drop in new home listings and pending home sales relative to the same period in the previous year. In China, the empirical evidence of Huang et al. (2020) showed that the Covid-19 epidemic had a small negative effect on housing prices but a large negative effect on transaction volume. Time on the market was also found to have increased in China (Huang et al., 2020). Allen-Coghlan and McQuinn (2020) indicated that Irish house prices are set to fall over the next 18 months as a result of the Covid-19 downturn, due to the decline in household disposable income and the sharp fall-off in mortgage market activity. In Italy, the drop in the number of real estate transactions is a certainty because of the pandemic but it will not be accompanied by an equal drop in prices, at least not in the short term (Del Giudice et al., 2020). In Turkey, it was also observed a significant decline of real estate sales in the period March-May 2020, but since June, the market has recovered slightly (Tanrıvermiş, 2020).

As studies in the field of residential markets in Romania are generally few, mainly because of the low real estate market transparency and the lack of detailed data, this article fills this research gap from two perspectives. Firstly, the study characterizes the development of the housing market since the years preceding the financial crisis from the point of view of market fundamentals to highlight the particularities of the Romanian residential market. Secondly, the article presents a first view on the effect of Covid-19 shut down and re-opening orders on Romanian residential real estate markets.

3. Research Questions/Aims of the research

This research aims to examine the sustainability of the development of the housing market in Romania before and during the Covid-19 pandemic, taking into account the particularities of the behavior of housing demand and supply in relation to housing prices. There is a widely held view that the current pandemic influences economies as a combined supply and demand shock (Allen-Coghlan & McQuinn, 2020). For that purpose, in a first step, the deviations of house prices from their equilibrium level were studied to identify the possible overvaluations or undervaluations of the market. In the second stage, the evolution of house prices and their market fundamentals since the beginning of the pandemic in Romania were studied to outline the possible perspectives of the housing market.

4. Research Methods

In this study, data on housing price, demand and supply as secondary data were used to provide the base of analysis and generalization of the prevailing situation in Romania before and during the Covid-19 pandemic. The data were collected from the databases of Eurostat, National Institute of Statistics (NIS), National Bank of Romania (NBR), ANCPI Agency and Imobiliare.ro. The price-to-income and

price-to-rent ratios and Hodrick-Prescott (HP) filter were calculated to explain the sustainability of the housing price development. The price-to-income ratio is a measure of affordability, while the price-to-rent ratio reflects the relative cost of owning and renting. The one-sided Hodrick-Prescott filter provides information about the price fluctuations in comparison to its stochastic trend and cyclical component.

5. Findings

5.1. Behavior of the Romanian housing market before the Covid-19 pandemic

In the period of the recession of Romania, marked by the transition from the planned economy to a market-based one, the communist housing legacies remained broadly unchallenged, but the post-2000 economic growth has stimulated the developing of the housing market (Soaita & Dewilde, 2019). Against the background of economic and financial development, the excessive growth of lending together with the unprecedented inflows of capital from abroad have contributed to the formation of a significant real estate bubble, characterized by speculative investments and unsustainable housing price increases (Bálint, 2020). Romania registered the fastest growth rate in housing prices in the region (Bálint, 2020), and the new housing construction exploded. According to the NIS data, in 2008, the number of new housing, built from own funds, was 143% higher than in 2004. Then, as sources of financing from abroad decreased appreciably due to financial turmoil, the real estate market collapsed and, as a result, the construction sector entered a period of decline. In 2009, the average real trading prices of housing fell by 27% compared to 2008 and continued to decline until 2014 (Figure 1). The number of real estate transactions reduced by 27% in 2009 compared to the previous year, while the real gross fixed investment in housing by 14% (EMF, 2019). Overall, the real house prices fell by 70% from 2008 to 2014, which represents a notable decrease among EU member states.

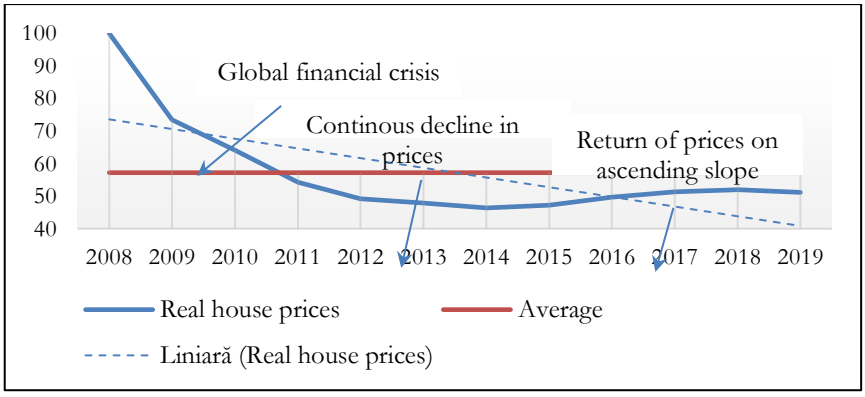


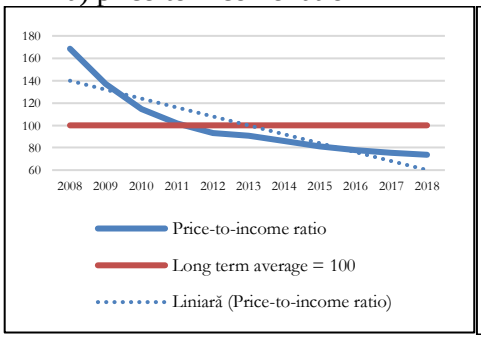
Figure 1. Romanian real house prices vs. long-run trend and average (2008=100)
Source: author's projection based on Eurostat data

The residential real estate market started to recover in 2015 when was registered a house price increase of 2% (in real terms) from the previous year, which continued to increase for four successive years, thanks to improving economic conditions. However, prices did not return to pre-crisis values, which is an evidence of price overvaluation in the pre-crisis period and a trend of price correction relative to the long-term market fundamentals. Figure 1 seems to suggest that Romanian real house prices have been above their long-run average and their long-run trend until the end of 2011, which indicates that the Romanian housing market might have been overvalued before the financial crisis. Although the real house prices since 2011 are, on average, by 7.3% below the long-run average, with the recovery of the real estate market in 2015, prices significantly exceed the long-run trend.

5.2. Evidence of unsustainable housing price movements

Figure 2 plots price-to-income and price-to-rent ratios compared to their long-run averages and trends. As seen from the figure, both ratios seem to signal overvaluation of the residential real estate prices during the years prior to the financial crisis of 2008. The deviations from the long-term averages of the price-to-income and price-to-rent were very pronounced, being about 60-70% higher than their long-term averages in the years before the crisis. In 2008, real house prices were twice as high as gross disposable income per capita and rental prices. Philiponnet and Turrini (2017) and Ionascu et al. (2018) identified similar values for the positive deviations from the long-run averages in Romania before the crisis, signaling the overrated housing prices relative to the levels of disposable income and rents.

a) price-to-income ratio



b) price-to-rent ratio

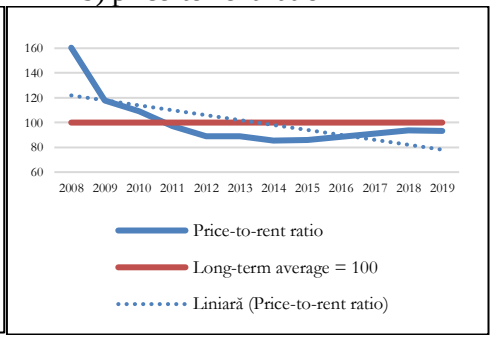


Figure 2. Housing price-to-income and housing price-to-rent vs. their long-run averages and trends in Romania
Source: author's calculation based on Eurostat data

Following the crisis, the price-to-income and the price-to-rent ratios decreased by 45% by 2011, reaching lower levels than their long-run averages, which maintained so until 2019. While the price-to-income ratio has been on a continuous

downward slope since the beginning of the crisis, the price-to-rent ratio has risen annually slightly by 3% beginning with 2016. Figure 3 presents the development of real household disposable income and real rents versus real house prices. After an extended period of negative or stagnant development between 2009 and 2014, real household disposable income continued to grow, while the real rents remained at a relatively constant level. Between 2014 and 2018, the real household disposable income per capita increased by 30% (on the average, by 6% per annum), while the housing prices with 12% (on the average, by 3% per annum). The figure shows that housing prices did not keep the pace with the increase in income during this period and that the disposable income increased considerably more than prices since 2015. This implies that an increase in household disposable income is not fully captured by the real housing prices and that other factors may contribute to the widening gap between housing prices and disposable income in recent years.

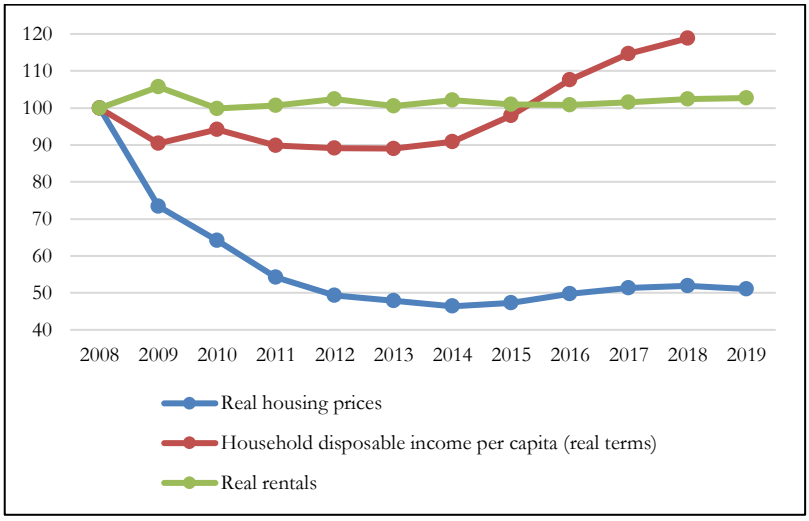


Figure 3. Real housing prices vs. disposable income and rents (2008=100)
Source: author's projection based on Eurostat data

The slight increase in Romanian housing prices since 2015 has been amplified by high demand, compared to the existing housing supply that is very limited. According to Eurostat data, 46.3% of Romanian population was living in overcrowded dwellings in 2018, compared to the EU average of 17.1%, and more than half of the existing dwellings is old, being built during the period 1946-1980. The demand for housing was also driven by the population's access to housing lending through the "First Home" program and by lowering interest rates on loans. After the crisis, the rate of charge on loans to households for house purchases was on a continuous downward slope until the end of 2017, when interest rates began to rise from one month to another.

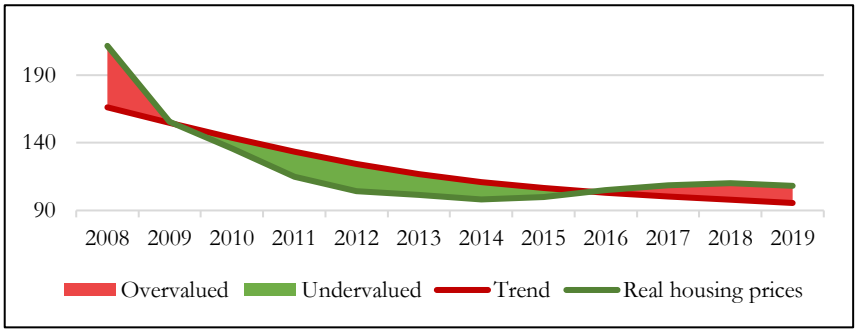


Figure 4. House price deviation from the HP filter
Source: author's calculation based on Eurostat data

The calculated HP filter reflects the same trends as price-to-income and price-to-rent ratios of pre-financial crisis price overvaluation by around 40% and of price undervaluation in post-financial crisis, on average by 14%, followed since 2015 by a stressed sharp rise in price of up to 20%, compared with its stochastic trend and cyclic component (Figure 4).

The emergence of the housing bubble in the early 2000s led to further house price inflation and a higher sensitivity of real estate markets to macroeconomic conditions. This implies that housing markets are set to be substantially impacted by the economic downturn due to Covid-19 (Allen-Coghlan & McQuinn, 2020).

5.3. Behavior of the Romanian housing market during the Covid-19 pandemic

The effects of the Covid-19 pandemic on the demand and supply of the real estate market were observed from the very beginning of March when Romanian authorities imposed the first restrictions to limit the spread of the new coronavirus. In the first weeks of the emergency state, the demand for the housing purchase and the number of homes listed for sale fell sharply, as, between March 9-29, the demand decreased by 70% and the number of apartments and houses put up for sale by 60%, while the housing prices remained unchanged, compared to the beginning of the month, in six major cities (Analizeimobiliare.ro, 2020). This dramatic decline in supply and demand in the housing market is mainly explained by the government's shutdown orders that restricted the operation of businesses and limited interactions among people. Against the background of the uncertainty generated by the coronavirus crisis, probably more buyers postponed the purchase of real estate until the economic outlook becomes clearer. Consequently, in April 2020, real estate transactions fell by 44% compared to March and by 33% compared to the same period of previous year, according to ANCPI (2020).

Given the particular nature of the restrictions imposed by authorities, the impact on the domestic labor market has been particularly severe, affecting the purchasing power of households. Unemployment, which in late February 2020 had been at 4.3%, in June had reached 5.3%, with many businesses in the retail, accommodation and food service activities, manufacturing and construction sectors

being forced to suspend or terminate the employment contracts of the more than one million employees. According to estimations of Almeida et al. (2020), throughout 2020, on average, households' disposable income in the EU would fall by -5.9% due to the Covid-19 crisis without discretionary policy measures, and by -3.6% with policy intervention, pointing that the impact is likely to be highly regressive, with the poorest households' being the most severely hit. Inevitably, this will have a significant impact on individual's abilities to pay rent, mortgages and various household expenditures (Nicola et al., 2020), given that in 2019, 8.6% of the Romanian population lived in households that spent 40% or more of their disposable income on housing, but the proportion was highest for tenants with market price rents (39.8%).

Because of social distancing precautions and uncertainty, both housing demand and supply, represented by builders and developers, had to reconsider their plans. The construction industry was slightly affected by the pandemic during the state of emergency, according to NIS data. About 15% of all employees laid off due to the pandemic were employed in the construction industry. Starting with February 2020, the volume of residential buildings decreased slightly, on average, by 5% monthly, until June, but compared to the corresponding periods of last year, the volume of construction works of residential buildings was net superior. As a result, in the first half of 2020, 29,765 dwellings were brought into use, growing by 2,561 units compared to the first half of 2019, increasing also the share of the number of housing built from private funds (NIS, 2020).

With the gradual resumption of activities, through the successive relaxation of restrictions imposed on the population for preventive purposes, the housing market reacted positively, so that both demand and supply of properties gradually recovered. While the demand and supply of housing reacted immediately to administrative closures, the effects on prices were delayed. The prices remained relatively constant during the state of emergency, but with the gradual relaxation, the listing prices for new and old apartments in the major Romanian cities began to decline slightly from one month to another, on average by 1-2% (Figure 5).

a) old apartments b) new apartments

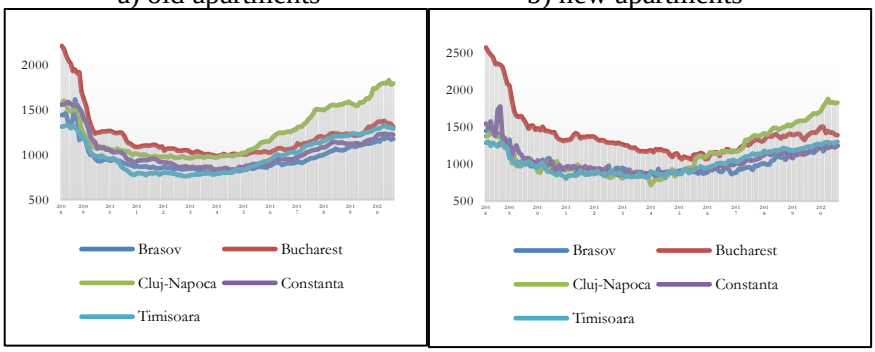


Figure 5. The monthly evolution of prices for new and old apartments in major cities in Romania, 2008 – 2020
Source: author's projection based on Imobiliare.ro data

Such effects on housing markets have occurred in most countries affected by the pandemic crisis, regardless of the intensity of virus spread or timing of the introduction of state level policies to combat the pandemic.

Although the data show that the Covid-19 epidemic did have a mildly negative effect on the housing market in Romania, the long-term impact of the pandemic on the real estate market will depend on the duration of the crisis and the effects of measures taken by authorities, such as job protection and income.

6. Conclusions

This research aimed to study the sustainability of the development of the housing market in Romania before and during the Covid-19 pandemic, taking into account the particularities of the behavior of housing demand and supply.

The post-2000 economic growth has stimulated the developing of the housing market in Romania. The economic and financial development, along with the excessive growth of lending and high inflows of capitals have contributed to the formation of a significant real estate bubble, characterized by speculative investments and unsustainable housing price increases. Following the crisis, house prices suffered a strong negative correction, which fell by 70% between 2008 and 2014 (in real terms). The market has recovered slightly since 2015, and beginning with 2016, under the demand pressure, it entered a new phase of expansion.

The effects of the Covid-19 pandemic on the housing demand and supply were observed from the very first weeks of the state of emergency when the population's interest in housing purchase and the number of homes listed for sale fell sharply. Social distancing precautions have reduced house views, while the economic uncertainty determined more buyers to postpone the purchase of a real estate, which led to a considerable decrease in the number of real estate transactions. While the demand and supply of housing reacted immediately to administrative closures, the effects on prices were delayed. The prices remained relatively constant during the state of emergency, but after the gradual relaxation, they began to decline slightly.

Although the data shows that the Covid-19 outbreak did have a mildly negative effect on the housing market in Romania, mainly at the beginning of the pandemic, the long-term impact will depend on the duration of the crisis and the effects of measures taken by authorities. For this reason, the real estate market must be closely monitored to identify on time the possible negative effects of the pandemic. Thus, this research topic remains open for further analysis to document the housing policy.

References

[1] Allen-Coghlan, M., & McQuinn, K. M. (2020). The potential impact of Covid-19 on the Irish housing sector. *International Journal of Housing Markets and Analysis*.

[2] Almeida, V., Barrios, S., Christl, M., De Poli, S., Tumino, A., & van der Wielen, W. (2020). *Households' income and the cushioning effect of fiscal policy measures during the Great Lockdown*. Seville: European Commission.

[3] Analizeimobiliare.ro (2020). *Romanian residential market report Q1 2020*. Bucharest: Analizeimobiliare, Imobiliare.ro.

[4] ANCPI (2020). *Statistics*. Retrieved from http://ancpi.ro/index.php/en/presa-2/statistici.

[5] Bálint, C. (2020). *Cum se compară criza din 2020 cu cea din 2008?* [How does the 2020 crisis compare to the 2008 crisis?]. Retrieved from http://opiniibnr.ro/index.php/macroeconomie/446-cum-se-compara-criza-din-2020-cu-cea-din-2008.

[6] Delgado, A., & Katafuchi, Y. (2020). *COVID-19, state of emergency, and housing market*. Retrieved from https://ideas.repec.org/p/pra/mprapa/102456.html.

[7] D'Lima, W., Lopez, L. A., & Pradhan, A. (2020). *COVID-19 and Housing Market Effects: Evidence from U.S. Shutdown Orders*. Retrieved from https://ssrn.com/abstract=3647252.

[8] EMF (2019). *Hypostat 2019: A review of Europe's mortgage and housing markets*. European Mortgage Federation.

[9] Del Giudice, V., De Paola, P., & Del Giudice, F. P. (2020). COVID-19 infects real estate markets: Short and mid-run effects on housing prices in Campania region (Italy). *Social Sciences*, 9(9), p. 114.

[10] Huang, N., Pang, J., & Yang, Y. (2020). *The Impact of the COVID-19 Epidemic on the Housing Market in China*. Retrieved from 10.2139/ssrn.3642444.

[11] IMF (2019). *Global financial stability report: vulnerabilities in a maturing credit cycle*. Washigton: International Monetary Fund.

[12] NIS (2020). *Construction of dwellings (provisional data)*. Bucharest: National Institute of Statistics.

[13] Ionascu, E., Mironiuc, M., & Anghel, I. (2018). Housing market dynamic in Central and Eastern European countries: a comparative study. *The Valuation Journal*, 13(1), pp. 35-77.

[14] Liu, S., & Su, Y. (2020). *The Impact of the COVID-19 Pandemic on the Demand for Density: Evidence from the U.S. Housing Market*. Retrieved from https://doi.org/10.24149/wp2024.

[15] Mihaela Soaita, A., & Dewilde, C. (2019). A Critical-Realist View of Housing Quality within the Post-Communist EU States: Progressing towards a Middle-Range Explanation. *Housing, Theory and Society*, 36(1), pp. 44-75.

[16] NBR (2017). *Financial Stability Report, May 2017*. Bucharest: National Bank of Romania.

[17] NBR (2020). *Financial Stability Report, June 2020*. Bucharest: National Bank of Romania.

[18] Nicola, M. et al. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International Journal of Surgery*, 78, pp. 185-193.

[19] Philiponnet, N., & Turrini, A. (2017). *Assessing House Price Developments in the EU*. Luxembourg: Publications Office of the European Union.

[20] Tanrıvermiş, H. (2020). Possible impacts of COVID-19 outbreak on real estate sector and possible changes to adopt: A situation analysis and general assessment on Turkish perspective. *Journal of Urban Management*, 9(3), pp. 263-269.

[21] Yörük, B. K. (2020). *Early Effects of the COVID-19 Pandemic on Housing Market in the United States*. Retrieved from https://ssrn.com/abstract=3607265.

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Business Incubators and Business Champions as Key Drivers for Entrepreneurship Initiative

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Răzvan-George COTESCU[3]

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Abstract

The paper highlights the importance of business incubators for supporting entrepreneurship initiatives on their road towards performance and success in business as business angels and business champions. We live in quite interesting times where unexpected changes seem to become the "single constant" of the universe. Thus entrepreneurs and mostly young people belonging to generation Millennials and generation Z have to discover and rediscover new performant models to support business performances. Business excellence becomes a "need" within our turbulent, dynamic and challenging times. Promoting a culture of excellence based on the management of diversity and stimulating the creative and innovative potential of all the people within an organization become crucial factors for success mostly for knowledge and innovative-based organizations while also promoting a broad vision of innovation such as "open" innovation. Mostly generation Z, also called digital generation, prefers to actively interact based on online collaborative platforms. Our paper supports the idea of collaboration in education, research and mostly within the modern business framework. The paper is authored by an international team, the first two co-authors working and interacting within the Master of Business Programme of FABIZ-ASE under the auspices of the course "Innovative Management". This co-operation was further developed during the time spend by the first author of the paper as a visiting professor at the Sapienza University of Rome, Faculty of Economics in November-December 2019. The second co-author is a member of the Doctoral School of Management, Banking and Commodity Sciences and of the Management Department of the same Faculty. The third co-author is a PhD candidate at Bucharest University of Economic Studies, Economics 1 Doctoral School.

Keywords: business incubators, business champions, business excellence, culture of excellence, generation Z, entrepreneurship, business intelligence.

JEL Classification: J01, E2

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1. Introduction

In a competitive and constantly developing market, a priority at the level of the European Union, but also an essential component of the national strategies is to support the development of the business environment. As a consequence, this induces a series of challenges that present opportunities for the large-scale promotion of new forms of innovation, consisting in modern approaches specific to the concept of open innovation.

Innovation is one of the key factors in achieving, maintaining and developing a sustainable competitive advantage in the medium and long term, with direct effects propagated to increase productivity, improve employment and other specific performance indicators (Neely & Hii, 1998).

Some authors (Sepuvelda, 2013) explicitly mention the inclination of economic actors who operate and interact in business incubators to use the specific prerogatives of the innovation concept, providing the necessary elements to propagate this favourite phenomenon in the field of innovative start-ups.

The assistance for young people in starting a business by ensuring that they can benefit from the resources available at a local community level, as well as an appropriate infusion of capital and advice may have a positive impact, especially on the medium and long term. This is expected to lead even in the short-term to obtaining and maximizing profits, but also to obtaining significant value added on the basis of intangible assets and, in this case, intellectual capital (Bruneel, Ratinho, Groen, & Clarysse, 2012).

Our work aims to first outline an updated map of the Romanian incubators' characteristics and to identify some of the peculiarities of the incubated start-ups. Subsequently, a brief best practice guide of the national business incubator environment is presented, based on a critical comparison between the Romanian and Italian main characteristics of business incubators.

The mainstream of the economic literature deals extensively with innovative start-ups and incubators business models.

In particular, numerous pieces of research have focused on identifying different incubation models and evaluating their economic effects.

However, we consider that the existing realities, together with the diversity of methodological approaches used makes it difficult to compare the results obtained in the literature regarding the effectiveness of incubators.

2. Brief literature review

Entrepreneurship is at the heart of sustainable growth for both developed and developing economies, and incubators often served as catalysts for cluster formation and entrepreneurial development. Small businesses are one of the largest job creation segments of an economy, even if only a few succeed in this in their early years.

Business incubators are one of the most important and successful mechanisms for SME (Small and Medium Enterprises) business development and support to deal with economic threats and obstacles (Carayannis & Zedtwitz, 2005). The same

authors also state that innovative start-ups would generate positive outcomes, consisting of stimulus to innovation and change of technological paradigms that promote out-of-the-box thinking and business, thus favouring the economic system as a whole.

Economic impact through specific entities – incubators precisely – are supposed to support businesses and seem to make them less vulnerable, which is mostly relevant and significant within the early stages of their life.

According to the NBIA, the main purpose of a business incubator is to generate successful incubated businesses, which is expected to leave the program in a viable and self-sufficient financial state. They have the potential to create jobs, revitalize areas and develop new technologies or even promote innovative business models.

Business incubators also encourage entrepreneurship in the community and increase the survival rate of reputable businesses. Ultimately, local and national economies greatly benefit from the support that is offered to individual entrepreneurs.

Throughout many countries, although characterized by significant differences in the institutional, economic and cultural contexts, incubators are considered instruments of public intervention (national and/or regional), aimed at pursuing objectives of economic policies:

- *At the macroeconomic level*, to promote the economic development of an area, the job creation and entrepreneurial initiative
- *At the microeconomic level*, to increase the survival rate of Innovative Start-Ups.

According to (Grimaldi & Grandi, 2005), the majority of the incubators are non-profit organizations and largely dependent on public resources, although in some economies these entities are managed according to business logic and public contributions are supplemented by private funds, as well as from the income generated by incubation services.

There are cases of incubators that are fully financed by private entities, mostly attributable to large high-tech companies (which thus encourages the development of innovative activities) or venture capitalists.

However, it should be noted that even in the United States, where the presence of private incubators is significant, a significant percent benefit from public funding (of federal, local or state origin) and only a small portion is totally financed by profit organizations. Most institutions share the idea that entrepreneurs are supported for a limited period of time, after which the Start-Ups may become self-sufficient or even fail.

Entrepreneurship and entrepreneurial education are nowadays two closely related concepts, due to the increase of technological advancement and the increase of competitiveness.

In this context, business excellence is greatly influenced by the quality assurance and the promotion of a well-articulated set of values, including by implementing the principles of CSR (Corporate Social Responsibility). All the entities participating in

the educational process for entrepreneurship suggested a set of values that later revealed their result in the economic environment, by promoting innovation, excellence and culture of excellence in business (Trow, 1994).

With regard to the effectiveness of incubators and their economic effects in general, the results obtained in literature are not unique.

Furthermore, the works are very heterogeneous from the point of view of the sample size (from case studies on a few companies and / or incubators to works related to a few hundred companies), techniques used to collect information (direct qualitative interviews, questionnaires, etc.) and methods of analysing the data collected (qualitative and SWOT analysis, quantitative techniques).

Some authors (Al-Mubaraki & Busler, 2010) stated that a quite significant number of studies illustrate that the incubation activity is expected to have positive effects on:

- *Macroeconomic variables* such as:
  - The rate of economic development
  - Job growth rate
  - The rate of adoption of the new technologies
- *Microeconomic variables* such as:
  - The survival rates of start-ups
    - 1-Year survival rate
    - 5-Year survival rate
  - Growth rates of Incubator and Start-Up Revenues
  - Percentage of High-Growth Companies
  - Qualified Exits

This part of our paper consists of an overview of the most relevant works identified within the scientific literature in the field of the topic of business incubators, business champions and business excellence. The literature review is presented as a synthesized approach, including the most important references to the topic by highlighting the state of art within the scientific literature.

3. The main evolution of business incubators in Romania

Chronologically, the evolution of incubators in Europe has followed several milestones.

- *The origins of business incubators* can be traced back in the late seventies, during the phase that marked the transition from an economy based on traditional industry to one characterized by the growing importance of information and communication technologies.
- *Subsequently*, in the eighties incubators were viewed as an economic policy tool to respond to ongoing macroeconomic changes and stimulate entrepreneurship and the creation of employment after the recession.

  This is perhaps the most dynamic and significant phase of the evolutionary path of business incubators, which not only regarded the number of initiatives,

but also recorded an increase in investments by a plurality of actors, such as governments, academic institutions and businesses.

- *The third stage* dates back to the 1990-2000, in which the development of the ICT sectors stimulated the growth of so-called industry incubators, focusing on emerging technologies.
- *Finally*, from 2000 until today, with a quite rapid increase rate over the recent years, the evolution of a new type of incubator is represented by a hybrid between an incubator and an accelerator. This is *the emerging model today*, mainly followed by *virtual incubators*. This type of incubator associates the seed capital offering additional services in terms of physical, technological and managerial infrastructure specific to the sector in which it operates.

In Romania, the concept of Business Incubators is relatively recent, with the first successful BI's appearing in the last 15 years.

For the Romanian economic environment, the Start-Ups carrying out economic activities inside the incubators, depending on their specificity, are able to benefit from business support regarding:

- Managerial advice and constant cooperation of incubated companies
- Access to training services for current and future market needs
- Professional legal and accounting services
- Collective purchasing of services and products
- Access to non-governmental funds for economic development
- Access to sources of financing or investments
- Contacts with individual investors, venture capital funds, business angels
- Technology transfer and marketing
- Contacts with universities and research and development institutes
- Internationalization services for small and medium enterprises
- General space management services.

In the EY study on the Romanian Start-up Activity, (Carstoiu, 2020) notes that 1 out of 2 Romanian Start-ups are in business for less than 12 months, while almost a third do not live to see their second year of activity. More than 75 percent of the start-ups have a turnover of less than 50,000 Euros, while only 1 percent had exceed the 500,000 Euros threshold. The majority of the investigated subjects are aged between 22-35, while there is a very low percentage for the founders aged over 50 years old. Almost all the studies provided are showcasing an inexperienced and relatively young incubator environment, which leads us to develop a best practice guide for the Romanian entrepreneurs, based on the feedback and the results obtained.

The Romanian Business Incubators should help companies indirectly by placing the entrepreneurial actor in a professional environment of colleagues, resources (network) and psychological support between tenants. It should help companies directly, through affordable rents, services and equipment that would otherwise be

unavailable or inaccessible. It can also help the entrepreneur gain legitimacy by improving tenant visibility and credibility.

4. The main evolution of business incubators in Italy

The incubator promotion and development process saw the involvement of multiple territorial actors, public or private.

We mention only some of these actors, such as: government premises, universities, science parks, chambers of commerce, banking foundations and even large companies. The political and economic characteristics of the territory in which the incubator also arises, have exercised a significant influence on its formation, evolution and growth. Therefore, a single incubator model seems to be not applicable.

In Italy the birth of the first incubators took place in the eighties at the initiative of public sector, in order to promote entrepreneurship and economic development in the most disadvantaged areas of the country.

With over 40 Certified Business Incubators among all the regions, Italy comprises more than 11,000 Innovative Start-ups and has at least one in each of the country's 1414 municipalities, showing a great territorial distribution. In his report regarding the development of *the Italian Start-up Program*, the *Minister of Economic Development*, (Calenda, 2018) presents the following analysis:

- The number of innovative SME's has a double digit yearly growth for the last 5 years
- Nearly 40% of companies currently registered as innovative SMEs were formerly innovative start-ups
- The survival rate of innovative start-ups is very high. To date, more than 80 percent of the Start-ups recorded since 2012 are still in business
- 21.5% of innovative start-ups have a majority of shareholders below 35 years of age, a percentage more than triple the average of other limited companies (6.7%)
- Four innovative SMEs out of 10 registered sales exceeding 1 million euros
- Innovative start-ups invest on average significantly more than other companies, especially in intangible assets: their rate of fixed assets on net assets (25%) is eight times higher than other Italian limited companies

By correlating the values and principles promoted by NBIA regarding the principles of business incubators with the highest rated incubators in Italy and their best practice examples, we can notice a commitment to a number of principles that have the above-mentioned positive impact on the economy. These may be briefly summarized as follows:

- Inclination towards open innovation and Innovative Start-Ups
- A clear mission to define the role of the incubator in the community (Social Inclusion)
- A realistic business plan that stimulates CSR for the incubated companies

- Focus on providing the client with assistance, counselling and guidance to support fast company scaling and wealth creation
- Adaptability towards each business model
- Integration of the program and activities in the local, regional or national community
- Development of a network of resources to support incubates
- Creating highly collaborative teams to achieve Business Excellence
- Smart business benchmarking methods (Using non-traditional KPI's).

5. Romania and Italy. A critical comparison analysis of Business Incubators

Business incubators were created mostly in order to support viable business ideas and to help entrepreneurs get their businesses through critical stages in the life of their new companies. They are an important lever for launching local entrepreneurial initiatives that can have a significant impact on the economy of country. As synthesized in the literature study, a solid network of incubators that nurtures companies aiming towards Business Excellence and sustainable growth must follow a new model approach and use relevant ways of benchmarking.

In the following table, we present a brief comparison that resulted after evaluating the characteristics of each country's business innovation environment.

Romania	Italy
○ Relatively new concept ○ Classic Incubating Services Provider ○ Small Seed Funding ○ 50% of the Start-Ups fail after the first year ○ Start-Ups tend to enter classical economic sectors ○ Classic Business Plan ○ Uniformity of facilities provided, regardless of the business model ○ Traditional Benchmarking Assessment ○ Younger Shareholders, mostly private persons ○ Tech Industry-Oriented ○ 75% of the incubated Start-Ups report turnovers of 50,000 Euros or less	○ Established around the 1980's ○ Inclination towards Open Innovation ○ Large Investments towards Innovative Start-Ups ○ Less than 20% of the Start-ups fail after 3 years ○ Newly incubated companies enter emerging sectors ○ Business Plan includes CSR in many new Start-Ups ○ Adaptability towards different business models ○ Smart Business Benchmarking (using new and relevant KPI's) ○ Community integration and Social Inclusion ○ High Investments in Innovative Start-Ups ○ Highly Collaborative Teams, leading to BE

Source: Designed by authors

The development of the Romanian business incubators in the recent years is remarkable and it shows great potential, especially through its young average age of Start-Up founders. This provides opportunities towards developing its intellectual capital, by stimulating innovation through forward-thinking entrepreneurial education. Value added could thus be achieved, resulting in greater initial investments and an easier access towards Series A or B funding.

6. Conclusions

Besides the core purpose of business incubators, they represent a way of capitalizing on the results of scientific research and encourage the transfer of advanced technology to the industry.

In addition to the impediment represented by the lack of financing possibilities, start-up companies also face the lack of permanent technical support from specialists to be alongside young entrepreneurs in the incipient development of the business. For this reason, business incubators represent a support.

Achieving Business Excellence through the development of an inclusive and sustainable network of incubators that promote successful and socially-aware Innovative Start-Ups is possible by following a set of smart principles. The limitations in this study are represented by the relatively new business incubators (BI) environment in Romania and the subjectivity of the impact they have in the economic environment, as noticed also by the authors in the literature review.

After conducting the analysis of the evolution of business incubators in Romania and Italy and conducting a critical comparison between them, we developed a brief guide of best practices and recommendations for developing a sustainable entrepreneurial environment, with an impact on the micro, mezzo and macroeconomic level. In order to achieve Business Excellence through Business Incubators, the recommendations are as follows:

- Encouraging new forms of innovations, such as Open Innovation
- Socially-Inclusive Business Plans and Models
- Promoting CSR (Corporate Social Responsibility)
- Mandatory development of MVP (Minimal Viable Product)
- Aggressive scaling of Validated Business Models
- Encouraging Highly Collaborative Teams
- Developing Collaborative Platforms for young entrepreneurs
- Smart Business Benchmarking for BIs:
    - Percentage of Jobs Sustained
    - Self-Generated Revenues
    - Number of Coaching and Mentoring Hours
    - Amount of Total/Average Investments Attracted
    - Dimension of Network (Number of Partners/Events)
    - Number of Qualified Exits
    - 1 or 5-Year Survival Rate
- Promoting Early-Adoption of New Technology

- Individual Adaptability on Business ModelsEmphasizing a Long-Term Vision of the Social Impact

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References

[1] Al-Mubaraki, H., & Busler, M. (2010). The Incubators Economic Indicators: Mixed Approaches. *Journal of Case Research in Business and Economics*, pp. 1-9.

[2] Bruneel, J., Ratinho, T., Groen, A., & Clarysse, B. (2012). The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations. *Technovation*, pp. 110-121.

[3] Calenda, C. (2018). *Annual report to Parliament on the implementation and impact of legislation in support of innovative start-ups and SME's.* Roma: Ministry of Economic Development.

[4] Carayannis, E., & Zedtwitz, M. (2005). Architecting gloCal (global-local), real-virtual incubator networks (G-RVINs) as catalysts and accelerators of entrepreneurship intransitioning and developing economies: lessons learned and bestpractices from current development and business incubation. *Technovation*, pp. 100-110.

[5] Carstoiu, C. (2020). *Barometrul afacerilor de tip Start-up din Romania.* Bucharest: EY.

[6] Grimaldi, R., & Grandi, A. (2005). Business incubators and new venture creation: an assessment of incubating models. *Technovation*, pp. 111-121.

[7] Neely, A., & Hii, J. (1998). *Innovation and Business Performance.* Cambridge: University of Cambridge.

[8] Sepuvelda, F. (2013). The Difference Between a Business Accelerator and a Business Incubator? *Tehnology Hampton Roads*, pp. 1-14.

[9] Trow, M. (1994). Academic reviews and the culture of excellence. *Institute of Governmental Studies*, pp. 1-31.

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Romanian Business Students' Migration Intentions. An Empirical Analysis of Perceptions and Motives

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Abstract

Skilled labour mobility is one of the most acute problems in the European Union and especially in Central and Eastern European countries including Romania. Adjacent to positive effects, it is becoming increasingly clear that the migration of young graduates of tertiary education produces negative effects on the structure of the labour market, which is reflected in the ability to increase the competitiveness of the national economy. In this context, policies for the retention of highly qualified young people are more than mandatory for every country facing a massive migration phenomenon. This sort of policy could be effective only if it takes into account the motivations, interests and expectations of young people who are considering seeking employment abroad. Along these lines, the present study focuses on the analysis of students' opinion on the intention and reasons for migration. Analysing data from a survey (N = 429 students) our research attempts to reveal the differences in perception among young people about the peculiarities and opportunities of the labour market in Romania and abroad (wage, job accessibility, tax facilities, social incentives, etc.). The analysis also seeks to identify the most important incentives that influence young people's decision to seek employment abroad. The analysis reveals that reasons related to the opportunities they can find on the labour market and the feeling that the labour market is much more mature abroad are important. Moreover, the study shows that a number of small changes in public policy (providing economic and social incentives) can influence young people's decision to emigrate.

Keywords: labour migration, brain drain, incentives, tertiary education.

JEL Classification: I25, J61

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1. Introduction

The term "braindrain" was coined by the British Royal Society in the 1960s to describe the phenomenon of highly skilled labour migration, with clear mention of the migration of British researchers and technicians to USA and Canada (Cervantes and Guellec, 2002). Currently, the migration of highly skilled labour is a major challenge, particularly for developing countries, as the brain drain limits the ability of a weak economy to maintain and increase its human capital stock, which is essential for growth economic. For instance, Docquier et al. (2010) constructed and calibrated an overlapping generation model (OLG) of the world economy, divided into 10 regions, in order to observe the brain drain effects in the countries of origin. They noted that the main impact generated is the loss of the innovation capacity of nations that provide highly skilled labour for others (Docquier et al., 2010).

On the other hand, it has also been reported over the years that developed countries actively implement policies that attract highly skilled labour. For example, Canada and Australia have applied policies to attract immigrants based on skill level and adaptability to the work environment (Commander et al., 2003). A series of studies indicate that currently almost one in four adults with higher education, born in an underdeveloped or developing country, lives in the developed world (Docquier and Iftikhar, 2019). This means that the country of origin has been deprived of the resources needed to stimulate healthy economic growth. At the same time, destination countries benefit from increased mobility of skilled workers, but the biggest beneficiaries of the brain drain phenomenon are nevertheless skilled migrants (Gibson and McKenzie, 2010).

A significant series of scholars consider that "almost all models [related to migration potential] discussed in the empirical literature explain migration through income and employment opportunities in those countries and take into account a set of institutional variables that should capture different types of restrictions on migration and [...] country-specific elements, such as geography, language and culture "(Alvarez-Plata et al., 2003). At the same time, experts are trying to find different types of explanations regarding the causes, effects, externalities and characteristics of this phenomenon that has become very important in size specifically in the last century (Pociovălișteanu and Badea, 2012).

In recent years the migration of young people and Romanian skilled labour has increased, amid imbalances in the labour market and economic outlook. Usually, migrants are looking for better living conditions and real opportunities for professional assertion. The phenomenon of labour migration began lightly in the first half of the 1990s, grew steadily in the second half of the decade and exploded after 2000 (Pociovălișteanu and Badea, 2012). A turning point in the evolution of external migration was represented by the year 2002, which marked the beginning of the free movement of Romanians in the Schengen area. It is associated with a much more dispersed migration than in the past, with flows directed to more destinations and with a much more balanced share of the different currents within the total emigration (Pociovălișteanu and Badea, 2012).

Along these lines, the present study focuses on the analysis of Romanian business students' opinion on the intention, incentives and reasons for migration. Using survey data (N = 428 students) the current research attempts to explore and reveal the opinions of young people on the peculiarities and opportunities of the labour market in Romania and abroad (wage, job accessibility, tax facilities, social incentives, etc.). More importantly, the analysis seeks to identify the most notable reasons and potential benefits that influence young people's decision to seek employment abroad.

2. Literature review

There is a significant body of research which reveals that the brain drain phenomenon can be viewed from several perspectives. Thus, a more recent part of the literature has identified positive spin-offs of skilled emigration, focusing on issues related to education, remittances or externalities related to the diaspora (Docquier and Rapoport, 2012).

Several studies so far focused on the link between brain drain and economic development. Thus, among the pioneers in the field, in the 1960s we can mention the research conducted by Grubel and Scott (1966) or Berry and Soligo (1969), which concentrated on the implications that brain drain might have on the countries of origin. The theory of the 1970s and 1980s focused mainly on the negative effects resulting from the actual loss of highly qualified human capital. Period-specific research has focused on the analysis of fiscal and aggregate productivity losses (Bhagwati and Hamada, 1974; Bhagwati and Rodriguez, 1975; Rodriguez, 1975; McCulloch and Yellen, 1977; Miyagiwa, 1991; Haque and Kim, 1995). Studies in the mid-1990s already nuanced the implications of the phenomenon, focusing on ambiguous effects (Mountford, 1997; Stark et al., 1998; Beine et al., 2008) and highlight a number of externalities due to the presence of the diaspora in developed countries (Docquier and Rapoport, 2012).

Moreover, authors highlighted, among other things, the fiscal imbalances that the brain drain could generate. As over 70% of the costs of education in developing countries are financed from public sources (World Bank, 2009), one can notice that the decision to invest in human capital is not completely private, and the loss of human capital generates externalities. If the government finances education hoping to increase its future tax base and possibly increase funding for education in the future, then emigration clearly leads to a loss of future government revenue and a reduction in funding for future public education. Based on such considerations, Bhagwati and Dellalfar (1973) proposed a special income tax imposed on migrants by their countries of origin to compensate for this tax loss. Following this argument, Desai et al. (2009) examine the tax loss generated by the brain drain in the IT sector of India, being chiefly concerned about the loss of government revenue due to a low tax base. The study concludes that the loss is between 0.5 and 1% of India's gross national income (Desai et al., 2009). Additionally, Zhang (2001) quantifies the size of the brain drain effects on China's economy and shows that it lost about $ 4-5 billion annually due to the high emigration rate from 1978-1997.

Going further, Gibson and McKenzie (2010) conducted a study targeting 5 countries with high emigration rates and showed that individuals invest in skills that can help them emigrate in the future. In Ghana, for example, individuals enrol in English language courses and SATs and change their school curricula to increase their chances of working or studying abroad. In the same spirit, Shrestha (2011) uses a natural experiment, resulting from the change in policy by the British army that established a minimum level of education for recruits in Nepal, to study the effect of increasing the prospects of emigration of skilled workers on investment in education. The author finds a 30% increase in school years or an average increase of 1.1 years (Shrestha, 2011).

The empirical analysis conducted by Docquier and Iftikhar (2019) suggests that the emigration of the highly qualified increases their income and formal level of employment, while the welfare of those with a low level of qualification decreases, welfare losses being extremely heterogeneous between countries. This heterogeneity is largely governed by differences between countries in training technology and the relative productivity of the informal sector (Docquier and Iftikhar, 2019).

A very important issue, studied in the literature, concerns the factors that influence brain migration. Thus, Borjas (1994) and Hatton and Williamson (2005) include among the determining factors: the wage gap between the source country and the destination country; poverty, inequality and demographics in the source country; cultural similarity and geographical proximity between the source country and the country of destination.

On the other hand, one should bear in mind that the migration of highly skilled labour goes together with gains for the country of origin. As shown by Beine et al. (2008), migration prospects increase expected returns on investment in human capital. Kugler and Rapoport (2007) find evidence that networks of highly skilled immigrants promote foreign direct investment, and Lodigiani (2008) finds that they facilitate the diffusion of technology. Moreover, Li and McHale (2006) argue that those in the diaspora facilitate the implementation of institutional reforms. Fan and Stark (2007) show that brain drain can be really harmful to the country of origin in the short term, but these costs can be offset by the long-term benefits. Cinar and Docquier (2004) show that remittances sent by migrants to their countries of origin are of considerable size. At the same time, among the advantages we can observe: additional knowledge and skills brought by returnees in the country of origin (Dos Santos and Postel-Vinay, 2003), intensification of trade relations by creating new business networks (Mesnard and Ravallion, 2001), increased foreign investment etc. We must not forget the effects that this phenomenon has on host countries. Thus, negative effects can be observed such as the agglomeration of good universities in the host country or the emergence of linguistic and cultural barriers between people born in the host country and immigrants. Among the positive effects are the intensification of research and development, the intensification of economic activity due to additional resources of highly qualified work, know-how transfers, the development of study programs by enrolling a large number of students (Regets, 2007).

3. Research Methods

The analysis of the literature reveals that brain drain migration is the result of a complex decision-making process that depends on a series of dynamic factors of an objective and subjective nature. In this context, the current study aims to explore, on the one hand, migration incentives for students and, on the other hand, the reasons behind the decision to migrate for Romanian students. Given the objective of the study, the analysis is based on two major research questions: (1) To what extent do students consider the possibility of migration? and (2) What are the factors of an objective and subjective nature that influence the decision to migrate?

The empirical analysis is based on survey data which were collected via an online questionnaire randomly administered to students from the Bucharest University of Economic Studies. Respondents were allowed to opt out of filling the questionnaire and no incentives were offered for contributing to this study. Moreover, the respondents were informed that the data provided is used to examine students' migration intentions and incentives. The total number of respondents who contributed in this survey is 429 bachelor and master students, which provides a maximum margin of error of approximately 5% ($p < 0.05$) to the total reference population (27598). While this analysis is rather exploratory and primarily aims to detect significant trends, we consider that the sample is suitable to provide an understanding of students' migration intentions and motives.

The study uses the following metrics: (1) the potential intention to migrate; (2) the impact of studies for better job opportunities abroad; (3) the impact of studies for better job opportunities in Romania; (4) 8 metrics that assess the main incentives to seek a job abroad (higher revenue, higher economic standards; higher purchasing power; better quality of life; higher social security; better healthcare; better work environment, job market flexibility); (5) 8 variables that evaluate the potential benefits of migration (easy social integration, more efficient use of abilities and skills, higher professional opportunities, higher personal opportunities, better social behaviour, better compliance to rules and regulation, better social attitudes, more efficient society overall).

For optimum comparability and easy use of data, it was used a 5 point Likert scale with values from 1 ("Not at all") to 5 ("To a great extent") for all variables. The confidence and internal consistency were validated through the Cronbach alpha coefficient, whose value (0.83) is above the accepted level (0.7). In addition we used a variable that assesses the extent to which the decision to migrate could be influenced by an increase in potential revenue level (the following values were used: 25%, 50%, 75%, 100% or 150% increase from current level)

Descriptive statistics of the collected data are presented in Table 1.

Table 1. Summary statistics of variables

	Variable	Obs	Min	Max	Range	Mean	SD	VAR	Kurtosis	Skewness
V1	potential intention to migrate	429	1	5	4	2.84	1.16	1.35	-0.78	-0.03
V2	impact of studies for better job opportunities abroad	429	1	5	4	3.69	1.00	0.99	0.31	-0.73
V3	impact of studies for better job opportunities in Romania	429	1	5	4	3.87	0.95	0.91	0.64	-0.84
V4	Potential incentives to seek a job abroad									
V4.1	higher revenue	429	1	5	4	4.26	0.82	0.67	2.88	-1.42
V4.2	higher economic standards	429	1	5	4	4.12	0.83	0.68	2.12	-1.18
V4.3	higher purchasing power	429	1	5	4	3.84	0.91	0.83	0.48	-0.70
V4.4	better quality of life	429	1	5	4	4.17	0.93	0.87	1.84	-1.30
V4.5	higher social security	429	1	5	4	3.90	0.97	0.94	0.14	-0.75
V4.6	better healthcare	429	1	5	4	4.10	0.93	0.87	0.98	-1.05
V4.7	better work environment	429	1	5	4	3.70	1.05	1.11	-0.09	-0.60
V4.8	job market flexibility	429	1	5	4	3.93	0.92	0.85	0.69	-0.86
V5	Potential benefits of migration									
V5.1	easy social integration	429	1	5	4	3.27	1.01	1.02	0.64	-0.69
V5.2	more efficient use of abilities and skills	429	1	5	4	3.64	0.96	0.92	1.04	-0.76
V5.3	higher professional opportunities	429	1	5	4	3.92	0.96	0.92	1.49	-1.05
V5.4	higher personal opportunities	429	1	5	4	3.71	1.08	1.17	0.81	-0.97
V5.5	better social behaviour	429	1	5	4	4.03	0.98	0.97	2.01	-1.30
V5.6	better compliance to rules and regulation	429	1	5	4	4.10	0.90	0.81	2.39	-1.28
V5.7	better social attitudes	429	1	5	4	4.00	0.93	0.86	2.07	-1.20
V5.8	more efficient society overall	429	1	5	4	4.11	0.84	0.71	2.77	-1.26
V6	potential revenue level	429	0	5	5	2.34	1.40	1.96	-0.56	0.06

Source: Authors' own calculations

4. Findings

The primary analysis based on descriptive statistics provides a basic understanding of the main trends on students' migration and allows us to have a first overview of some interesting results. First of all, one can notice that the intention of Romanian students to migrate (at least when they participated in the study) slightly exceeds the average. It is worth mentioning that this result seems to contradict to some extent the popular perception according to which the majority of young Romanians are determined to emigrate, as well as previous results that supported this idea. At least, in the case of brain drain as part of the migration phenomenon, it is perceptible that there is a balanced opinion among students in favour of looking for

a job abroad. On the other hand, in terms of public policies and national economic competitiveness, this result is not necessarily promising. The fact that the opinion in favour of labour migration is slightly above average shows that there are potential risks for these opinions to materialize, which would affect the national economy. As previously mentioned in the literature review, the migration of the skilled youth can have negative effects on productivity (Haque and Kim, 1995), but also fiscal imbalances (WorldBank, 2009).

Going further, the study explores the students' opinion about the potential correlation between the level of education and finding a better job. The opinion of the respondents is quite clear: the education level enhances the opportunity to find a better job both in the country and abroad. This result confirms previous studies that show a positive correlation between human capital investment and labour market success (Kugler and Rapoport, 2007) and reinforces the idea that there is a constant need to invest in human capital. It seems that young people are aware that success in the labour market depends directly on investing in human capital, and the high level of education contributes to getting a better job. Another interesting result from the analysis is that it seems that students are convinced that their level of education contributes more to finding a better job in the country than abroad. This result is encouraging as it reveals that the Romanian labour market is perceived by young people as a market in which a high level of acquired skills and abilities is needed.

Our study also investigates potential reasons that may influence the migration decision of Romanian students. According to the literature review, 8 potential reasons were analysed: revenue, economic standards; purchasing power; quality of life; social security; healthcare; work environment and labour market flexibility. It should be noted from the start that all the previously mentioned reasons seem to be important in the decision to emigrate (in all eight cases the average value is above 3). As expected, the main reason for the migration decision is the opportunity to earn a higher income. This result confirms both popular opinion and a number of previous studies that show a strong correlation between income levels and migration of skilled labour (Alvarez-Plata et al., 2003; Docquier et al., 2010). In addition, a higher economic standard is also a strong reason for the decision to migrate. Moreover, just as important as the material aspect seems to be the one that refers to the quality of life. Respondents identify the potential for a higher quality of life as a reason as important as income or a high standard of living. To the quality of life is added the potential to benefit from a better health system as an important reason in the decision to emigrate. The reason that matters less seems to be the one related to the work environment. This result can be explained by the fact that respondents do not seem to be convinced that the work environment is better abroad than in Romania.

In terms of potential benefits that may influence the migration decision of Romanian students, our study identifies and analyses 8 potential benefits of migration that respondents may perceive: easy social integration, more efficient use of abilities and skills, higher professional opportunities, higher personal opportunities, better social behaviour, better compliance to rules and regulation, better social attitudes, more efficient society overall. As previously observed, in this

case the results emphasize that students' perception related to what they can acquire via emigration plays an important role in the decision to emigrate. First, respondents reported a positive perception of how society works as a whole abroad. This positive attitude plays an important role in the decision to emigrate. It seems that Romanian students are interested in working in an environment where the social attitude is positive, people behave civilly and the rules are followed. In the respondents' view, these reasons matter more than the more efficient use of abilities and skills or higher professional / personal opportunities. These results send a clear signal to policymakers: the brain drain phenomenon can be stopped when young people perceive a change in society and feel that the Romanian society as a whole is at the same standards as those abroad.

Since, as previously shown, the main reason for the migration decision is the opportunity to earn a higher income, our study investigates the extent to which an increase in potential income earned in Romania could change the decision to seek employment abroad. The results obtained are more than interesting and can provide a starting point in formulating economic policy on the labour market. It seems that, on average, a 75% increase in income compared to the current one will determine half of the students who are thinking of emigrating to give up this decision. We believe that this result is significant because it provides an important anchor for framing future labour market policies.

The primary analysis was based on a correlation analysis which follows the connection between the desire of Romanian students to migrate and the reasons that determine this desire. The results of the correlation analysis are summarized in Table 2.

Table 2. Correlations between intention to migrate and potential reasons for migration

	V1	V4.1	V4.2	V4.3	V4.4	V4.5	V4.6	V4.7	V4.8
V1	1								
V4.1	0.17	1.00							
V4.2	0.16	0.72	1.00						
V4.3	0.12	0.59	0.63	1.00					
V4.4	0.19	0.63	0.71	0.55	1.00				
V4.5	0.11	0.50	0.61	0.53	0.61	1.00			
V4.6	0.18	0.57	0.67	0.49	0.64	0.74	1.00		
V4.7	0.12	0.41	0.46	0.37	0.48	0.55	0.55	1.00	
V4.8	0.12	0.53	0.54	0.48	0.52	0.52	0.57	0.70	1.00

Source: Authors' own calculations

The results reveal moderate positive correlations between the intention to emigrate and the reasons that may determine this decision. This shows that each of the reasons analysed weighs in the decision, but none of them in a decisive way. These findings emphasize that the potential intention to emigrate is the result of a complex of motives that act concurrently and are not caused by a single reason. This impression is further supported by the strong correlations between potential

incentives, which shows that respondents tend to consider them together when making the decision to emigrate. If, however, we were to highlight in particular one of the reasons stated, this would be the one related to the quality of life: it seems that the desire to obtain a better quality of life is most strongly correlated with the intention to emigrate and seek a job abroad. This conclusion is in line with previous studies that identify higher quality of life as a main driver for migration.

Furthermore, our investigation focuses on the correlation analysis between the desire of Romanian students to migrate and the perceived advantages that may determine this desire. The results of the correlation analysis are summarized in Table 3.

Table 3. Correlations between intention to migrate and potential advantages

	V1	V5.1	V5.2	V5.3	V5.4	V5.5	V5.6	V5.7	V5.8
V1	1								
V5.1	0.29	1.00							
V5.2	0.35	0.49	1.00						
V5.3	0.39	0.43	0.62	1.00					
V5.4	0.37	0.44	0.50	0.70	1.00				
V5.5	0.24	0.38	0.41	0.43	0.44	1.00			
V5.6	0.22	0.34	0.37	0.38	0.36	0.73	1.00		
V5.7	0.21	0.38	0.38	0.43	0.44	0.58	0.60	1.00	
V5.8	0.37	0.31	0.45	0.54	0.52	0.62	0.64	0.69	1.00

Source: Authors' own calculations

In this case it can be easily seen that the correlations between the perceived benefits of migration and the intention to migrate are stronger than in the case of potential reasons. It is clear that the decision to emigrate is contingent to the projection that each respondent makes in relation to the benefits acquired as a result of this decision. It seems that all the potential benefits identified in the analysis are strong arguments in the decision to emigrate. If, however, we were to highlight in particular some of the potential advantages, these would be higher professional / personal opportunities. Moreover, a primary analysis of the correlations between the identified potential benefits shows that they can be clustered into two broad categories: professional benefits and social benefits. In any case, both categories of benefits seem to weigh significantly in the respondents' decision to look for a job abroad.

In the end, as expected, the correlation analysis further confirms the strong connection between revenue and skilled labour migration. Our data show a strong positive correlation (0.38) between the intention to migrate and the potential revenue level.

5. Conclusions

The results of the study are interesting since they contradict, to some extent, the widely spread perception according to which the majority of young Romanians wish

to emigrate. However, the opinion in favour of labour migration is slightly above average which is not necessarily an encouraging result. In this context, our findings emphasize that the Romanian economy is still facing the potential risk of brain drain, which could hinder the economic and social competitiveness. On the other hand, our study, besides confirming the link between the level of studies and better job opportunities, also reveals that students perceive the Romanian labour market as being highly qualified, which is a promising result.

Nonetheless, our analysis mainly focuses on identifying the main determinants that may influence young people's decision to seek employment abroad. In this context, two main categories of determinants were identified and analysed: potential reasons for migration and potential perceived benefits of migration. As expected, the main reason for the migration decision is the opportunity to earn a higher income. However, a better quality of life as well as better healthcare are identified as important arguments in the decision to emigrate. Moreover, our findings show that that the potential intention to emigrate is the result of complex and simultaneous motives and are not caused by a single one. In terms of potential benefits that may influence the migration decision of Romanian students, it seems that all the potential benefits identified in the analysis are strong arguments in the decision to emigrate. However, respondents are particularly interested in working in an environment where the social attitude is positive, people behave civilly and rules are followed.

However promising the results are, one could easily notice that the research focused on analysing data collected within the Bucharest University of Economic Studies, not taking into account students from other universities. A future study that extends the sample to ensure the inclusion of additional groups of respondents could provide a more in-depth understanding of this complex topic.

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References

[1] Alvarez-Plata, P., Brücker, H., Siliverstovs, B. (2003). *Potential migration from Central and Eastern Europe into the EU-15 – An update*, Berlin, DIW.

[2] Beine, M., Docquier, F., Rapoport, H. (2008). Brain drain and human capital formation in developing countries: winners and losers. *Economic Journal 118*, pp. 631-652.

[3] Berry, R. A., Soligo, R. (1969). Some welfare aspects of international migration. *J. Polit. Econ.* 77 (5), pp. 778-794.

[4] Bhagwati, J., Hamada, K. (1974). The brain drain, international integration of markets for professionals and unemployment: a theoretical analysis. *J. Dev. Econ.* 1 (1), pp. 19-42.

[5] Bhagwati, J., Rodriguez, C. (1975). *Welfare-Theoretical Analysis of the Brain Drain*. Working papers from Massachusetts Institute of Technology (MIT), Department of Economics, No 158.

[6] Bhagwati, J., Dellalfar, W. (1973). The brain drain and income taxation. *World Dev. 1* (1-2), pp. 94-101.

[7] Borjas, G. (1994). The economics of immigration. *Journal of Economic Literature 32*, pp. 1667-1717.

[8] Cervantes, M., Guellec, D. (2002). The Brain Drain: Old Myths, New Realities, *OECD Observer*, nr. 230.

[9] Cinar, D., Docquier, F. (2004). Brain drain and Remittances: implications for the source country, *Brussels Economic Review*, 47(1), pp. 103-118.

[10] Commander, S., Kangasniemi, M., Winters, L. A. (2003). The brain drain: Curse or boon? *IZA Discussion Papers 809*, Institute for the Study of Labor (IZA) June.

[11] Desai, M. A., Kapur, D., McHale, J., Rogers, K. (2009). The fiscal impact of high-skilled emigration: Flows of Indians to the US. *J. Dev. Econ*. 88 (1), pp. 32-44.

[12] Docquier, F., Iftikhar, Z. (2019). Brain drain, informality and inequality: A search-and-matching model for sub-Saharan Africa, *Journal of International Economics* 120 (2019) 109–125, https://doi.org/10.1016/j.jinteco.2019.05.003.

[13] Docquier, F., Marchiori, L., Shen, I-L. (2010). Brain drain in globalization: A general equilibrium analysis from the sending countries' perspective, *CEPR Discussion Papers* 7682, C.E.P.R. Discussion Papers February.

[14] Docquier, F., Rapoport, H. (2012). Globalization, brain drain and development. *J. Econ. Lit.* 50 (3), pp. 681-730.

[15] Dos Santos, M. D, Postel-Vinay, F. (2003). Migration as a source of growth: The perspective of a developing country, *Journal of Population Economics*, Springer, vol. 16(1), pp. 161-175.

[16] Fan, C. S., Stark, O. (2007). International migration and "educated unemployment". *Journal of Development Economics* 83, pp. 76-87.

[17] Gibson, J., McKenzie, D. (2010). The economic consequences of brain drain of the best and brightest: microeconomic evidence from five countries, *Policy Research Working Paper Series* 5394, The World Bank August.

[18] Grubel, H., Scott, A. (1966). The international flow of human capital. *Am. Econ. Rev*. 56 (1/2), pp. 268-274.

[19] Haque, N. U., Kim, S.-J. (1995). Human capital flight': impact of migration on income and growth. *Int. Monetary Fund Staff Papers* 42 (3), pp. 577-607.

[20] Hatton, T.J., Williamson, J.G. (2005). Global Migration and the World Economy: Two Centuries of Policy and Performance. *The MIT Press*, Cambridge, MA.

[21] Kugler, M., Rapoport, H. (2007). International labour and capital flows: complements or substitutes? *Economics Letters* 94, pp. 155-162.

[22] Li, X., McHale, J. (2006). Does Brain Drain Lead to Institutional Gain? A Cross Country Empirical Investigation. *Mimeo*, University of British Columbia, Vancouver, BC.

[23] Lodigiani, E. (2008). Diaspora externalities and technology diffusion. *Economie Internationale* 115, pp. 43-64.

[24] McCulloch, R., Yellen, J. L. (1977). Factor mobility, regional development, and the distribution of income. *J. Polit. Econ.* 85 (1), pp. 79-96.

[25] Mesnard, A., Ravallion, M. (2001). Is inequality bad for business: a non-linear microeconomic model of wealth effects on self-employment, *Research working paper*, WPS no. 2527.

[26] Miyagiwa, K. (1991). Scale economies in education and the brain drain problem. *Int. Econ. Rev.* 32 (3), pp. 743-759.

[27] Mountford, A. (1997). Can a brain drain be good for growth in the source economy? *J. Dev. Econ.* 53 (2), pp. 287-303.

[28] Pociovalișteanu, D. M., Badea, L. (2012). Some aspects concerning the Romanian labour market in the context of emigration, The Annals of the „Stefan cel Mare" University of Suceava. *Fascicle of the Faculty of Economics and Public Administration*, 12 (1), pp. 24-31.

[29] Psacharopoulos, G., Patrinos, H. A. (2004). Returns to investment in education: a further update. *Educ. Econ.* 12 (2), pp. 111-134.

[30] Regets, M. C. (2007). Research issues in the international migration of highly skilled workers: A perspective with data from the United States, *Working Paper*, SRS 07-203.

[31] Rodriguez, C. (1975). On the welfare aspects of international migration. *J. Polit. Econ*. 83 (5), pp. 1065-1072.

[32] Shrestha, S. A. (2011). Human capital investment responses to skilled migration prospects: Evidence from a natural experiment in Nepal, *Mimeo*, National University of Singapore November.

[33] Stark, O., Helmenstein, C., Prskawetz, A. (1998). Human capital depletion, human capital formation, and migration: a blessing or a 'curse. *Econ. Lett.* 60 (3), pp. 363-367.

[34] The World Bank. (2009). *EdStats: Public expenditure database*. http://ddp-ext. worldbank.org/ext/EdStats.

[35] Zhang, K. (2001). Human capital investment and flows: A multiperiod model for China. In: *6th International Metropolis Conference*, Rotterdam, The Netherlands November 26-30.

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The Effects of COVID-19 on Emerging Economies in Asia and Public Policies to Support the Economy

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Abstract

2020 has seen the world facing a new pandemic – the COVID-19 pandemic (caused by the coronavirus), originating in the Chinese province of Wuhan. With unprecedented contagion rates, COVID-19 has spread out rapidly and brought about the enforcement of measures meant to prevent the virus from spreading – social distancing or quarantine – that resulted in certain branches of industry coming to a halt and a domino effect in the economies of impacted countries.

The article focuses on analysing the way the emerging economies in Asia were impacted by the COVID-19 pandemic, the initial response of the countries in the region in general and ASEAN economies in particular, as well as public policies implemented in response to the pandemic. The starting point of research was set at the moment in time when the World Health Organization declared the COVID-19 epidemic a global pandemic; the article proceeds to examine the way countries in the region reacted, to identify the economic sectors that were hit the worst, the effects of the breakdown of supply chains and the way the estimates on the impact of the medical crisis on the economies in the region have changed over time.

As far as public policies implemented as a response to the pandemic are concerned, the text highlights the first steps taken by authorities in order to protect the population's health and to allow economic activity to continue, by analysing available data, in the context where the evolution of the medical crisis has been difficult to assess, and the predictions on the impact of the coronavirus on the economies in the area have been repeatedly revised as the crisis escalated, the predictions of international organizations included.

Keywords: COVID-19, emerging economies, Macroeconomic Policy, Asian Growth, Economic Development.

JEL classification: E02, F63, F62, F40, H12

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1. Introduction

Over time, mankind has had to face several pandemics, with the Spanish flu (caused by the H1N1 influenza virus) in the early 20th century (1918-1919) deemed to be the most severe pandemic in recent history. Estimates place the number of people infected with the Spanish flu at circa 500 million – that is, one third of the world's population at the time – and the number of deaths rose to more than 50 million. "The Asian flu" (H2N2), first reported in Singapore, in early 1957, caused 1.1 million deaths worldwide, and the A-H3N2 flu virus, first reported in the US in 1968, is still circulating nowadays, as a seasonal flu virus.

2020 has seen the world facing a new pandemic – the coronavirus (COVID-19) pandemic, originating in the Wuhan province in China. Initially thought to be a type of pneumonia or just a new form of flu, COVID-19 was then declared a global pandemic by the World Health Organization on March 11.

2. Problem Statement

The paper focuses on analysing the way the emerging economies in Asia were impacted by the COVID-19 pandemic, the initial response of the countries in the region in general and the ASEAN economies in particular, and the public policies implemented in response to the pandemic.

The starting point of research was set at the moment in time when the World Health Organization declared the COVID-19 epidemic a global pandemic; the paper examines the way the countries in the region reacted, the economic sectors that were hit the worst, the effects of the breakdown of supply chains and the way the estimates on the impact of the medical crisis on the economies in the region were revised.

3. Aims of the research

As far as the public policies enacted in response to the pandemic are concerned, the article identifies the first set of measures taken by authorities in order to protect the population's health and to ensure continued economic activity, by means of an analysis of available data, in the context where the evolution of the medical crisis has been difficult to estimate, and the predictions on the impact of the coronavirus on the economies in the region have been repeatedly revised as the crisis escalated, including the predictions formulated by international organizations.

4. Research Methods

A qualitative analysis of the response to the COVID-19 pandemic was used in order to highlight the reactions of national authorities and the way decisions were coordinated across the region.

Macroeconomic indicators have been taken into consideration; databases and official reports have been used as well, such as those reports issued by the Asian Development Bank (ADB), the International Monetary Fund (IMF), the World

Bank (WB), the Organization for Economic Cooperation and Development (OECD), the World Tourism and Travel Council (WTTC), the World Trade Organization (WTO) and data from national authorities – Finance Ministries and tourism supervisory authorities, among others.

5. Findings

With unprecedented contagion rates, COVID-19 propagated rapidly and brought about the enforcement of measures meant to prevent the virus from spreading – such as social distancing or quarantine – that led to certain branches of industry coming to a halt, with subsequent chain effects in the economies of the impacted countries.

In the first quarter of this year, the global equity market lost close to US$ 27 trillion in stock-market capitalization (the market value of the companies floated on stock markets) (Guda, 2020). Unlike previous financial crises, this time a "shutdown" effect occurred. The prevention measures meant to slow down the dissemination of the virus led to the partial or complete shutdown of certain ventures and to people resorting to sheltering in isolation, or, in other words, to a halt in economic activity, meaning the movement of the factors of production, including the workforce, internal and international specialization and uninterrupted production chains.

While a short time after the outbreak of the pandemic in China, the initial predictions estimated a short-term and limited impact on the global economy, the exponential propagation of the virus from one hotbed to other regions, including Europe, the US as well as the ASEAN countries, brought about a revision of growth forecasts.

Initially, the IMF predicted the impact of COVID-19 on the global economy would be a mere 0.1 percentage points, and it estimated economic growth in 2020 would amount to 3.2%; later on, on March 4 (IMF, 2020), the IMF revised its estimates to a level below the 2.9% economic growth rate of 2019, and on March 23 it announced a recession. In addition, the OECD, in its March 2 report assessing the impact of the COVID-19 outbreak (OECD, 2020), predicted a 0.5 percentage point drop from the initial prediction of 2.9% growth rate for the global economy in 2020, to 2.4%, or a drop to 1.5% in case of a prolonged global outbreak.

In a report published on March 6, the Asian Development Bank estimated the global impact of the pandemic at US$ 2 trillion to US$ 4 trillion; then, on May 15, the ADB released an assessment of the costs caused by COVID-19, ranging from US$ 5.8 trillion to US$ 8.8 trillion, which is the equivalent of 6.4% to 9.7% of the global GDP (ADB, 2020).

In ASEAN countries (ASEAN - the Association of Southeast Asian Nations: Brunei Darussalam, Cambodia, the Philippines, Indonesia, Laos, Malaysia, Myanmar, Singapore, Thailand and Vietnam), the pandemic has brought about an immediate disruption in economic activity across the entire region, an immediately apparent decline of tourism, a halt in air travel and a drop in consumer and corporate confidence, as several countries enforced travel restrictions, shelter in

place or quarantine, in the case of people coming in from countries impacted by COVID-19, so as to keep the virus from spreading.

China is ASEAN's biggest trade partner and investor. In 2018, China accounted for 17.1% of ASEAN's total trade and for 6.5% of ASEAN's total direct investments. ASEAN's supply chains are heavily integrated with China's production sector, and the region's tourism sector benefits from the heavy inflow of Chinese tourists. In addition to China, the other countries impacted by contagion to a significant extent, the US and the Eurozone, are, in turn, some of the ASEAN's biggest trade and investment partners, and ASEAN member countries themselves are directly impacted by the outbreak. The World Trade Organization estimated a drop of global trade of 13% to 32% in 2020, higher than the decline brought about by the global financial crisis (WTO, 2020).

At the time of the COVID-19 outbreak in Wuhan, the main concern of the countries in South-East Asia was the possible impact on supply chains, as a result of the temporary shutdown of the factories in the Hubei province, because of the blockages. Hubei is an important industrial hub, particularly for machine and electronics manufacturing. When production came to a halt, it created deficiencies in the delivery of components, which brought about a decline in operations throughout the supply chains, including those located abroad. This impacted entities that were integrated into supply chains, including the ASEAN member countries.

As the virus was rapidly spreading in China, most countries in South-East Asia placed restrictions on travel to and from China, a restriction that was later on expanded to include other impacted countries, such as Japan and Korea, by cancelling flights and even closing down borders. In other words, there was an immediate and direct impact on travel and tourism. Japan and Korea were some of the biggest sources of tourists for ASEAN, and, as the scope of the travel restrictions expanded, it led to mass cancellation of hotel bookings in the tourism industry, impacting companies and employees. Then the first cases in the ASEAN member countries were reported, which further impacted tourism in the region, as fear of contagion drove tourists away. Therefore, the initial incentives implemented by countries in South-East Asia concerned tourism and the related sectors. Impacted hotel operators, restaurants and airlines, as well as small enterprises, were offered tax cuts and/or emergency loans, and employees were supported with various subsidies or even money.

Other additional measures to alleviate the impact of COVID-19 were implemented as well, to varying degrees – authorities decreed the enforcement of social distancing, the temporary closing down of schools, offices and non-essential enterprises, lockdown and quarantine. The economic impact escalated afterwards, as discontinued production, discontinued commercial operations and the large-scale travel restrictions led to losses for companies and the loss of means of living and income for the employees.

At the beginning of the COVID-19 epidemic, many countries did not anticipate the economic impact and underestimated the costs caused by the virus. The IMF

initially declared that the impact would be limited, probably around 0.1% of their 3.3% growth estimate for the global economy for 2020. More than a month after the initial statement, the IMF announced a serious revision for the worse of its growth forecasts for 2020. The Asian Development Bank, by way of its growth predictions in the Asian Development Outlook report in April, indicated the extent of the impact of COVID-19, in terms of the difference between the new estimates the predictions made last year, before the outbreak. The ADB revised its forecast for developing countries in Asia for the worse by 3.0 percentage points to 2.2%, and the forecast for ASEAN countries by 3.7 percentage points to 1.0%. The Asian Development Bank encompasses Developing Asia member countries: Afghanistan; Armenia; Azerbaijan; Bangladesh; Bhutan; Brunei Darussalam; Cambodia; the Cook islands; the Federated States of Micronesia; Georgia; India; Indonesia; Fiji; Hong Kong, China; Kazakhstan; Kiribati; the Kyrgyz Republic; the People's Democratic Republic of Laos; Malaysia; the Maldives; the Marshall islands; Mongolia; Myanmar; Nauru; Nepal; Niue; Pakistan; Palau; Papua New Guinee; the People's Republic of China, the Philippines; the Republic of Korea; Samoa; Singapore; the Solomon islands; Sri Lanka; Taipei, China; Tajikistan; Thailand; East Timor; Tonga; Turkmenistan; Tuvalu; Uzbekistan; Vanuatu; Viet Nam.

Table 1. Estimated global and regional impact of the COVID-19 outbreak, under different scenarios

	Shorter containment, smaller demand shocks		**Longer containment, larger demand shocks**	
	% of GDP	**Losses $ billion**	**% of GDP**	**Losses $ billion**
World	-2,3	2,013	-4,8	4090,8
People's Republic of China	-4,6	628	-5,1	691,6
Developing Asia excluding the PRC	-1	93,3	-2,2	200,1
Rest of the world	-2	1291,6	-5,1	3199,1

Source: ADB estimates

The economic growth predictions for the ASEAN member countries have been revised for the worse (Table 2). For instance, before the outbreak of the epidemic, Indonesia expected a 5.3% increase in 2020; by April, the estimate was revised downwards to 0.4% - 2.3%. In a similar manner, the official target for growth in the Philippines in 2020 had been set at 6.5% - 7.5%. The impact of COVID-19 was initially limited, and the target was left unchanged. Nevertheless, by March 19, the economic growth forecast was lowered to -0.6% - 4.3%, taking into consideration the impact on the transport sector and tourism, exports, remittances from workers abroad, consumer spending and the effects of the lockdown (NEDA, 2020). In early February, Thailand and Singapore had revised their predictions to take into account the evolution of tourism - Thailand, down from 2.7%-3.7%, to 1.5%-2.5%, and Singapore down from 0.5%-2/5%, to between -0.5% and -1.5 %. On March 26, Singapore announced its worst-case scenario, predicting a 4.0% drop of the GDP.

Table 2. GDP growth forecasts for 2020 ASEAN

Country	Initial Forecast		Revised Forecast	
Brunei Darussalam	1.5%	Sep 2019	2.0%	3 Apr 2020
Cambodia	6.8%	Sep 2019	2.3%	3 Apr 2020
Indonesia	5.3%	Official target, Aug 2019	4.7% to 5.0% -0.4% to 2.3%	4 Mar 2020 1 Apr 2020
Lao PDR	6.2%	Sep 2019	3.5%	3 Apr 2020
Malaysia	4.8%	Official target	3.2% to 4.2% -2.0% to 0.5%	Feb 2020 3 Apr 2020
Myanmar	6.8%	Sep 2019	4.2%	3 Apr 2020
Philippines	6.5% to 7.5%	Official target	5.5% to 6.5% (if outbreak lasts until June) -0.6% to 4.3%	Mar 2020 19 Mar 2020
Singapore	0.5% to 2.5%	Nov 2019	-0.5% to 1.5% -4% to -1%	17 Feb 2020 26 Mar 2020
Thailand	2.7% to 3.7%	Nov 2019	1.5% to 2.5%	17 Feb 2020
Viet Nam	6.8%		6.27% if contained in Q1; 6.09% if contained in Q2 5.96%	5 Feb 2020 13 Feb 2020

Source: NEDA

The breakdowns in supply chains, the travel restrictions and the blockages have had ample consequences. Many companies downsized or even shut down operations for a while, and financial markets in the US, Europe and Asia were impacted by the coronavirus.

The effect of the COVID-19 pandemic on the financial system will depend, on the one hand, on how much the virus would spread across the world, and its effect on economic activity, and, on the other hand, on the response to the shock, in terms of fiscal and monetary policies and regulatory measures meant to prevent the weakening of the banking system.

In the US, the Dow Jones Industrial Average lost 2,999 points (12.9%), closing at 20,188.52, with March 16 seeing the second most serious drop in a single day, in percentage points, after the "Black Monday" in 1987. In addition, the stock markets in Europe, Asia and Latin America registered steep drops (CNBC, 2020).

The macroeconomic indicators reveal that the ASEAN member countries currently register public debt and budget deficit levels that limit the steps meant to support economies (Table 3).

Table 3. ASEAN macroeconomic indicators, 2018

Indicator	Inflation	Broad money	Current account balance	Fiscal balance	External debt stocks	External debt stocks, short term	Reserves
Unit	%	% of GDP	% of GDP	% of GDP	% of GDP	% of total external debt	% of external debt
Brunei Darussalam	0.2	81.6	7.9	-3.6	(na)	(na)	(na)
Cambodia	2.5	100.7	-11.3	-0.8	62.3	15.4	90.5
Indonesia	3.2	38.8	-3.0	-1.8	35.5	14.3	32.6
Lao PDR	2.0	52.3	-12.0	-4.4	86.1	2.6	6.3

Indicator	Inflation	Broad money	Current account balance	Fiscal balance	External debt stocks	External debt stocks, short term	Reserves
Malaysia	0.9	125.2	2.1	-3.6	62.4	43.3	45.4
Myanmar	6.9	52.6	-4.2	-2.6	19.3	5.9	37.8
Philippines	5.3	78.1	-2.6	-1.6	23.0	20.4	100.5
Singapore	0.4	122.7	17.9	3.6	411.8	74.8	19.5
Thailand	1.1	123.2	6.4	-0.2	33.5	35.6	121.5
Vietnam	3.5	158.1	2.4	-4.4	44.8	18.1	51.3

Source: adapted from ASEAN Policy Brief (2020)

As far as the financial sector is concerned, ASEAN member countries have taken several measures in order to boost lending – operations on the open market, cutting down banks' minimal mandatory reserves, credit facilities and refinancing policies. In addition, financial institutions have lowered loan interest rates and offered additional credit to companies in the industries impacted by the COVID-19 pandemic, as well as to the producers of critical medical supplies and equipment. At the same time, banks implemented various schemes to allow the postponement of loan repayments for both SME and retail customers.

6. Conclusions

The COVID-19 pandemic has directed attention to the interconnection of various countries brought about by globalization and to the accompanying risks and vulnerabilities. The breakdown of supply chain in a certain region impacts other regions as well and may even lead to the redirection of trade and investments to other regions, in an attempt to cut back the risk of a halt of production as a result of the respective breakdowns. In addition, the world's biggest economies – the US, China, the EU – are the main economies to rely on demand and supply shocks and they are the ASEAN's main trade partners, as well, accounting for half (50.3%) of the ASEAN's total trade in goods (US - 9.31%, China - 17.12%, the EU - 10.20%). In turn, the other trade partners of the region, such as Japan (8.20%), Korea (5,72%) and Hong Kong (4,19%), were impacted as well.

The disruptions in trade influence the economy of the region, but the impact depends on the structure of the national economies. One source of resilience for the ASEAN countries might be a diversified commercial structure, where trade is diversified to include a wide range of products, rather than concentrated on a few sectors, which would lessen the impact.

In addition to trade, the most severely impacted industry was tourism. According to the World Travel and Tourism Council, the travel and tourism industry accounted for 330 million jobs worldwide, by 2019, and it contributed 10.3% of the global GDP (US$ 8.9 trillion). The organization estimates the impact of COVID-19 on the industry would be five times more severe than the impact of the 2008 financial crisis and that it would cause a 2.9 percentage points rise in global unemployment rates (100.8 million jobs lost because of the coronavirus) (WTTC, 2020).

Travel restrictions have been enforced on a large scale, including in South-East Asia, and they deeply impacted the tourism industry. Travel and tourism had accounted for 12.6% of the ASEAN economy in 2018. Among the ASEAN countries, Cambodia, the Philippines and Thailand are the most vulnerable – they are the countries where tourism has the biggest contribution to GDP revenue (Cambodia - 32.8%, the Philippines - 24.7%, Thailand - 21.6, Lao – 12%, Malaysia – 13,3%, Singapore -10%. Source: World Travel and Tourism Council).

As far as public policies implemented in response to the pandemic are concerned, governments and central banks across the world have prepared packages of monetary and fiscal measures in order to support the healthcare sector and economic activity and to support companies and individuals during periods of isolation or travel restrictions. In the region, the ASEAN countries introduced various packages of economic incentives in February, in order to alleviate the effects of the COVID-19 pandemic. The common measures consist in fiscal incentives for impacted companies, particularly for SMEs and companies in the sectors most seriously hit – subsidies, cash funds, discounted electricity bills and others, for households and employees, including additional incentives for people in the healthcare sector, postponement of tax payment, postponement of loan payments, tax exemptions or tax cuts.

Some of the ASEAN countries introduced distinct measures targeting key sectors of the economy. For instance, Brunei allowed the postponement of contributions to pension funds, while Malaysia allowed the payment of diminished pension contributions. Singapore suspended the payment of student loans and students' tuition fees. At the same time, in Vietnam, several banks (including the country's four biggest banks -Vietcombank, Vietinbank, BIDV and Agribank) have created a lending package, with special terms and low interest rates, worth a total VND 285 billion (US$ 12.3 billion) for companies in need of support.

References

[1] ADB (2020). The economic impact of the COVID-19 outbreak on Developing Asia, *ADB Brief* no. 128.

[2] ADB (2020). An Updated Assessment of the Economic Impact of COVID-19, *ADB Brief* no. 133.

[3] Association of Southeast Asian Nations (2020). *ASEAN Policy Brief*, April 2020.

[4] Guda, I. (2020). *Economia în vremea coronavirusului: ghid de bune practici pentru antreprenori și politici publice*, București, Publica.

[5] Imbert, F. (2020). Dow drops nearly 3,000 points, as coronavirus collapse continues; worst day since '87, *CNBC*, https://www.cnbc.com/2020/03/15/traders-await-futures-open-after-fed-cuts-rates-launches-easing-program.html.

[6] IMF (2020). IMF makes available USD50 billion to help address coronavirus, https://www.imf.org/en/News/Articles/2020/03/04/sp030420-imf-makes-available-50-billion-to-help-address-coronavirus.

[7] NEDA (19 March 2020). Addressing the Social and Economic Impact of the COVID-19 Pandemic, http://www.neda.gov.ph/wp-content/uploads/2020/03/NEDA_Addressing-the-Social-and-Economic-Impact-of-the-COVID-19-Pandemic.pdf.

[8] OECD (2 March 2020), Coronavirus: The world economy at risk, OECD Interim Economic Assessment, https://www.oecd.org/economic-outlook/.

[9] World Travel and Tourism Council (2020). Travel & tourism economic impact from COVID-19, https://wttc.org/Research/Economic-Impact.

[10] WTO (8 April 2020), Trade set to plunge as COVID-19 pandemic upends global economy, https://www.wto.org/english/news_e/pres20_e/pr855_e.htm.

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The Contagion of Economic Crises in The Vision of the Constructal Theory

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Abstract

Through the article we try to understand certain aspects of economic reality through the eyes of the Constructal Theory. I will try to present the essential characteristics of economics revealed by C.T. and the implications of the theory in crises and economic cycles and especially in the area of crisis contagion. The mentioned theory is built in the theoretical framework of thermodynamics, but has many applications in the area of social sciences and economics. The author has written several articles on the implications of this theory in economics and this time he focuses on the contagion of crises. Due to the difficult times that the economy is going through and especially due to the explanatory and predictive failure of the empirical theories I think it is time to go back to the theory of a pencil and a piece of paper. That is, to abstract theory, a theory in the Aristotelian sense, that is, led and created by a mind that has managed to squeeze the essences of the world; a mind capable of seeing the causal links between phenomena without a prior empirical study. One such theory is C.T., a theory born directly from the mind of a teacher: Adrian Bejan. Surprisingly, this theory proved to be perfectly applicable in the field of empirical sciences. The contagion of crises has been approached by numerous theories and the time has come for C.T. to try its explanatory powers.

Keywords: Constructal Theory, flow systems, crisis contagion, causes of crises, effects of crises.

JEL Classification: A120, B300, B520

1. Introduction

C.T. appeared from an intuition of its author (Bejan, 2016), who then built it with a pencil, a ruler and a compass. C.T. it has a very high general applicability including in the study of social sciences and especially in economics. C.T. is a theory generated in the field of thought of thermodynamics and engineering. Its application in the field of economics is at the beginning of the road and I consider

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that this paper is the first of its kind (referring to contagion) in Romania and among the first internationally.

There are two ways to build a theory:

The first method: we start from some empirical data permanently observed and we find a certain pattern of repetition of these data and then we look for deeper causes.

The second method is built (through inspiration and intuition) a theory through a mechanism that tends to a priori. Through abstract, logical thinking, concepts are built and the connection between these concepts is made. The first stage in this case is to raise the logical foundations and theoretical working hypotheses. Then of course follows the confrontation with the facts. Usually in one generation the foundations are laid, and the next generation struggles with the facts and follows any adaptations and modifications of the theory. C. T. has the advantage that both stages of the theory take place in the same generation (Bejan & Zane, 2012).

C. T. sees the essence of existence in flow. Everything is a flow of both the inanimate and the animated world. The aim is towards an easier flow, a more efficient transport in large quantities. The flow must have an engine, a power source and at the same time a braking system consisting of the flow medium. One cannot do without the other. Flow resistances determine the shape of the system, more precisely the architecture of the system (Bejan, 2016).

To understand C. T. we must have in mind a river basin. There are two types of flow: diffuse and laminar. The first is undetected, invisible, unorganized; the second is in organized channels. The speed and flow time of the two types is equal. The organized flow is according to certain mathematical ratios within the types of channels. Thus appear hierarchy, architecture, complexity and inequality. The channels are from many small to few large (Bejan & Zane, 2012).

The architecture evolves so that the system covers the entire surface, the flow is as smooth and efficient as possible. A point should move as easily as possible over the entire surface to a drain point (Bejan, 2016).

The evolution of the systems is S-shaped and a new cycle overlaps with the old one without replacing it. There are no bumps on a wall, no catastrophes (Bejan & Errera, 2017).

Resistances in the system are very important. They shape the system. The system tries to distribute them evenly. There are transverse and longitudinal resistances. Systems strongly transform the environment they are in, and systems need a resilient environment to form (Bejan & Zane, 2012).

2. Problem Statement

Freedom is essential (Bejan, Errera & Gunes, 2020). The freedom of the economic system is measured by the number of characteristics that can change independently of other characteristics and freely without outside intervention but only as a result of the mechanisms of their own DNA.

The number of ways in which a system can evolve gives the degree of freedom of the system (Bejan, Errera & Gunes, 2020). For the economy we can think in a

negative way to find out the degree of freedom. That is, where are the limits of a man's action, where are the barriers. In economic terms of liberalism: the limit is the property of the individual (node) next to you; in terms of socialism the limit is bureaucratic legislation, legislation whose purpose depends, not on principles, but on certain group or individual interests.

Blocking the freedoms and forcing the system in a certain direction is only the preamble to the forced shaking movement of the system so as to get rid of artificial barriers. The system wants to follow the natural path to greater freedom and coverage of economic areas. *Shaking is a crisis* (Bejan, 2020).

On its own, an individual must consume much more energy to survive than in the alternative, where he is included in a system (Bejan, Gunes, Errera & Sahalin, 2018). The larger, more complex the system is (i.e. it has a multi-level architecture), the more energy savings occur (energy consumed per unit of good transported). At the same time, the total energy consumed increases. The result: individuals in a complex system live easier; they have more facilities available and more consumer goods accessible for use; they have more free time and the effort made for the necessary ones is diminished. All this is compared to individuals living in simple systems.

Inequality in a system is inherent (Bejan, 2020). It appears with hierarchy and architecture. Inequality increases with the complexity of the system and its evolution is towards a hierarchical configuration. Systems are evolving towards a more complex hierarchy at a certain pace. Complex represents a hierarchy that grows in hierarchical levels. A system grows in the hierarchy to cover an area as well as possible, to ensure a constant, stable, high flow and increasing flow. In social systems, inequality leads to social movements, riots, revolutions, etc. The role of the state and social organization is to reduce inequality (reducing the convexity of the inequality curve) by building canals and bringing flow to dry areas.

Inequality is an unpleasant result of complexity in terms of social ethics. Inequality is a sharp differentiation between the rich at the top and the poor at the bottom. The distribution is from many small to few large.

We think of a graph in which we pass wealth on the abscissa axis, and the number of people on the ordinate axis. The greater the complexity of a system and the freer it is: the distance on the abscissa axis between the ends of the graph lengthens and moves away from the origin (because the wealth of society as a whole increases and increases and the wealth of those considered poor); and the difference between the ends of the graph on the ordinate axis (regarding the number of those with a certain income) also increases.

Thus, the complexity of a system leads to a steep slope of the graph. The purpose of organizing the company is to: lengthen the graph on the abscissa axis; to remove it from the origin and to reduce as much as possible the height on the ordinate axis. That is: the slope of the graph curve must be as small as possible and the graph as far away from the origin as possible on both ordinates. *From the triangle we should make a trapezoid on the graph and in real life.*

Abnormal distributions in society due to aberrant interventions lead to: high-slope graphs; with long length on the ordinate axis and close to the origin on both axes. In primitive societies the curve can be divided into two. Many with little power (wealth) and very few with excessive power (wealth).

If we think of the graph: Lorenz curve of income distribution in the population; then the experiences undertaken by Adrian Bejan lead to the following conclusion (Bejan, 2020): with the increase of the complexity of the system, the convexity of the wealth distribution curve is accentuated and moves far away from the first bisector. Although the wealth of the system as a whole increases (the wealth of the poor increases), the inequality of the system is accentuated by its hierarchical complexity. I repeat, inequality is rising to a new level of wealth. The role of the state in reducing inequality and raising the wealth distribution curve and bringing it closer to the first bisector must now come into play. This will be done by decreasing the overall wealth of the system.

Reducing poverty in a modern economy means: creating artificial canals in dry areas (Bejan, Errera & Gunes, 2020). These channels must be made from saved power (savings) and taxation, etc. It is not enough to create a channel in a non-existent area, but a flow must be brought into this area; it must be connected to the main flow system; the necessary pumps must be made to carry the flow to the poor areas. That is, it is not enough to give alms in poor areas for troubled people, but you must: bring education, the health system; organize systems for the exploitation of resources in the area (enterprises); bring the system of roads and railways to poor areas.

Unfortunately, in history, we know that all attempts to rationalize poverty have failed. The benefits were marginal and minor, and often ended in violence. Why ? Because the social system itself as a flow system changes its configuration if it is left free to eliminate poverty. In order to eradicate poverty, more resources must be consumed instead, and innovation must be promoted in order to consume less energy per unit of mass transported.

However, programs to reduce inequality must not be removed. Inequality is one of the major issues leading to social movements and crises (Bejan, 2020). From the Jubilees mentioned on Hammurabi's star to today's social programs, attempts are being made to reduce the feeling of frustration and helplessness that the vast majority experience in the face of economic mechanisms. Achieving inequality must be achieved at the cost of reducing overall wealth.

The increased complexity of a system represents: higher and faster flow (Bejan, 2016). A system reaches its maximum complexity at a certain point and the law of decreasing yields appears.

The hierarchy of a system is inherent in the freedom of the system (Bejan, 2020). It comes in a package. Hierarchy can only appear after the system has reached a certain critical mass (surface, volume, flow, transported material). The hierarchy is necessary so that the system can adapt to various surfaces, events, the external environment and to gradually expand to cover as large an area as possible.

The social hierarchy gives the individual the opportunity: to work according to his interests, to collaborate, to associate and to pursue his own goal, to move on the entire economic surface and to have access to as much wealth as possible.

For example, in the case of urban areas, it is directly proportional to the area it serves. Large cities appear due to the different services that can only appear in large urban concentrations and that serve large areas.

A mature social organization is subject only to marginal changes regarding only the periphery (Bejan, Errera & Gunes, 2020).

Socialism (Bejan, 2020). The egalitarian communities desired by Marxism mean only the lack of hierarchy and architecture and widespread poverty. The system can only adapt to the environment to a very small degree, it cannot evolve and spread. Ecology has an identical approach. To evolve, a system changes nature profoundly, consumes resources, uses the environment and changes it according to its own requirements. Not changing the environment means returning to the stage of gathering and generalized poverty. The impact of a system in nature increases progressively with the hierarchy and development of architecture.

Communism: he wanted to create a fishing net-like social network. Each node (individual) to receive and evacuate an equal amount of flow. From each node to leave and come the same number of channels, and the channels to have the same length. Each node should be an input and an output. For a node to be an input and an output, resources must be evenly distributed. This only happens in the hunter-gatherer stage, when there is no exploitation.

If we overlap a perfectly symmetrical social network (like a fishing net) over unevenly distributed resources (as in the real world, i.e. flow inputs are in certain positions and flow outputs in other locations) then automatically: certain nodes receive more flow ; through some channels more flow passes, and through other channels it does not pass at all. It turns out that a hierarchical architecture is formed. In order to maintain an initial social structure (communism), resources must be taken that could have been used to develop the system and used to maintain (by force) the original form. Because the system evolves inherently, communism was an ankylosed social structure.

The end of communism meant superimposing an approximately symmetrical network over an area with unequally distributed resources. Those closest to the flow (resources) became rich, the rest became impoverished and thus the oligarchy appeared.

The key to evolution is innovation (Bejan, 2020). Innovation: attracts flow in areas where it did not exist before; opens new channels; increases the flow in existing channels; decreases flow resistance and more importantly finds new sources of flow. On these new sources of flow, innovation observes them in unexpected places or even creates new sources of flow, which they release into the environment.

People today are migrating to greater personal freedom where they can better fulfil themselves personally (Bejan, 2020). Freedom is what determines the contemporary flow of the population. An area with more wealth offers more

freedom, more solutions, opportunity, more decision-making options and more possible ways to follow.

3. Research Questions/Aims of the research

One of the most important aspects of crises is the contagion, i.e. the way in which failures are transmitted throughout the system. We will try to understand this phenomenon with the help of C.T., which we tried to present.

What is a crisis? A blockage in the flow system. The material that was the object of the flow does not move, it remains stuck in the pipes. Why?

If it is a real crisis (related to the field of physics itself) it means that there is no demand for certain objects in which many resources have been invested (Keynes, 2007). An example is the global car industry where more is produced than required. Much has been invested in this industry, an industry that has also benefited from generous subsidies due to strong unions. All with hope for a future increase in demand. This demand has stopped growing, and now the resources are blocked and they will need to be relocated. The process will take time and will be accompanied by many problems. It is hoped, in the desire to cover disaster, the emergence of new innovations that will stimulate demand. Example: the electric car.

Another attempt to explain the crisis is: the insufficiency of the development of the system itself to cover the entire area. Hundreds of thousands of people die of hunger or water insufficiency every year. For an individual dying of deprivation, it is of little importance whether global indicators are rising or falling. He is experiencing a permanent crisis.

Defining crises is itself a relative issue. We can talk about a local, regional or global crisis. For the inhabitants of an isolated village left without water facing the problem of extinction, it is too unimportant whether an average person in Germany will be forced to postpone for a year or two the purchase of a new car with the latest improvements because it is just an economic crisis.

References to cycles and crises are linked to a part of global society. The most technologically advanced. It is constantly expanding, expanding the periphery and including new areas, and the areas left outside it are gradually diminishing.

In addition to the current global system, there are isolated local systems. They are little influenced by the global major system and in turn have an almost non-existent influence on the global major system. They will certainly be included in it in the future.

When we talk about current cycles and crises, we are certainly referring to the main global system in which most states are included (and of course those with a major flow of flows). For the global system to suffer, a critical mass of problems is needed; or the system subordinated to the global one, which is affected, must be large enough for the accumulated problems to spread. The critical mass of the accumulated problems or the critical mass of the affected subordinate system (subsystem that will problematize the flow in the entire flow system) cannot be

established exactly quantitatively prior to the occurrence of economic crises. Theoretically we can give a qualitative description of the trend.

It does not matter where the blockage occurs. Most likely most blockages occur in the money flow system. Money as symbols of the condensation of the power of movement is the easiest to corrupt and manipulate. It is connected to the real flow system. What happens in one system is related to what happens in the other. I remain a follower of the Austrian School, so I consider that the critical mass of problems appears with maximum probability in the money flow system (Mises, 1966). What happens next?

From the point of view of C.T. we distinguish two types of problems:

First. There are artificially overstated economic areas by inoculating resources far beyond the natural need. The reason: games of interest. The canals in the artificially supervascularized and artificially pressurized area are destroyed, the pressure is too high for the system category in the area and then the flooding, with the surplus of artificial flow created, of the areas kept artificially, dry or lower vascularized (and which normally with a free system would have been vascularized). Where is the problem? It takes time for canals to form in the dry and flooded area. As an example we can stick to what I wrote about the automotive industry and lending (by banks) without prior savings of various industries.

Second. In systems where unexpected flow resistances occur, the natural tendency of the system is to distribute the resistances evenly throughout the system so as to facilitate easy flow throughout the system. Crises are in this case a blockage, a brake on the flow and automatically the system will try to distribute the resistances evenly throughout the system. This is, we believe, the mechanism by which contagions occur.

The elements that limit crises in our vision are:

First. Restrictions on the membranes that delimit the state systems between them. Represents the legislation that regulates the inflows and outflows of a country.

Second. Bureaucratic regulations that had previously created unnecessary and artificial resistance in the system made it difficult to run, but which now prevent the crisis from spreading.

The two restrictions, mentioned above, lead to flow resistances (even in the case of a non-crisis economic situation), but they do not reach the critical mass so as to affect the entire flow system. But they only affect the local, state level.

From the point where the crisis occurs, it is distributed radially in the system (King, 2017). The intensity rate decreases progressively. The major problem is modern technology that has made the centre of a crisis everywhere or at least in the major centres of vascularity.

The differently distributed resources on the surface of the globe have led to the emergence of different specialized flow systems. Concentrated vascularizations occurred in certain areas that expanded and then coupled to other flow systems. So that a commodity / good is distributed as much as possible. The emergence of states and related bureaucracies has led to: the emergence of selectively permeable

membranes between states and the state bureaucracy that has imposed flow resistance artificially depending on more or less artificial criteria.

States have evolved towards increased economic separation and simultaneously towards economic integration. The secret of well-being consists of two simultaneous movements: specialization (depending on resources) and integration. The deeper the differentiation and the deeper the connection of the parts, the greater the wealth is (SedLacek, 2013).

A deep and broad global connection ultimately means permeabilizing membranes between states until dissolution so that goods / ideas flow freely. Any removal of barriers between states (tariff or otherwise) will streamline the circuit as a whole without taking into account the benefits of one area or another. For the global system one region is no more important than another and a node - an individual is no more important than another. So when a part of the system faces a problem (blockage, leakage or excessive flow) the system will try to distribute the resistors everywhere or eliminate the excess flow.

The way the banking system works leads to an acceleration of the cash flow far beyond the possibilities of the flow of real goods or over the rate of innovations, which improve the real flow (Soto, 2006). The result is that the flow system tries to get rid of this artificial surplus.

The question remains. When a Ponzi scheme breaks down, where does the money go? Because no one in the history of breaking these bubbles has tracked down the money and everyone has gone bankrupt. The answer in the light of C.T. is that the flow in the channels turns into a diffuse flow (i.e. unorganized into channels), exactly as in the initial stage and can no longer be identified; it spreads uniformly amorphously in the banking-financial area.

4. Research Methods

The methodology used in this article and especially in C.T. it is an Aristotelian type a priori. The human mind is constantly facing a lot of chaotic data. Certain mechanisms innate in the human mind are constantly trying to detect a configuration of the appearance of this data. The mind is constantly looking for a connection between data, a pattern. Is causality in the human mind or does it really exist in reality? This question remains open. What does the empirical data link: a simple whim of the mind or is there really an objective connection?

Adrian Bejan has a brilliant intuition. Adrian Bejan had the intuition that existence is a flow. But the flow is according to some mathematical rules and principles. It all starts as a flow that unfolds to infinity. He lays down his intuition on paper using only simple mathematics. Everything is connected with an absolute mathematical necessity. But then surprisingly the applied mathematics used by him is also used by nature. Wherever C.T. has been applied, it explains things impossible to explain before, it has great predictive power.

In this article I have taken over the conceptual apparatus of C.T. and applied it to the contagion of economic crises. I only used the narrative argument. This type

of argument is mainly used in the social sciences and especially in the historical sciences. The logic of the article is narrative.

5. Findings

The organized system of financial institutions and modern technology have led to the translation of problems from their centre of occurrence and intact movement to other vascular centres, without the phenomenon of gradual decrease with a certain rate of toxic flow. Any flow is diluted in time and space as a result of the inevitable law of entropy increase. By taking a toxic stream from one region and moving it identically to another, it is possible to multiply the toxic stream without the possibility of decreasing its strength. It is the story of the crisis of 2008. A toxic asset has been multiplied and distributed throughout the system while maintaining its original strength.

A state system has the choice to sweep within a range of two limits. 1. The first of the limits is total isolation. The risk is total rigidity. Isolation leads to the use of resources only from within borders. The result depends on the area, population; but regardless of their size, they will reach blockage, ankylosis. Regardless of the rate of innovation, they can only have a local effect and can only refer to local resources. No matter how favourable, an innovation that cannot connect to local resources is dead. 2. The second limit is full opening. The risk is that too frequent changes can lead to chaos, instability, too fast for minimal adaptation to occur by the local population. The population itself can change too often, genetically or mentally for a minimal dynamic balance to appear between the population and the environment, a balance necessary for a minimum well-being.

Changes that are too fast have a detrimental effect identical to the situation without changes. The population of a region, a state, must be inserted somewhere in a place in the wide range between the two extreme limits: rigidity and chaos.

In all areas dealing with living beings, it is found that the survival of a system and its evolution for the better depend on two things: 1. the specialization of its component parts as deep as possible and 2. their connection (their integration) as wide as possible. Globally, this means the specialization of areas / states as well as possible according to their resources / abilities as deeply as possible, but at the same time their integration, their connection (Reinhart & Rogoff, 2009). The reverse of the medal is represented by the economic cycles, the contagion. The widest possible integration of local systems leads to the creation of a global system without barriers. There will be no barriers to the good or the toxic, because the system is trying to distribute both evenly. The system wants to cover the entire surface as well as possible without taking into account the benefits of one area or another.

The alternative is to think of protection measures to reduce the negative impact of innovations. Example: Gradual reception of innovations and their effects in a given state. Testing innovations, leaving room for manoeuvre in case negative effects occur. It is possible to allow time for the positive and negative effects of an innovation to subside. Observing the negative effects of a new discovery

and finding the remedy to mitigate, diminish or cancel these effects. All this with the thought of avoiding the appearance of rigidity in the system due to a paralyzing caution.

Specialization and integration are the two keys to evolution in living systems, they also have a negative downside. Any obstacle in the operation of a certain specialized area on a certain product / commodity will stop the distribution and flow of that object. If an area specializes in a certain commodity, which is used as an intermediate product for some industries and there are problems (for various reasons) in the production of that good, then there will be a shut down for dependent industries. The problem with today's economies and industries is that everyone depends on everyone, there is almost no longer a production chain independent of other production chains (Schumpeter, 1976). An interrupted area closes all areas. It takes time for the system as a whole to change and gain other flow channels in addition to the blocked ones.

This is the story of the communist industry from the time of Nicolae Ceaușescu. The communist president tried to build an economy independent of external flow, self-sustaining. This meant building industrial branches and factories to cover all known economic areas. These factories were integrated into a self-sufficient flow system. The problems appeared related to raw materials, i.e. to the inputs of the self-sufficient industrial system. They were largely missing from Romania and had to be purchased at high prices from abroad. A single factory at the base that had to procure expensive raw materials bankrupted the factory and industry and then blocked the entire flow system (Hayek, 1998).

The communist industrial system did not have the necessary flexibility to adapt, fragment and use local resources, saving as much as possible. The attempt to standardize the vascularization centres, their bureaucratic connection was made to the detriment of the natural vascularization of certain centres based on skills and resources according to requirements, real needs, related to the natural tendencies of evolution. The bankruptcy of a single node in the spider web has led to the rupture of ties, the isolation of neighbouring nodes and the spread of the scenario in all directions of the economy. The problem was exacerbated by the centralization of the system, centralization that prevented a local adaptation (the only possible one), an adaptation that would have saved certain parts of the system. The bloc economy cannot go through bureaucratic decisions (Friedman, 1982).

6. Conclusions

The external conditions of a system are not stable, a permanent and especially gradual and local adaptation is needed because the very changes of the environment are gradual. Changes have a certain level of importance and are gradual, they require a certain critical mass to become significant for a certain hierarchical level of decision making. The changes are permanent, but some are important and some are not. It must be decided very carefully which change is significant and for which level of decision. Changes have a common general distribution: from many small to few large. Thus, the decentralized system can

easily adapt to small changes, of which it is not known which can increase into large changes.

Small changes in the external environment can lead to unexpected emergent effects that can only receive a specific response for a certain hierarchical decision step. The emerging effects of environmental change can in no way be reduced to a number of environmental characteristics. The emerging characteristics of the environment can only be found, described and not explained. The changes are gradual without a clear delimitation between previous and subsequent states. Changes have overlapping boundaries and you need focused attention to anticipate a favourable change (or not) in front of which you need to adapt your behaviour.

The same problem now arises globally by the specialization of a certain area on a certain type of commodity, raw material, capital good, consumer good, etc. Blocking the specialized area quickly leads to the spread of the problem throughout the global system. First the industries dependent on the first area stop and then gradually with a certain rhythm the problem spreads throughout the economic system.

The positive: the global economy is flexible and especially decentralized and can change its configuration for the use of alternative resources. Instead, it needs as much freedom and time as possible. An attempt to block the flow on national criteria will reduce the flow throughout the system; differentiated by areas. Some will be saved (suffering great shortcomings), but to the detriment of others and based on the shortcomings of others (Stiglitz, 2016).

One of the major problems of the global economic flow system is financial innovation. Without bringing real value added, it influences the way of economic organization and offers power of movement to some industries that would remain only at the project stage in the absence of these innovations (Krugman, 2013). Things go awry when financial innovations get out of hand and become art for the sake of art. If innovation no longer aims to promote the real economy but only to enrich its own creators, then we are certainly on the road to disaster.

Excessive mathematization beyond the possibility of controlling financial innovations easily leads to deception and misunderstanding of innovations by their buyers (Roubini & Mihm, 2010). Excessive mathematization plus their transmission into the flow system without the possibility of diluting the toxic elements in the innovations are the recipe for disaster. Their concentration in certain financial centres turns these centres into black holes of finance. When toxicity has reached a critical mass, the centres implode and attract into their abyss what is good and what is bad. Modern technology has achieved the performance that it can translate without dilution, in time or space, any innovation so that both positive and negative effects remain intact.

The 2008 crisis was due to financial innovations bought and spread in all global financial centres (Krugman, 2008). Toxicity hidden in mathematical formulas remained intact wherever toxic assets were hidden. The implosion of the centres when the toxicity reached critical mass was simultaneous. The radial flows from all

centres stopped simultaneously and took the opposite direction being attracted by the gravitational force of the centre.

Although the positive effects of financial innovations may diminish, it may be desirable in the case of financial innovations to have certain filters in their adoption in various financial centres associated with different states (Stiglitz, 2010). Their adoption can be done with caution, after understanding the mechanisms of operation, beneficial and less beneficial effects and after they have been fragmented and analysed carefully both in pieces and as emergent effects (effects that cannot be deduced from understanding of the parties). It is probably desirable to wait a period of time from the creation of financial innovation and its implementation in the initial financial centres and its adoption in the other centres.

With the elimination of gold as a universal currency, the only resistance to flow in the field of financial flow is represented by the prudence of financial decision makers and the rules and regulations of the financial system (Minsky, 2008). There are no perfect rules and regulations, and in general the financial regulatory system follows the trial and error method, i.e. the rules are adopted after the disaster has occurred, so caution in adopting innovation in the financial field is welcome.

References

[1] Bejan, A., & Zane, P. (2012). *Design in nature. How constructal law governs evolution in biology, physics, technology, and social organization.* New York: Anchor Books.

[2] Bejan, A. (2016). *The Physics of life*. New York City St.: Martins Press.

[3] Bejan, A, Errera, MR. (2017). Wealth inequality: The physics basis. *Journal of Applied Physics* 121, 124903, doi:10.1063/1.4977962.http://dx.doi.org/10.1063/1.4977962. http://aip.scitation.org/toc/jap/121/12. American Institute of Physics.

[4] Bejan, A, Gunes, U., Errera, M. R., Sahin, B. (2018). Social organization: The thermodynamics basis. *Int J energy Res.* 42: 3770-3779. http://doi.org/10.1002/er.4093.

[5] Bejan, A. (2020). *Fredom and Evolution. Hierarchy in Nature, Society and Science*. Gewerbestrasse: Springer Nature Switzerland.

[6] Bejan, A, Errera, MR, Gunes U. (2020). Energy theory of periodic economic growth. *Int J Energy Res*. 1-12. https://doi.org/10.1002/er.5267.

[7] Friedman, M. (1982). *Capitalism and Liberty.* Chicago: The University of Chicago.

[8] Hayek, F. (1998). *Prices and Production.* London: Routledge.

[9] Keynes, M. (2007). *The General Theory of Employment, Interest and Money*. London: The Royal Economic Society.

[10] King, M. (2017). *Money, Banking, and the Future of the Global Economy*. London: W. W. Norton & Company.

[11] Krugman, P. (2008). *The return of Depression on Economics and Crisis of 2008.* London: W. W. Norton & Company.

[12] Krugman, P. (2013). *End This depression Now*. London: W. W. Norton & Company.

[13] Minsky, H. (2008). *Stabilizing An Unstable Economy*. New York: McGraw-Hill Education.

[14] Mises, von L. (1966). *Human Action.* Chicago: Henry Regnery.

[15] Reinhart, C. M., & Rogoff, K. (2009). *This Time is Different: Eight Centuries of Financial Folly*. New Jersey: Princeton University Press.

[16] Roubini, N., & Mihm, S. (2010). *Crisis Economics: A crash Course in the Future of Finance.* London: The Penguin Press.

[17] Schumpeter, J. A. (1976). *Capitalism, Socialism and Democracy*. Abingdon: Routledge.

[18] Sedlacek, T. (2013). *Economics of Good and Evil: The Quest for Economic Meaning from Gilgamesh to Wall Street.* Oxford: Oxford University Press.

[19] Soto, H. (2006). *Money, Bank Credit, and Economic Cycles*. Alabama: Ludwig Von Mises Institute.

[20] Stiglitz, E. J. (2010). *Freefall: America, Free Markets, and the Sinking of the World Economy.* London: W. W. Norton & Company.

[21] Stiglitz, E. J. (2016). *The Euro: How Common Currency Threatens the Future of Europe.* London: W. W. Norton & Company.

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Can the Generation Gap be Explained Economically or Just Sociologically?

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Abstract

The aim of this paper is to see if the differences between the generations that live today across the globe can be explained by the psychological characteristics of the generations or by the fact that they are young and for example they spend more money on education than the old people, but this does not mean that they will be more educated than the previous generation.

For this purpose we gathered data for the main income sources and main expenditures for three main generations in the last century for the United States.

Keywords: IGen, Millennials, Baby Boomer, income, expenditure.

JEL Classification: D00, I00, J00

1. Introduction

According to specialists, every generation has its characteristics. The World Bank and other institutions have generated a time line that can divide the living population into generations. It is considered that there are four living generations currently in the workplace at the same time. According to Hammill G. (2005) these are as shown in the next chart.

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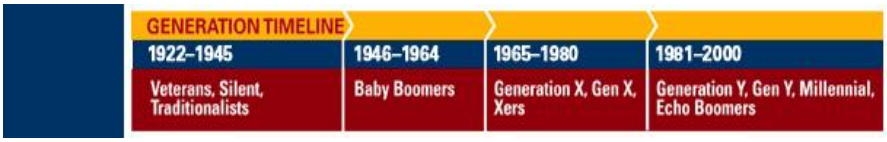
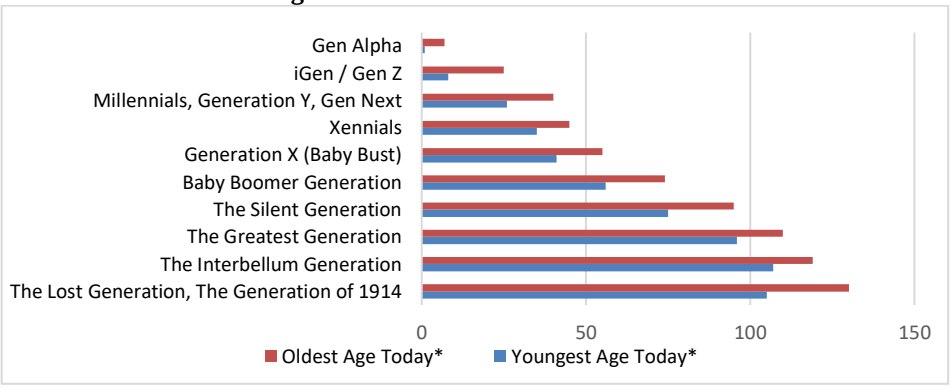


Source: https://portal.fdu.edu/newspubs/magazine/05ws/generations.htm

2. Problem Statement - What are the main characteristics that define the generations that are alive nowadays?

Generation delimitations are not the same for all cultures. The generation delimitations shown in figure no 1 are the delimitations of generations in the western culture. Japan and Asia, as well as some parts of Eastern and Western Europe, may have some other generational differences grounded on important cultural and in some cases political or economic guidelines, but mainly they accept the same delimitations as the U.S.

Figure 1. Generational Delimitations



(*age if still alive today)

Sources: https://www.careerplanner.com/Career-Articles/Generations.cfm

As can be seen nowadays in the case of most of the iGen's, they are too young to make a difference in today's world, but the elder ones could lead the war in Afghanistan. Hopefully the youngest are still studying and plan careers and jobs that are in high demand and open up new opportunities.

The main characteristics of iGen's are (J. Twenge):

- Accepting others of other backgrounds
- Prudent, not as much as risky
- Not as much alcohol and drugs use under 18 years old
- Not as much church going people
- They contest all authority figures
- Delay in starting long-time romantic relations
- Get pregnant later in life
- Less runs
- Delay in driving and fewer driving accidents among teenagers

- Less time in shopping centres
- Less likely to see a movie
- They use Instagram rather than Facebook

Meanwhile, the Millennials were raised to believe that they are special and could become whatever they dreamed of. Upon graduation, they found that was not true. IGen's witnessed this and now they are much more careful and not so positive about life.

PERSONAL AND LIFESTYLE CHARACTERISTICS BY GENERATION

	Veterans (1922–1945)	Baby Boomers (1946–1964)	Generation X (1965–1980)	Generation Y (1981–2000)
Core Values	Respect for authority Conformers Discipline	Optimism Involvement	Skepticism Fun Informality	Realism Confidence Extreme fun Social
Family	Traditional Nuclear	Disintegrating	Latch-key kids	Merged families
Education	A dream	A birthright	A way to get there	An incredible expense
Communication Media	Rotary phones One-on-one Write a memo	Touch-tone phones Call me anytime	Cell phones Call me only at work	Internet Picture phones E-mail
Dealing with Money	Put it away Pay cash	Buy now, pay later	Cautious Conservative Save, save, save	Earn to spend

Source: https://portal.fdu.edu/newspubs/magazine/05ws/generations.htm

On the other hand, iGen's may have some negative characteristics as well:

- Not as much as "personal" with others because of the time spent on smartphones or on games
- Tend not to read as many books
- Focused on growth and protection, unlike the previous cohorts
- Do not work as much in their teens
- Tend to go to bed really late at night because of high use of smartphones and social media
- May be more depressed than previous generations
- They feel lonely and useless
- Could have a higher suicide rate

3. Research Methods

For the analysis in this paper we used the deductive method. First we established the hypothesis for our theme, namely the economic and sociological gap between the living generations. We collected the necessary data using deductive reasoning and then studied research on the issue at hand. We collected the necessary data and made graphs showing the evolution of the gaps between generations. To show that the gaps between generations have been exacerbating, we have used the available data as well as recent research or studies conducted by

various institutions that study the gaps between generations. The research results are presented using the descriptive method.

4. Findings - Careers and sources of income

The differences between generations are visible in the workplace as well. The main characteristics of the four generations that are still working today are as shown in the next chart.

In the short term future, there will be fewer and fewer jobs for those with low skills, so they will be forced to develop a low-income family, therefore iGen's must start concentrating on school and lifelong learning.

Nowadays are booming the jobs in healthcare and in those fields that use high technology. On the other hand, it is not a good idea to start a career in literature or any sociological field. Anything that has to do with software and electricity is a smart career plan. Civil construction offers very few jobs because we do not build many bridges and buildings. Motor vehicle engineering is difficult, there are not many opportunities in the US, except the green cars. Occupations that need to be completed by somebody, like waiters, hairdressers and electrical engineers, are going to be demanded even in the new century, even though they are paid less. Transactions are more stable than with many other caregivers.

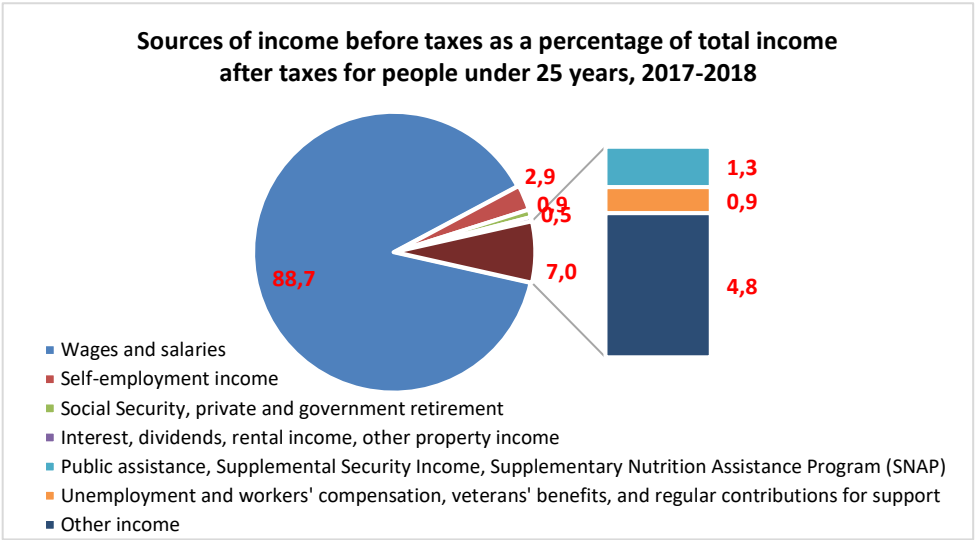
So let us see what are the main sources for the tree main generations, the iGen`ers, the Millennials, and the Baby Boomers.

WORKPLACE CHARACTERISTICS

	Veterans (1922–1945)	Baby Boomers (1946–1964)	Generation X (1965–1980)	Generation Y (1981–2000)
Work Ethic and Values	Hard work Respect authority Sacrifice Duty before fun Adhere to rules	Workaholics Work efficiently Crusading causes Personal fulfillment Desire quality Question authority	Eliminate the task Self-reliance Want structure and direction Skeptical	What's next Multitasking Tenacity Entrepreneurial Tolerant Goal oriented
Work Is ...	An obligation	An exciting adventure	A difficult challenge A contract	A means to an end Fulfillment
Leadership Style	Directive Command-and-control	Consensual Collegial	Everyone is the same Challenge others Ask why	*TBD
Interactive Style	Individual	Team player Loves to have meetings	Entrepreneur	Participative
Communications	Formal Memo	In person	Direct Immediate	E-mail Voice mail
Feedback and Rewards	No news is good news Satisfaction in a job well done	Don't appreciate it Money Title recognition	Sorry to interrupt, but how am I doing? Freedom is the best reward	Whenever I want it, at the push of a button Meaningful work
Messages That Motivate	Your experience is respected	You are valued You are needed	Do it your way Forget the rules	You will work with other bright, creative people
Work and Family Life	Ne'er the twain shall meet	No balance Work to live	Balance	Balance

*As this group has not spent much time in the workforce, this characteristic has yet to be determined.

Source: https://portal.fdu.edu/newspubs/magazine/05ws/generations.htm



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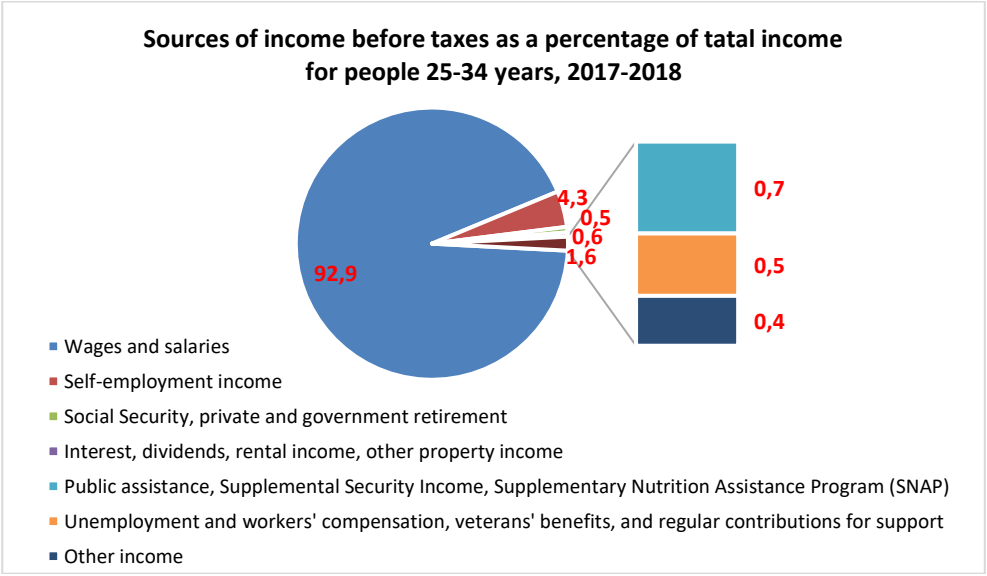
As can we noticed, the main source of income for iGen`ers, as for the other generations, is still the salary, but the percentage is significantly lower because this generation is more likely to open up their own business.



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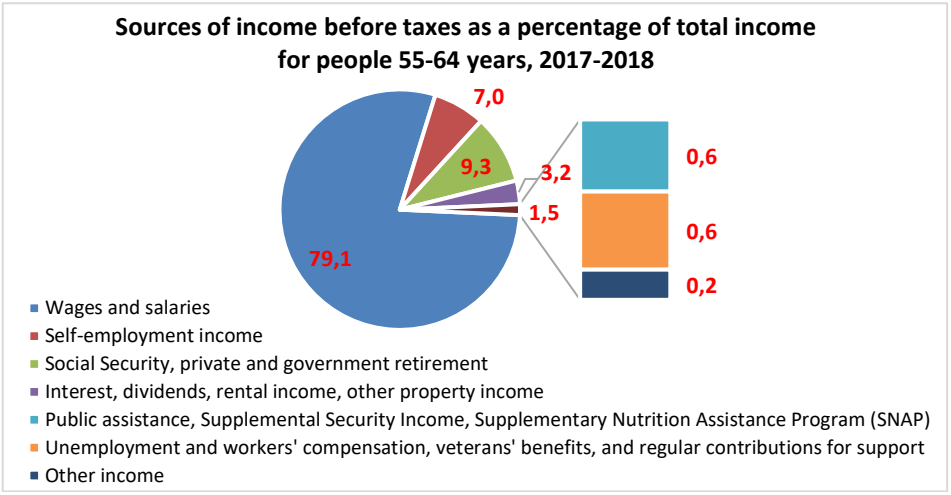

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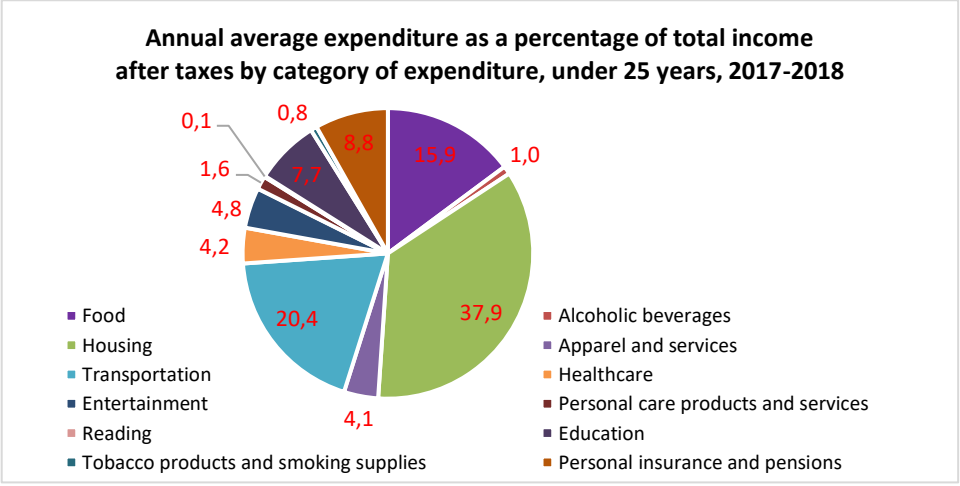
Average expenditure

Meanwhile, the **average expenditure** charts vary significantly for these three generations. Once with the adoption of automatic electric cars, the necessity for people to possess a vehicle is diminished. It is easier, cheaper and more efficient, for you just to have to go out, go to an application and be picked up by a Bolt without a driver to go where you need to. As long as a car can appear in about 5 minutes, this is the way to go. It will be interesting to see this new way of getting around shaping the automobile marketplace and how iGen'ers are going to respond to this.



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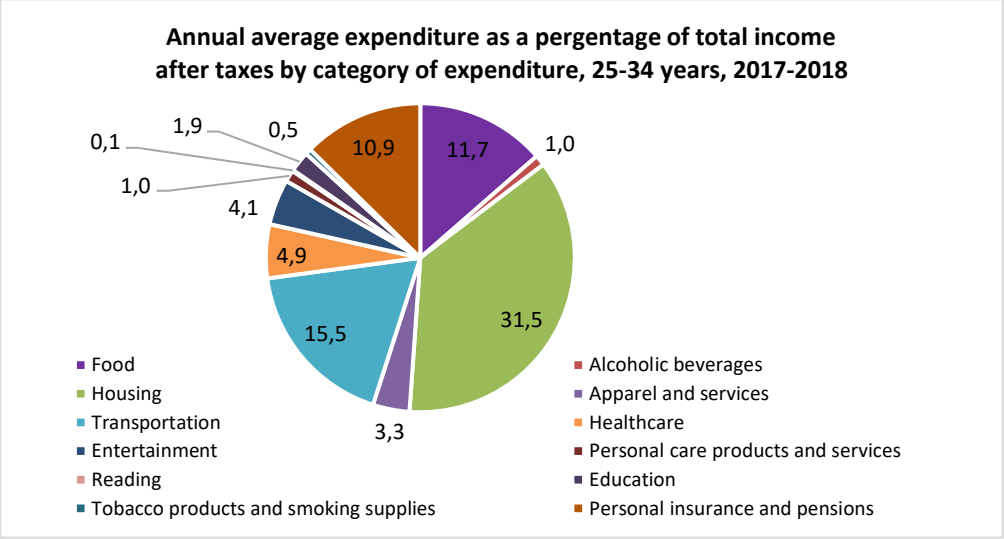
The gap between the expenditures for these three different generations can be explained also from the point of view of the psychological characteristics.

As the young generation is more attracted towards high-tech apparel than the other two generations, they are inclined to spend extra, approximately 1pp more than the Millennials and 1.5pp more than the Baby Boomers.



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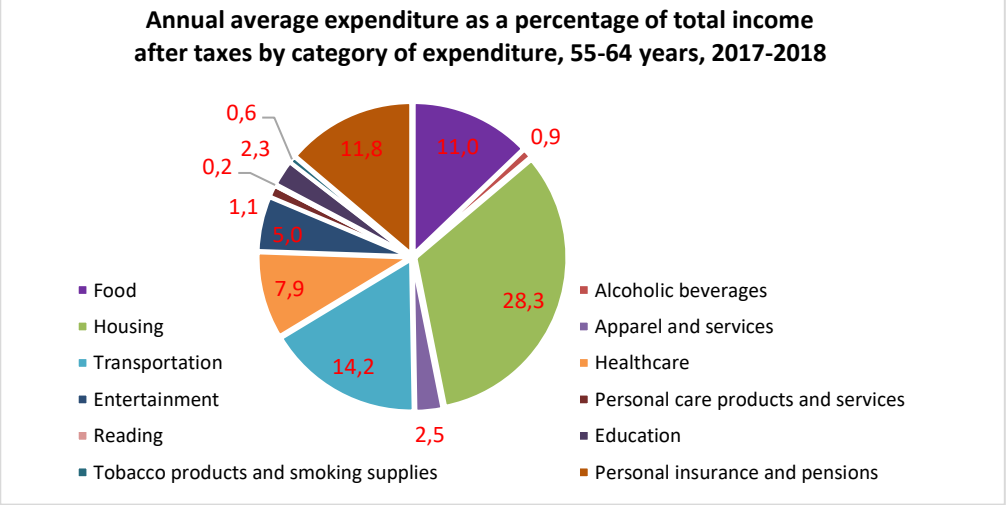

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It can also be noticed that the new generation is less inclined towards reading and more disposed towards drinking and smoking than the last two age groups, in spite of having all the information on how harmful these habits are.

5. Conclusions

The new generation will have more and more jobs related to space travel because they will concentrate on creating the first human establishments into space, given that iGen`ers are more open to the new.

Geological professions, especially in connection with the search for minerals on other planets, are likely to grow. Jobs related to virtual reality are growing because this technology is universal. iGen'ers are going to be the first ones that grow up with it and find it perfectly natural.

The newest generations will shape and reshape the world more than the previous ones did, until it will match their own unique features.

In conclusion, all the employers must understand the differences in the characteristics of all generations, in order to increase their productivity and to work effectively and efficiently. However, not only the employers that want to increase productivity have to know each generation's characteristics, policy makers too have to comprehend them, so they can better understand the needs of every generation in order to effectively deal with each individual.

References

[1] Acebel Rousseau, M. (2008). Closing the workplace generational gap. *Miami Herald*, http://miamiherald.typepad.com/boomer/2008/02/closing-the wor.html#ixzz1Pfj1SD00.

[2] Bloomberg Business Week (2007). Bridging the Generation Gap, http://www.business week.com/magazine/content/07_38/b4050063.htm.

[3] D'Adonno, B. (2004). Bridging the Generation Gap, *Today's Officer*, http://www.moaa. org/TodaysOfficer/Careers/Generation_Gap.asp.

[4] Gurchiek, K. (2009). Gen Y Poses Unique Management Challenges, *Society for Human Resource Management*. http://www.shrm.org/hrdisciplines/employeerelations/articles/ Pages/GenYChallenges.aspx.

[5] Harvard Joint Centre on Housing Perspectives (2019). *US Census B - National Vital Statistics*.

[6] Hammill, G. (2005). Mixing and Managing Four Generations of Employees. *FDU Magazine*. http://www.fdu.edu/newspubs/magazine/05ws/generations.htm.

[7] Howe, N., and Strauss, W. (1992). The New Generation Gap. *The Atlantic*. http://www. theatlantic.com/past/docs/issues/92dec/9212genx.htm.

[8] Karp, H., Fuller, C., Sirias, D. (2002). Bridging the Boomer Xer Gap: Creating Authentic Teams for High Performance at Work. *Palo Alto*, Calif.: Davies-Black Publishing.

[9] Kersten, D. (2002). *Today's Generations Face New Communications Gap*, USA Today.

[10] Robinson, M. T. (2019). *The Generations Which Generation are You?*

[11] Sago, B. (2000). Uncommon Threads: Mending the Generation Gap at Work, *Executive Update*.

[12] Shrestha, L. B. (2006). Life Expectancy in the United States, *CRS Report for Congress*, http://aging.senate.gov/crs/aging1.pdf.

[13] Twenge, J. (2019). *iGen, Why Today's Super-Connected Kids are Growing Up Less Rebellious, More Tolerant, Less Happy*.

[14] U. S. Bureau of Labour Statistics Consumer (2019). *Expenditure Survey*, September, https://www.bls.gov/regions/midwest/data/consumerexpenditures_selectedareas_table .htm.

[15] Walston, S. F. (1999). *Distinguishing Communication Approaches Across Generations*, (online publication), http://www.walstoncourage.com/pages/articles/generation.htm.

[16] Williams, R. (2009). Why Are You Not Like Me? The Generational Gap in the Workplace, *Psychology Today*. http://www.psychologytoday.com/blog/wired-success/ 200909/why-are-you-not-me-the-generational-gap-in-the-workplace.

[17] World Bank (2014). *Life expectancy*, http://www.google.com/publicdata?ds=wb-wdi&met_y=sp_dyn_le00_in&idim=country:USA&dl=en&hl=en&q=life+expectancy# ctype=l&strail=false&nselm=h&met_y=sp_dyn_le00_in&scale_y=lin&ind_y=false&rd im=country&idim=country:USA&tdim=true&hl=en&dl=en.

[18] Zemke, R., Raines, C., Filipczak, B. (2000). *Generations at Work: Managing the Clash of Veterans, Boomers, Xers, and Nexters in Your Workplace*. New York, N.Y.: American Management Association.

[19] https://www.bls.gov/cex/.

[20] https://www.vanityfair.com/culture/2015/10/generation-gap-guide.

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Economic Growth versus Coronavirus Pandemic

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Abstract

The aim of this paper is to analyse the evolution of the Gross Domestic Product (GDP) and inflation within the European Union in the year 2020 and the economic projections for 2021. The Coronavirus pandemic triggered unexpected changes in the global economy as many sectors were severely affected by the lockdown. In this context, the impact of the Coronavirus pandemic on the economic growth in the EU-27 Member States will be outlined. In the process towards the economic recovery, economies should play strategically to avoid massive indebtedness and further inflation. Furthermore, alternative scenarios of economic policies to restart the economies shall be considered.

Keywords: Economic growth, GDP, inflation, Coronavirus pandemic, indebtedness.

JEL Classification: F43, E51, F63, O47

1. Introduction

The European Union works as a single market of 27 countries and represents a major world trade power. The economic policy of the European Union is aiming at creating jobs and boosting growth through smarter use of financial resources, removing barriers to investment and providing technical assistance to investment projects (Maza et al., 2012).

The European Union has ensured that it develops a single internal market through a standardised system of laws that apply in all Member States. EU policies aim to ensure the free movement of persons, goods, services and capital in the internal market and the adoption of legislation in the area of justice and home affairs and the perpetuation of common policies on trade, agriculture, fisheries and regional development.

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The effects of the Coronavirus pandemic are visible at European level and all Member States are trying to take the best measures to maintain economic activity at a pace as normal as possible, while respecting safeguards and preventing the spread of the virus.

The current economic forecast is uncertain during this period as it is linked on one hand to the duration and extent of the Covid-19 outbreak and, on the other hand, to the potential changes in consumer behaviour after the end of the Coronavirus crisis. It is also envisaged that generalised quarantine measures adopted so far to combat the outbreak of Coronavirus pandemic can lead to large losses in most economic sectors.

2. Problem Statement

The economy of the EU-27 Member States faced a strong recession in the first half of 2020 due to the Coronavirus pandemic across the globe. With an average fall of around 7.5% in world's Gross Domestic Product (GDP), the Coronavirus pandemic seems to push the global economy towards the deepest recession since *the Great Depression* and to the deepest output contraction since World War II (European Commission, 2020). Inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output (Friedman, 1970). Inflation requires monetary growth to facilitate and enable it (Goodhart, 2020). In the first quarter of 2020 the household real consumption per capita dropped by 3.0% (Eurostat, 2020). This was mainly due to 2 types of savings: the *involuntary savings* and the *precautionary savings* (Goodhart, 2020). The involuntary savings are caused by the impossibility of people to purchase goods or services due to the lockdown measures. The precautionary savings are due to a change in the financial behaviour of people, who during pandemics learn the hard lesson to put aside money for unexpected events.

The current governmental strategies have as main objective the improvement of society's welfare. The economic development and the increase in the society's welfare result in a sustainable economic growth (Garin et al., 2016). The process of economic growth is perceived as the fundamental drive to increase the life standard, which is one of the most important events in people's life. For an effective development of the European Union, we strongly believe that focus should be oriented towards the achievement of economic growth in all sectors of the market economy. Moreover, this process should be aligned to the economic growth of the EU-27 Member States and their welfare increase (Anghelache et al., 2017).

Having as objective the economic growth in the EU Member States, one of the drivers of economic growth is consumption. From this perspective the Coronavirus pandemic represents a major shock for the economies with very serious socio-economic consequences. Despite the fast and comprehensive economic responses, the EU economy will have a deep recession in 2020 as the Coronavirus pandemic has severely affected consumer spending, industrial production, investment, trade,

capital flows and supply chains. In addition, the gradual relaxation of the containment measures that are announced in the next period should pave the way for recovery. However, the losses incurred this year by the EU economy are not expected to be recovered before the end of 2021.

The management of the European Union's policies will be ingested to achieve a balance of effective policy measures at EU and national level in response to the crisis considered crucial to limit the economic damage and to facilitate a rapid and robust recovery so that economies can return to the path of sustainable and inclusive growth.

3. Research Questions/Aims of the research

The aim of this article is to analyse the evolution of the GDP in the first quarter of 2020 and possible projections for the future periods correlated with the annual inflation rates in the EU-27 Member States. Beside the statistical analysis of the mentioned macroeconomic indicators, we have also intended to analyse the major economic measures taken by the European institutions to boost the European economy and, especially those sectors severely affected by the Coronavirus pandemic.

4. Research Methods

The research methods applied in this study are descriptive statistics of the macroeconomic indicators of interest for us obtained from the Eurostat database. Also, we used qualitative methods of research to analyse the economic measures taken at EU-27 level to alleviate the Coronavirus global pandemic.

5. Findings

Figure 1 below indicates the GDP growth rates in the first quarter of 2020 highlighting in percentage the change over the previous quarter. In the EU-27 Member States, Ireland (+1.2%), Bulgaria (+0.3%) and Romania (+0.3%) registered positive growth rates compared to the previous quarter. At the opposite pole, registering negative growth, there are France (-5.3%) and Italy (-5.3%) followed closely by Spain (-5.2%) and Slovakia (-5.2%).

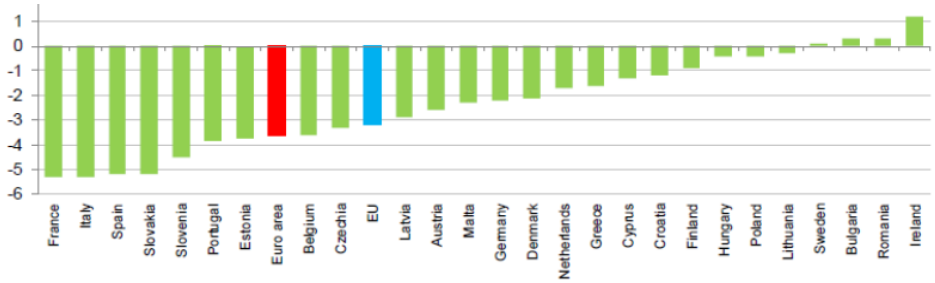

Figure 1. GDP growth rates in the first quarter of 2020
Source: Eurostat (2020)

The projections of the economic output for the second quarter of 2020 indicate a deeper curve compared to the first quarter of the year (European Commission, 2020), motivated by the prolongation of the confinement measures.

The impact of Coronavirus on inflation is still uncertain although in the first semester of 2020, despite the market closures, disinflation has dominated (La Caixa, 2020). Figure 2 below indicates that the lowest annual rates were registered in Cyprus (-2.2%),Greece (-1.9%) and Estonia (-1.6%), while the highest annual rates were recorded in Poland (3.8%) and Czechia (3.4%). The collapse in output increases downside the inflationary risks. One of the highest risks for inflation is the excess of monetary and fiscal stimulus that can bring back inflation. Some authors (Blanchard, 2020) speak about the 'wrong high inflation scenario', which requires the combination of a large increase in the debt-to-GDP ratio and a very large increase in the neutral interest rate of fiscal dominance over monetary policy.

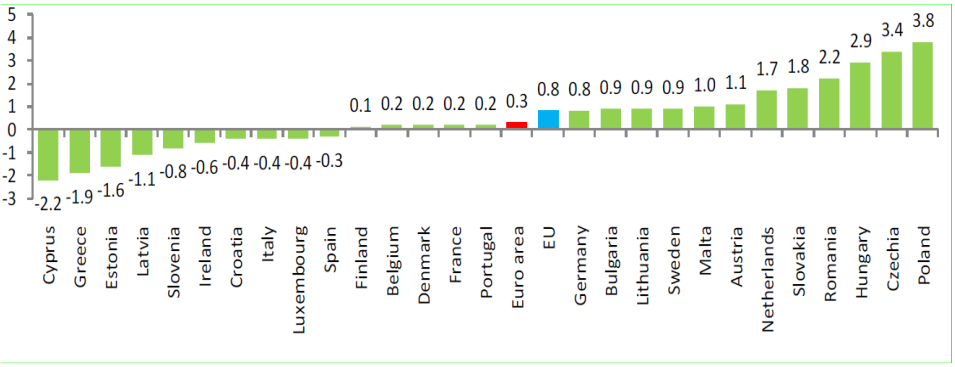

Figure 2. Annual inflation rates (%) in June 2020
Source: Eurostat (2020)

As the statistical analysis shows, the economic situation of the EU-27 Member States is highly affected by Coronavirus pandemic. It is important to highlight that the intensity of the impact is different from a region to another, depending on the specificities of each country. As GDP is strongly correlated with employment, in countries in which a larger share of population is employed in tourism and in the sectors related to it, GDP losses are bigger as compared to countries in which a larger share of population is employed in the public sector (Conte et al., 2020). The measures taken to alleviate the economic consequences of the crisis consider the magnitude of the impact in each country, offering loans to euro area Member States that constitute up to 2% of the country's GDP, but not exceeding EUR 240 billion (European Stability Mechanism, 2020). Another important measure is the introduction of temporary flexibility of EU funds, so as to allow transfers between funds, regions, focusing on the most affected members of society (European Council, 2020). The European Central Bank has managed the monetary policy during the Coronavirus pandemic crisis by introducing EUR 1 350 billion pandemic emergency purchase programme (European Central Bank, 2020).

6. Conclusions

All the responsible institutions have unified their forces and introduced the necessary measures to fight the Coronavirus pandemic, which has, along the irreversible human losses, negative economic consequences that will affect the quality of life of the majority of people. The popular solution proposed by President Bush after the terrorist attack in September 2001, namely to "go shopping" cannot be applied in this situation, because of the rapid spread of the virus and the fear generated by the Coronavirus pandemic across the globe. The consumer behaviour changed and most surely, it will be further affected in the following period, depending on how the pandemic will evolve. However, there is hope that the measures taken both at the European level and at national levels will help to recover the economy and to determine economic growth in the next year 2021.

References

[1] Anghelache, C., and Anghel, M. G. (2017). Econometric methods and models used in the analysis of the factorial influence of the gross domestic product growth. *Network Intelligence Studies*, V(9), pp. 67-78.

[2] Blanchard, O. (2020). *High inflation is unlikely but not impossible in advanced economies*, https://www.piie.com/blogs/realtime-economic-issues-watch/high-inflation-unlikely-not-impossible-advanced-economies.

[3] Conte, A., Lecca, P., Salotti S., and Sakkas, S. (2020). The territorial economic impact of COVID-19 in the EU. A Rhomolo Analysis. *Territorial Development Insights Series*, European Commission.

[4] European Central Bank (2020). *ECB announces €750 billion Pandemic Emergency Purchase Programme (PEPP).* https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200318_1~3949d6f266.en.html.

[5] European Commission (2020). *Economic forecast documents*. https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/summer-2020-economic-forecast-deeper-recession-wider-divergences_en.

[6] European Council (2020). *Report on the comprehensive economic policy response to the COVID-19 pandemic.* https://www.consilium.europa.eu/en/press/press-releases/2020/04/09/report-on-the-comprehensive-economic-policy-response-to-the-covid-19-pandemic/.

[7] European Stability Mechanism (2020). *What is ESM pandemic crisis support against COVID-19?*. https://www.esm.europa.eu/content/europe-response-corona-crisis.

[8] Eurostat (2020). Retrieved from https://ec.europa.eu/eurostat/data/database.

[9] Friedman, M. (1970). The Counter-Revolution in Monetary Theory. Published as *IEA Occasional Paper Number* 33. London, United Kingdom.

[10] Garin, J., Lester, R., and Sims, E. (2016). On the Desirability of Nominal GDP Targeting. *Journal of Economic Dynamics and Control*, 69, pp. 21-44.

[11] Goodhart, C., Manoj, P. (2020). *Future imperfect after coronavirus.* https://voxeu.org/article/future-imperfect-after-coronavirus.

[12] La Caixa (2020). *The impact of the COVID-19 outbreak on European inflation*. https://www.caixabankresearch.com/en/economics-markets/inflation/impact-covid-19-outbreak-european-inflation.

[13] Maza, A., Hierro, M., and Villaverde, J. (2012). Income distribution dynamics across European regions: Re-examining the role of space, *Economic Modelling*, 29(6), pp. 2632-2640.

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Responding to COVID 19: Gender Inequality Challenges

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Abstract

Gender inequality is a major issue present all over the word including in the European Union. Policies promoted to reduce gender inequality have contributed to an improvement of the situation but have not resolved it. In the context of the "lockdown" created by the spread of the COVID-19 virus, the entire population suffered, but women were significantly more affected. The effects felt on the labour market were significant and immediate, both on demand and on labour supply. Thus, many people lost their jobs, some became unemployed, and others had to quickly adapt to new changes (telework, reduced wages, changes in work, etc.). Women represent the category of employees most affected by the rules on social distance because the areas that suffered the most were those in the light industry: education, hotel and restaurant services, care and beauty services, etc. In this article, we will analyse the evolution of gender inequality in the EU in recent years as well as the effects of the COVID-19 pandemic on it and we will suggest some policy recommendations. The pandemic is deepening pre-existing inequalities, exposing the vulnerabilities in social, political and economic systems, which led to an increase in the unemployment rate among women and also in the inequality reflected by the pay gap.

Keywords: Gender inequality, COVID-19 pandemic, unemployment rate for women.

JEL Classification: J16, E24, J70

1. Introduction

Ensuring equality between women and men in education, political and economic decision process, labour market, earning potential, is essential to build a sustainable, inclusive and resilient Europe, with a higher growth potential. The European institutions are increasingly concerned about gender inequality. The introduction of the European Pillar of Social Rights has brought to the fore a greater importance of gender equality in the European Semester.

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The entire European Union is now facing different levels of gender inequality and this is why the situation created by the current global crisis requires urgent responses in order to mitigate the economic and social impact. In terms of economic sectors, among the most affected are the social sectors, and in terms of population, women are the most vulnerable category. Given the existing concerns about reducing gender inequalities, the Covid-19 pandemic deepens inequality by further jeopardizing the prospects for sustainable, inclusive growth as well as economic resilience.

The purpose of this article is to analyse the evolution of gender inequality, both before and during the pandemic crisis, with a view to recommend a set of viable measures that will have the effect, in the short term, in mitigating economic and social impact, and in the long term, in considerably reducing gender inequality and increasing women's participation in the labour market.

2. Problem Statement

Nowadays, people face challenges that have an immediate impact in terms of lifestyle, work and income. The COVID-19 pandemic affects all countries, destroys jobs, creates poverty and jeopardizes the gains of gender equality of the recent decades (Fabrizio et al., 2020).

Regarding women's participation in the labour market, Lagarde (2013) affirms that for a decade or more, women's participation in the workforce has been stuck at about 50 percent, whereas male participation has remained consistently – and comfortably – close to 80 percent. Another study that analyses the difference between women and men in the labour market highlights that across countries, the average female labour force participation rate is still 20 percentage points lower than the male rate, and gender gaps in wages and access to education persist (Fabrizio, et al., 2020). Closing gender gap in employment could increase GDP in some countries by 35% of which 7-8 percentage points are productivity gains due to gender diversity (Lagarde, 2019).

Gender inequality is correlated with human development, more exactly, there is research concluding that low inequality in human development required reducing the loss coming from gender inequality. Investing in women's equality and lifting both their living standards and their empowerment are thus central to the human development agenda and to achieving the Sustainable Development Goals (United Nations Development Programme, 2020).

The current crisis caused by the spread of the COVID 19 virus is different from all other crises, due to an unprecedented output contraction and the fastest increase in unemployment on record. If in the 2008 crisis more men were affected, this time it is estimated that women will be most affected by the COVID crisis because the current crisis has a big impact on service occupations with high female employment shares, such as restaurants and hospitality (Alon T. et al., 2020).

An analysis of the costs of the pandemic with COVID-19 in the US, in terms of both the health risks and economic burdens, shows that they will be borne by the most disadvantaged categories of society. The authors mention a vicious circle

present in this crisis, the pandemic will affect inequalities and the increase in inequalities will exacerbate the spread of the virus and will undermine any ensuing economic recovery efforts. Moreover, the overall increase in household production time is likely to fall mostly on women, further widening the gender gap in contributions to household work − a key source and marker of gender inequality (Nassif-Pires L. et al., 2020). Another effect caused by social distancing is related to the deterioration of mental health, which is estimated to affect especially women (Etheridge and Spantig, 2020).

The International Labour Organisation (2020) proposes several measures for the post-COVID-19 world of work like: free from discrimination and gender stereotypes, more time and money to care, more women leading the way, free from violence and harassment. Other studies recommend measures like relaxing eligibility of social protection programs more long-lasting. This type of measure can enhance automatic stabilizers and help tackle rising poverty and inequality (International Monetary Fund, 2020).

3. Aims of the research

The present research focuses on the evolution of gender inequalities in the European Union. We analyse the situation of gender inequality before the crisis caused by COVID-19 as well as after its onset. We demonstrate through a qualitative analysis of the data that the health crisis has accentuated gender inequalities, we analyse the measures taken by the EU member states and we make some recommendations.

4. Research Methods

For this analysis we used the deductive method, and we established the hypothesis of the paper, namely that the crisis generated by COVID-19 accentuated the problem of gender inequalities. Using deductive reasoning we collected data and studied research on this issue. We collected data on gender inequalities at EU level before the COVID-19 crisis and made graphs showing their evolution. To demonstrate that the COVID-19 crisis has exacerbated gender inequalities, we used the data available at this time as well as recent research or studies by various institutions that predict the impact of this crisis. We presented the research results using the descriptive method.

5. Findings

Gender inequality is present all over the world, including in the European Union. Whether we refer to the payment of work, the employment rate on the labour market, management positions, the level of education, family responsibilities, women are disadvantaged compared to men. One of the fundamental objectives of the EU is to achieve social cohesion, which can only be accomplished if specific convergence processes are carried out, including the convergence process on gender equality. Various measures have been taken at EU

level to make progress in achieving equality between women and men. As can be seen in Figure 1, the EU Gender Equality Index increased by 4 points in the period 2005-2017. Although there has been an increase in the index, this increase is insignificant, and some EU countries, such as Lithuania, Poland and the Netherlands, have seen a decrease in the index between 2015 and 2017.

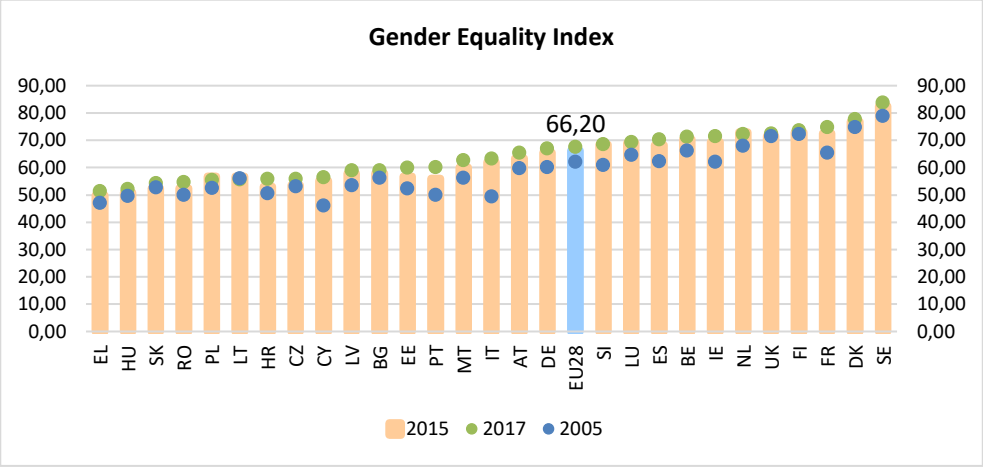

Figure 1. Gender inequality index
Source: Gender inequality index 2019

At EU level, we find substantial differences in the participation of women and men in the labour market, the level of pay and the risk of poverty or social exclusion. The lower the rate of integration of women into the labour market is, the higher risk that they will suffer from poverty or social exclusion and will be much more affected by economic instability.

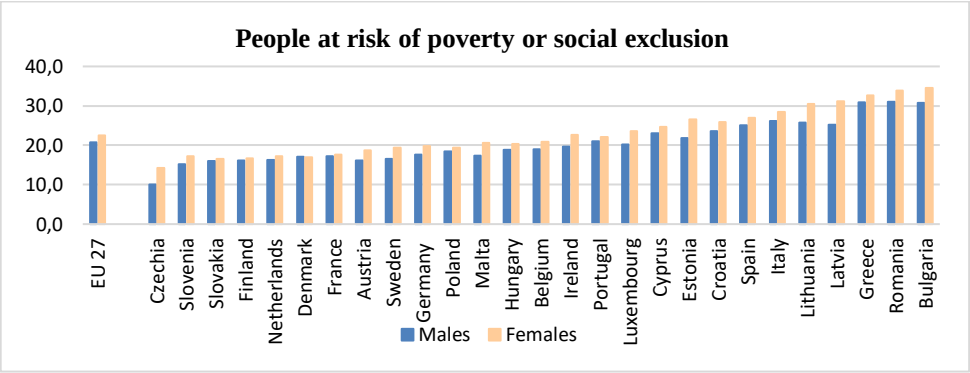

Figure 2. People at risk of poverty or social exclusion by sex (2018)
Source: Eurostat

Both inequality and poverty are considered crucial current economic and social issues, with negative macroeconomic consequences. Reducing the risk of poverty

and social exclusion is a key component in the growth strategies of the European institutions. Despite the efforts and importance offered, the gap still persists.

Regarding people at risk of poverty or social exclusion, we note that in all EU countries, women are much more at risk, but the gender gap varies between countries depending on the measures and policies adopted, but also on the role of women in economic and social activities. The biggest difference is observed in Central and Eastern European states.

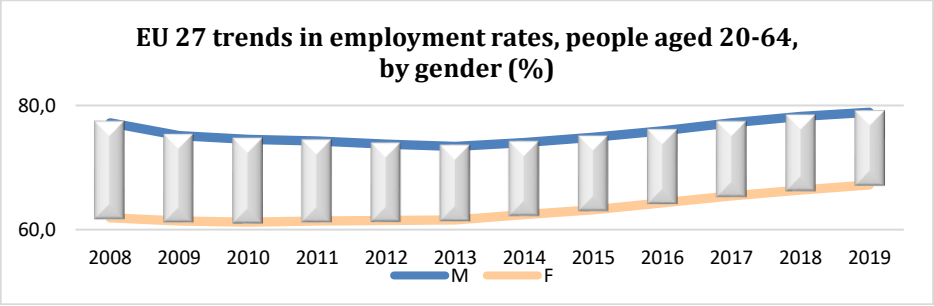

Figure 3. EU 27 trends in employment rates, people aged 20-64, by gender (%)
Source: Eurostat

Employment rates in the EU continue to improve in line with continued growth and improved labour market conditions. Even though the employment rate of women is constantly increasing, gender inequality in the labour market persists. In 2019, the employment rate of men was 78.9%, compared to 67.2%, the difference being 11.7 percentage points

There are many studies (Ostry and others 2018; Lagarde 2018) showing that the inclusion of women in the labour market and their involvement would bring considerable benefits because men and women bring the same contribution to the labour market, the difference lying in skills, ideas and visions.

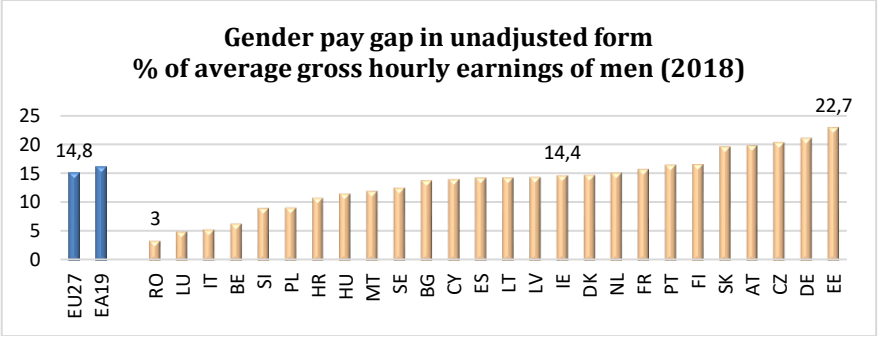

Figure 4. Gender pay gap in unadjusted form % of average gross hourly earnings of men
Source: Eurostat

The pay gap between women and men is considerable, but it varies from country to country depending on the characteristics of the labour market. For example, there are countries with a gap of less than 10% such as Poland, Slovenia, Belgium, Italy, Luxembourg, Romania, but there are also countries with considerable differences of over 20% like Czech Republic, Germany, Estonia.

It is important to note that a smaller gap does not necessarily mean that women are paid better in general. A lower pay gap between women and men frequently occurs in countries with a lower employment rate. A high wage gap is usually characteristic of a labour market in which women are more concentrated in the social or low-wage sectors (Romania's example) or in which a considerable share of women are employed part-time.

Gender Inequality and COVID-19 crisis

From health to the economic sector, but also to social protection, women around the world face major challenges in terms of equal opportunities. Despite the progress made in recent years, inequality between men and women in the labour market remains a challenge in achieving economic growth. Equality between women and men is an important goal in the development process. The lower the gender inequality is, the more achievable the development prospects of a society are. Creating better opportunities for women can help both mitigate the negative impact of declining employment and increase education among the population.

The alarming spread of COVID19 across Europe has generated an economic crisis with socio-economic effects that are destroying economic and social cohesion. The impact of the pandemic on the labour market is felt more among women as they tend to work mostly in the social sectors, which have been severely affected by the "lockdown".

Compared to the previous crises that hit the global economy, where the effects were pronounced on heavy, male-dominated industries, such as the manufacturing and construction sectors, the crisis caused by the Covid-19 pandemic has spread more in the social sectors, education, health, hotel services, etc., which tend to have a much higher share of women.

For many households, measures taken during the pandemic have exacerbated the economic situation and further diminished women's decision to engage in paid work. Thus, women's incomes as well as employment in the labour market are declining.

Given the pandemic context, social sectors such as education, hotel services, beauty and care services, etc., were forced to suspend or substantially restrict their work, therefore a very high percentage of women lost their jobs. Many women have had to work from home and take care of children at the same time, or oversee the process of children’s online courses.

EU countries have experienced significant variations in terms of unemployment among women. Thus, it increased in the first months of 2020 as shown in the chart below. At EU27 level, the average unemployment rate for women is around 6.9% in the first months of 2020 compared to 6.7% in 2019. Regarding the European

Union countries, the evolution was not identical, with some countries registering increases in January and February and other states registering increases in March and April. Italy, Spain, Greece are countries where the unemployment rate among women increased in the first two months of the year and Romania, Germany, Finland, Lithuania are countries that recorded increases in March and April. Preliminary data for June show that the situation for some countries continues to worsen, the unemployment rate among women also increasing in June in Spain, Denmark, Malta, Austria.

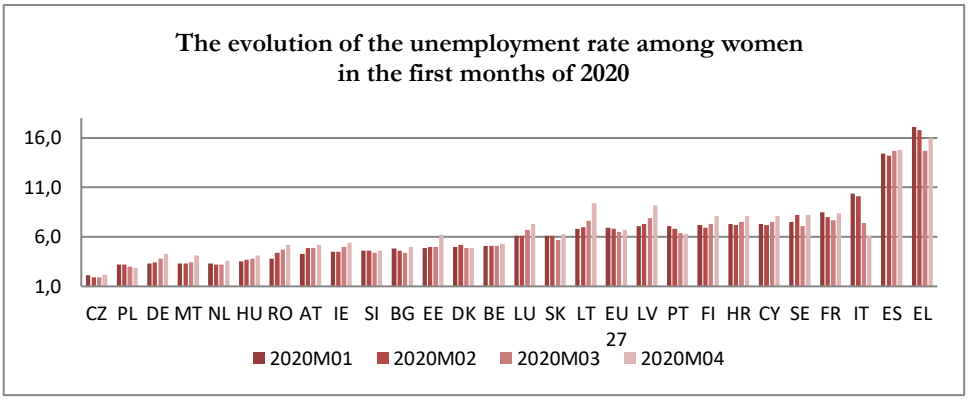

Figure 5. The evolution of the unemployment rate among women in the first months of 2020 (%)
Source: Eurostat

The health crisis caused by the spread of the COVID19 virus has put pressure on health systems and on the entire economy. The heavy burden caused by the pandemic is felt by both the population and the economic agents. The number of cases has rapidly risen in the member states and forced the authorities from many states to establish a state of emergency and restrict the right of movement of the population. European economies have experienced a shock of both supply and demand at the level of markets that have required immediate and coordinated measures.

One of the most affected sectors of the economy is tourism. The ban on non-urgent travel on national and EU territory has had a major impact on tourism but also on hospitality services. In these areas, the number of employed women is higher than that of men, the International Labour Organization estimating that women make up between 60%-70% of all workers in the tourism industry. Moreover, young women, migrant workers and the rural population work in this sector, many of them earning the minimum wage. The European Parliament estimates that about 13 million people work in the tourism industry, and the losses that this sector will suffer are estimated at about 1 billion euros per month. In one of the most affected countries in the EU, Italy, the Italian Tourism Federation points out that Italy stands to lose around 60% of its tourists this year.

The measures taken by EU member states for the protection of women, severely affected by the health crisis, are multiple, but mainly refer to unemployment benefits for the dismissed, maintaining open nurseries for children of families that are working in the front line, benefits for those who had own business.

Most states decided to close kindergartens and schools, which created an additional problem for parents who worked from home and had to take care of children at the same time, but also for parents who worked in the front line. Austria, France, Germany and the Netherlands have allowed some childcare facilities to remain open, with a skeleton staff, to look after the children of essential service workers. Italy has introduced vouchers for alternative care arrangements, worth € 600 (€ 1,000 for health workers) or working parents with children have the possibility to take 15 days of parental leave, at 50 per cent of pay if the children are below the age of 12, and unpaid if they are older. In the United Kingdom, some cooperatives have used their own funds and contributions from community members to support childcare services for COVID-19 frontline workers. In Romania, extra days off have been introduced for working parents. In Germany, childcare benefits have been expanded to support low-income parents, and access to basic income support has been made easier for the self-employed.

The COVID-19 outbreak has shown that the health system was not prepared for a pandemic due to the low investment in this sector. The large number of patients, the lack of necessary materials and equipment, quickly put pressure on the health system. This pressure was felt most by employees in the medical system, who in many European countries began to take very long shifts without adequate protective equipment. According to the International Labour Organization, there are approximately 136 million workers worldwide in the health and social work sectors, 96 million of whom being women. At the level of the European Union, the percentage of women among all workers employed in health and social work is between 61-70% in Italy, between 71-80% in countries such as Romania, Spain, France, Hungary, Germany and between 81-90% in Poland, Portugal, Czech Republic, and Lithuania. Thus, even in this situation, women were more exposed to contact the virus, they often worked overtime on low wages, and after work they also took care of household chores. Many of them also felt high emotional stress caused by the fear of transmitting the virus to family members.

The European Commission's forecasts for the evolution of GDP at EU level in 2020 are not encouraging (Annex 1). If the spring forecast indicates a contraction in GDP of EU27 of 7.4%, the summer forecast increased the percentage to 8.3%. Among the most affected countries will be Spain, Italy, France, Croatia, Portugal, which also record the highest number of cases of COVID19 infections. This is a difficult time for all EU countries, with the economy slowing down, the number of unemployed rising and the risk of small businesses going bankrupt. The socio-economic effects of this pandemic must be taken seriously by local authorities and EU institutions. Complementary measures are needed to help women who have lost their jobs and those who will lose them, such as unemployment benefits, retraining courses, vouchers for the goods needed to raise children. If effective measures are

not implemented, the number of women at risk of poverty or social exclusion will increase alarmingly, as will the number of children in their care.

6. Conclusions

Through our research we have shown that in the current crisis caused by the COVID-19 virus, women have been much more affected than men. We analysed data on gender inequalities in the EU before the pandemic and data available since the beginning of the health crisis. As a conclusion, women have been more affected because they are the majority in the social fields that have suffered from this crisis. The UE economy is forecast to contract by 8.3% in 2020, which means that many women will lose their jobs. At national and European level, coordinated and effective measures are needed to reduce socio-economic effects that negatively affect economic and social cohesion and increase inequalities.

A more resilient, inclusive and sustainable economy requires action to promote gender equality by the government. It is very important that during and after the COVID-19 crisis, concrete measures be put in place to place women's work at the heart of response plans and subsequently recovery.

The main recommendation to reduce gender inequality in the European Union is to create favourable conditions for women in the labour market and to encourage them to engage in paid work.

Another recommendation concerns investment in education and educational infrastructure so as to create the favourable framework for better inclusion in the education system. At the same time, subsidies for mothers and children are needed to encourage the birth rate so that they are not exposed to the risk of poverty or social exclusion.

References

[1] Alon, T. et al. (2020). The impact of COVID-19 on gender equality, *NBER Working Paper Series*, Working Paper 26947.

[2] Etheridge, B. et al., (2020). *The Gender Gap in Mental Well-Being During the Covid-19 Outbreak: Evidence from the UK*, ISER Working Paper Series, No. 2020-08.

[3] European Commission, (2019). *Report on equality between women and men in the EU*, available at https://ec.europa.eu/info/sites/info/files/aid_development_cooperation_fundamental_rights/annual_report_ge_2019_en.pdf.

[4] European Commission, (2020), *European Economic Forcast. Summer 2020*, available at https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/summer-2020-economic-forecast-deeper-recession-wider-divergences_en.

[5] European Institute for Gender Equality (2020). *Gender Equality Index 2019 Work-life balance*, available at https://eige.europa.eu/publications/gender-equality-index-2019-work-life-balance.

[6] European Committee of the Regions, (2020). *Economic Bulletin No. 7*, COVID-19 impact and response measures, available at https://cor.europa.eu/ro/news/Pages/ECON-responses-at-local-level-Covid-19-crisis-07.aspx.

[7] Eurostat, available at https://ec.europa.eu/eurostat/home?

[8] Fabrizio, S. et al (2020). *The COVID 19 gender gap*, available at https://blogs.imf.org/2020/07/21/the-covid-19-gender-gap/.

[9] International Labour Organisation, (2020). *The COVID-19 response: Getting gender equality right for a better future for women at work*, available at https://www.ilo.org/wcmsp5/groups/public/---dgreports/gender/documents/publication/wcms_744374.pdf.

[10] International Monetary Found, (2013). *Women, Work, and the Economy: Macroeconomic Gains from Gender Equity*, IMF Staff Discussion Note 13/10 Washington.

[11] International Monetary Found, (2016). *Gender Equality and Economic Diversification*, IMF Working Paper 16/140.

[12] International Monetary Found, (2018). *Gender and Finance: A Case for Closing Gaps*, IMF Staff Discussion Note 18/05. Washington.

[13] International Monetary Found,(2018). *Economic Gains from Gender Inclusion: New Mechanisms, New Evidence*, IMF Staff Discussion Note 18/06." Washington.

[14] International Monetary Found, (2019). *Finance & Development*, 56 (1).

[15] International Monetary Found,(2020*). Finance and Equality*, IMF Staff Discussion Note 20/01. Washington.

[16] International Monetary Found, (2020). *A Crisis Like No Other, An Uncertain Recovery*, Washington.

[17] Lagarde, C. (2013). *Finance & Development*, IMF, 50 (2).

[18] Lagarde, C., Ostry, J. (2018). *The macroeconomic benefits of gender diversity*, available at: https://voxeu.org/article/macroeconomic-benefits-genderdiversity.

[19] Nassif-Pires, L. et al. (2020). *Pandemic of inequality*. Levy Economics Institute of Bard College, Public Policy Brief, No. 149.

[20] Ostry, J. et al., (2018). Economic Gains from Gender Inclusion: New Mechanisms, *New Evidence. IMF Staff Discussion Note* 18/06.

[21] United Nations Development Programme (2020). *Tackling social norms. A game changer for gender inequalities*, available at *https://www.empowerwomen.org/en/resources/documents/2020/03/tackling-social-norms---a-game-changer-for-gender-inequalities-2020-human-development-perspectives?lang=en.*

Appendix

Country	2019	Spring 2020 forecast	Summer 2020 forecast
EU 27	1.5	-7.4	-8.3
Euro area	1.3	-7.7	-8.7
Belgium	1.4	-7.2	-8.8
Germany	0.6	-6.5	-6.3
Estonia	4.3	-6.9	-7.7
Ireland	5.5	-7.9	-8.5

Country	2019	Spring 2020 forecast	Summer 2020 forecast
Greece	1.9	-9.7	-9.0
Spain	2.0	-9.4	-10.9
France	1.5	-8.2	-10.6
Italy	0.3	-9.5	-11.2
Cyprus	3.2	-7.4	-7.7
Latvia	2.2	-7.0	-7.0
Lithuania	3.9	-7.9	-7.1
Luxembourg	2.3	-5.4	-6.2
Malta	4.7	-5.8	-6.0
Netherlands	1.7	-6.8	-6.8
Austria	1.6	-5.5	-7.1
Portugal	2.2	-6.8	-9.8
Slovenia	2.4	-7.0	-7.0
Slovakia	2.4	-6.7	-9.0
Flinland	1.1	-6.3	-6.3
Bulgaria	3.4	-7.2	-7.1
Czechia	2.6	-6.2	-7.8
Denmark	2.4	-5.9	-5.2
Croatia	2.9	-9.1	-10.8
Hungary	4.9	-7.0	-7.0
Romania	4.1	-6.0	-6.0
Poland	4.1	-4.3	-4.6
Sweden	1.2	-6.1	-5.3

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Material Comfort Influence upon the Life Fulfilment during Covid-19

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Abstract

Material comfort has been an important component of human life and continues to be during our days as it influences the quality of life. But material comfort is only a component of our life, and more than this, the material comfort could be only a reflection of the other components of everyday life of each of us and of society, of the community where we are living in.

In this paper is presented an analysis of the influence of the material comfort upon the sentiment of life fulfilment. The paper also presents the analysis of the influence of age, income or gender upon the sentiment of life fulfilment. The analysis is performed using data obtained from National Institute of Statistics, the European Commission and from an experimental study on a sample of 200 persons with higher education in the South of Romania. Data were analysed using SPSS and Microsoft Excel and contain descriptive tables.

Following the analysis, it was revealed that there is a strong association between the material comfort and the sentiment of life fulfilment, but variables as gender or age have no influence upon the feeling of life fulfilment.

Keywords: Material Comfort, Life Fulfilment, Influences, Associations, Statistics.

JEL Classification: O12

1. Introduction

Covid-19 pandemic brought a massive change in the behaviour of most people in the world. Major human rights like freedom of movement, or freedom of meeting other people were affected for finding an answer to the major difficulty of the health crises.

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In Romania the State of emergency started on 17th of May, with closure of schools and universities, national movement restrictions, international movement restrictions, flight restrictions, non-essential shops closure and event stop. On May 15 the national movement restrictions were reduced marking the end of the state of emergency, and an alert state was declared. At that moment over 17,000 of persons were positive to the new coronavirus, 9,930 persons were recovered, and the number of fatalities was 1,107. The next moment important in the Covid-19 restriction in the Romanian market was 1th of June when the international and national movement restrictions were eliminated. Schools continued to be closed, non-essential shops were opened, and events were allowed but with a low number of people.

During this difficult period the different national and international measures imposed by authorities affected the life of the society, of communities and the life of each of us, as human beings.

The objectives of this paper include a presentation of the evolution of the major economic indicators for Romania in the context of European evolution and an evaluation of the influence of the material comfort upon the sentiment of life fulfilment during this period. The research starts with the analysis of macroeconomically indicators like GDP, salary evolution and consumer confidence and also provides an analysis of the data obtained through an experimental survey organised in the South of Romania, which was organised in the first week of May 2020 on 200 persons.

2. Problem Statement

Moeinaddini M. et al. (2020) analyse the factor that influences urban life satisfaction in European cities. The results show that "five main variables perform an important role in urban life satisfaction: safety in the city, satisfaction regarding healthcare services, satisfaction regarding the state of streets and buildings in the neighbourhood, satisfaction with public transport, and accessibility of retail shops". Nakamura and Managi (2020) research showed that the subjective city evaluation indicator is positively associated with the life satisfaction indicator. Coman (2019), Coman and Mihăiță (2019) analysed the influence of material comfort upon life fulfilment. The research revealed that material comfort manifests an important influence upon life fulfilment, such as the influence of the presence of art upon the feeling of life fulfilment.

Pinto et al (2017) present an analysis of the following concepts: Quality of Life, Comfort and Well-being, showing that Quality of Life is mainly characterized by the satisfaction with life generally, depending on perceptions, comfort is related to the practice of nursing in health context and well-being is used in the context of psychology.

Shin J., (2016) analyses a new theoretical framework of environmental satisfaction and human comfort, highlighting the role of human agency in the interaction between humans and environment and the context within which such interactions occur.

3. Research Questions/Aims of the research

This paper aims to present the socio-economic context generated by the Coronavirus Crisis in the Romanian society and to evaluate the influence of material comfort upon the feeling of life fulfilment during this period.

The socio-economic context will be presented taking into consideration different macroeconomic indicators. The objectives of the paper also include the evaluation of the influence of different other variables like incomes, gender or age upon the feeling of life fulfilment for having a widest image of the influence manifested by material comfort upon the feeling of life fulfilment.

4. Research Methods

The first part of the paper presents an analysis of the macroeconomic indicators using data from the National Institute of Statistics and the European Commission.

In the second part of the research an experimental study was organized, during the first week of May 2020 on a sample of 200 people in the South of Romania. The data collection was organized using TalkOnlinePanel, a company specialized in online interviews. The structure of the sample was defined using the next sampling rates: education (persons with university studies); gender: 50% men and 50% women; age: 35% of respondents with ages between 31 and 40 years, 47% with ages between 41 and 50 years and 18% others.

The material comfort, the sentiment of life fulfilment, and the presence of art are some of the factors analysed in the experimental survey.

The methods used in the research included the coefficient of association Yule and Onicescu Informational Correlation. Both indicators allow identifying the associations and the intensity of associations and were used in the social analysis.

To determine the numerical value of the Yule coefficient of association, indicating the existence and intensity of the influence, the next steps were defined. Using Microsoft Excel we constructed a table that includes the contingency table for the variables generated by the two questions analysed, plus a column with the Product of the two diagonals of the contingency table. On the line Total of this column, we included R = the ratio of the two Products. The Yule coefficient is calculated as

Q= (R-1) / (R + 1). An example of the computation for Yule Coefficient is presented in the table 1.

Table 1. Yule coefficient calculation - association between presence of art and the sentiment of life fulfilment

		Cause (Presence of Art)				
		Partial Acc. or Disagreement	**Total Agreement**	**Total**	**Diagonals' product**	**Yule Coef.**
Effect (Fulfilled Life)	**Partial Agr. or Disagr.**	128	23	151	3968	
	Total Agr.	18	31	49	414	
	Grand Total	146	54	200	9.58	81%

Source: Authors' own research

For evaluating the association

If:

Q = 0 lack of association between the two variables

Q $\rightarrow$ 0 weak association

Q $\rightarrow$ ±1 strong association

Q = ±1 perfect association

The Yule coefficient in the table 1 shows that there is a strong association between the two variables.

Going further, the Onicescu Informational Correlation Coefficient (denoted Kcor) computation is presented.

Academician Octav Onicescu (1892-1983) is one of the greatest mathematicians of Romania with a remarkable international reputation. The Informational Energy Onicescu, according to the description given by Rizescu and Avram (2014), Dragnea and Mihăiță (2017), comprises the amount of information generated by the diversity of a context. The informational energy drops proportionally with the increase in uniformity, or the strength of the influences present in the system.

The basic concept of the Onicescu information statistics is the Onicescu Informational Correlation. In order to describe the Onicescu Informational Correlation, the methodology presented by Mihăiță and Stanciu-Capotă (2005) or Oprea (2017) were used. For the computation of the Onicescu Informational Correlation we used Microsoft Excel and a table was developed, starting from the table of contingency of the two variables and including two new columns. In the first new column we included the Informational Energy of those two alternatives, on the total line of this column we included the sum of the two informational energies - representing the Informational Energy of the system.

In the second column we calculated the sum of the squares of the weights of the two segments generated by the variable effect, applied in each of the two segments generated by the variable cause.

In the first line of the column we placed the square of the weights of the segments generated by the variable effect on the first segment generated by the variable cause, and in the second the square of the weights generated by the variable effect in the second segment generated by the variable cause.

In the last line of the column (total line), we calculated the Onicescu Informational Correlation as a ratio between the Informational Energy and square root of the product of the two values in line 1 and line 2 of the same column.

Table 2. Coefficient of correlation Onicescu - association of the presence of art and the feeling of life fulfilment

		Cause (Presence of Art)				
		Partial Agr. or Disagr.	**Total Agr.**	**Total**	**Informational Energy**	**Kcor**
Effect (Fulfilled Life)	**Partial Agr. or Disagreement**	128	23	151	0.37	0.78
	Total Agr.	18	31	49	0.07	0.51
	Grand Total	146	54	200	0.44	0.70

Source: Authors' own research

The Onicescu Informational Correlation Coefficient also indicates the presence of an association between the two analysed variables.

The two computations presented above were used for analysing different associations between the variables investigated in the paper, whose results are presented further.

5. Findings

5.1. Macroeconomic Context

In January – March 2020 Romanian economic growth continued its increasing trend. Trading Economics.com shows that the 2.7% growth in the quarter for Romania was the highest economic growth amongst the EU state members, followed by Lithuania and Bulgaria. On the other hand, France, Italy and Spain registered the highest economic decline.

The GDP evolution in January – March 2020 is only impacted towards the end of March when the lockdown was in place and social distancing required. The measures taken by the government also impacted the manufacturing industry, their activity being limited during the lockdown and the production index plunging to -14.5 at the end of April. The Retail has also just started to reflect the measures starting with March; the turnover dropped more on Do It Yourself and Non-food retail but started to get back on track in May.

For Romanian businesses, once with the state of emergency, the government put in place a bonusing system of 5% tax reduction for large businesses and 10% for small and medium businesses if taxes were paid during a given period. Besides this, other measures of relaxation were taken, in order to stimulate the local businesses during the pandemic. The political tensions started to decrease once with the shifting of attention towards the global pandemic and the pressure on improving the safety measures for the population culminating with the state of emergency starting with 16th of March 2020. Improvements in population's confidence and optimism started to show after 15th of May when the state of emergency was removed. Towards the end of Q1 we start to notice an unstable labour market in which the unemployment rate started to grow after the imposition of social distancing ruling that limits manual labour, industrial manufacturing and traditional retail. Unemployment rate peaks at 5.2% registering constant growth since March. Beside this, the food inflation takes a leap going up to 5.7% in April and slightly lower in May (5.25%). The rush for household stocks towards the end of March when the state of emergency was announced and installed impacted the prices too. All these put a pressure on the Romanian consumers' purchasing power.

On the 1st of April over 1 mil. employees entered in technical unemployment or terminated their working contract due to pandemic eruption. Unemployment issues are expected to be present during the following months too as many companies are still working at lower capacity and some restrictions are still in place even after the state of emergency.

According to the European Commission, the consumer confidence indicator registered an increasing trend during last years, reaching a value higher than the European average in December 2019. In the first months of 2020, the consumer confidence indicator began its decreasing trend. Romanians' confidence index went below the EU average in Q1 starting to decrease more in March 2020 and taking a plunge in April once the state of emergency was in place. The lower optimism is present across EU state members, jobs being threatened and household financial stability being at stake. Romanians' confidence is just in line with the EU average under the same pressure driven by the newly announced measures and pandemic evolution. In May the EU confidence index average went up slightly, consumers from most of the countries starting to be more optimistic.

The macroeconomic indicators presented reflect the impact of Covid-19 crisis in the Romanian economy. These different macroeconomic indicators quantify the context which affects the material comfort of the population. The evolution of the Consumer Confidence indicator in Romania and in Europe reflects the feeling of confidence of the population.

For having a deeper image of the impact of material comfort upon the feeling of life fulfilment, an analysis of data obtained in the experimental survey organised in the South of Romania in first week of May will be presented.

5.2. The influence of material comfort upon the feeling of life fulfilment

In order to evaluate the influence of material comfort upon the sentiment of life fulfilment we analysed the association between the answers received for the question regarding material confront and the question regarding the sentiment of life fulfilment. The association between the two variables generated by these questions were analysed using the coefficient of association Yule and the Onicescu Informational Correlation.

Yule coefficient calculated for this association (0.91) shows that there is a strong association between the two variables. The Onicescu Informational Correlation Coefficient (0.66) also indicates the presence of an association between the two analysed variables. Both coefficients indicate that material comfort manifests a strong influence upon the feeling of fulfilment in life.

The research also evaluated the influence of the presence of art upon the feeling of life fulfilment, and the Onicescu Informational Correlation and Yule Coefficient show that the two variables are in a moderate association.

A synthesis of the values calculated for Yule Coefficient and the Onicescu Informational Correlation for the variables analysed in association with the feeling of life fulfilment is presented in the table 3.

Table 3. The Onicescu informational correlation and Yule coefficient calculated for life fulfilment

Cause / Effect	Onicescu Informational Correlation	Yule Coefficient
Material Comfort / Fulfilled Life	66%	91%
Art Presence / Fulfilled Life	84%	65%
Income / Fulfilled Life	92%	43%
Age / Life fulfilled	98%	-34%
Gender / Fulfilled Life	100%	5%

Source: Authors' own research

The results of the analysis show that Income, Age and Gender do not manifest influence upon the feeling of life fulfilment. The strongest association is manifested between Material Comfort and the Feeling of Life fulfilment.

The research also includes the evaluation of the influence manifested by Gender, Age and Income upon Material Comfort. The results are presented in the table 4.

Table 4. The Onicescu Informational Correlation and Yule Coefficient calculated for Material Comfort associations

Cause / Effect	Onicescu Informational Correlation	Yule Coefficient
Income / Material Comfort	95%	56%
Age / Material Comfort	99%	-15%
Gender / Material comfort	100%	4%

Source: Authors' own research

The research revealed that income has a small influence upon the material comfort, and Age and Gender doesn't have influence upon the material comfort.

Analysing the associations presented, the stronger association that resulted was the influence of material comfort upon the life fulfilment. An important aspect is that income does not influence the feeling of fulfilment in life, although income influences material comfort. The difference between the perception of material comfort and income level is generated by the broad context that defines the life of each of us.

5.3. The influence of Material Comfort upon the feeling of life fulfilment

For a deeper analysis, several control variables were used. These variables were applied for segmenting the population and evaluating how the associations manifest themselves within the segments.

The control variables used and the segments generated by their application are: Age, 44% of respondents are younger than 40 years old, and 56 are older than 40 years old; Education, 71% of respondents have graduated higher education, and 29% of respondents have graduated post university education and Gender, 50% of respondents are women, and 50% are men.

Table 5. The Onicescu informational correlation and Yule coefficient calculated for association between material comfort and sentiment of life fulfilment

Cause (Material Comfort)/ Effect (Fulfilled Life)	Onicescu Informational Correlation	Yule Coefficient
Total	0.66	0.91
<40 years old	**0.62**	**0.97**
>40 years old	0.69	0.86
Postgraduate studies	**0.39**	**0.97**
University studies	0.72	0.89
Men	0.67	0.88
Women	**0.64**	**0.95**

Source: Authors' own research

Analysing the values registered by the two coefficients, it was observed that material comfort has a greater influence on the feeling of fulfilment in life in the case of people under 40. If the influence of the presence of art on the feeling of fulfilment in life is less pronounced in the case of people over the age of 40, material comfort has a greater impact among younger people.

Among those with postgraduate studies, we also found a stronger association between the feeling of fulfilment in life and material comfort. In the same segment, the influence of the presence of art was also stronger comparing with the association manifested for the segment of respondents with university studies.

Women are another segment where material comfort has had a strong influence on the feeling of fulfilment in life, compared to men. There was also a stronger influence of the presence of art among women compared to men.

The influence is present in all segments, and these results prove that the influence of material comfort upon life fulfilment is a strong influence.

6. Conclusions

The crisis period generated by Covid-19 brought changes on the economic and social level both in Romania and in Europe. It has led to increased unemployment, decreased consumer confidence, while lowering political tensions and several government measures supporting the economies. Analysing the influence of material comfort on the feeling of fulfilment in life in this period marked by uncertainty, it was found that material comfort continues to have a strong influence upon the feeling of fulfilment in life. An important aspect is that income does not show influence on the feeling of fulfilment in life, although it influences material comfort. The difference between the perception regarding the material comfort and income is generated by the context that defines the life of each of us. Within the population segments, it was observed that material comfort has a stronger influence on people under the age of 40, among people with postgraduate studies and among women. Material comfort continues to be one of the strongest factors influencing the feeling of fulfilment in life.

References

[1] Coman, I., Mihăiță, N. (2019). Factors influencing the impact of art on life satisfaction in the population with higher education in Southern Romania. 8th *International Conference Synergies In Communication*. SiC 2019, pp. 39-49.

[2] Coman, I. (2019). Life Fulfilment Influence on Art Consumption and Convictions Regarding Art. Proceedings Of The 13th *International Management Conference "Management Strategies for High Performance"*, pp. 1198-1205.

[3] Dragnea, M., & Mihăiță, N. (2017). Customer Retention Strategies and Organizational Adaptability, *VISION 2020: Sustainable Economic Development, Innovation Management, and Global Growth*, VOLS I-IX, Edited by: Soliman, K. S., pp. 1291-1299.

[4] European Commission: https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/business-and-consumer-surveys/download-business-and-consumer-survey-data/press-releases_en.

[5] Nakamura, H., Managi, S. (2020). Effects of subjective and objective city evaluation on life satisfaction in Japan, Journal of Cleaner Production, 256, pp. 1-9.

[6] Mihăiță, N., Stanciu-Capotă, R., (2005). Relations statistiques fortes, cachees, fausses, et illusories *Applications de la statistique informationelle*. Bucharest: ASE.

[7] Moeinaddini, M., Asadi-Shekari, Z., Aghaabbasi, M., Saadi, I., ZalyShah, M., Cools, M. (2020). Applying non-parametric models to explore urban life satisfaction in European cities. *Cities*. 105, pp. 1-12.

[8] Oprea, M. (2017). An Overview on the Contributions of the Academician Octav Onicescu to the Informational Statistics and Further Developments. *The 12th International Conference on Virtual Learning: Virtual Learning – Virtual Reality*, pp. 54-63.

[9] Pinto, S, Fumincelli, L., Mazzo, A., Caldeira, S., CarlosMartins, S. (2017). Comfort, well-being and quality of life: Discussion of the differences and similarities among the concepts. *Porto Biomedical Journal*. 2(1), pp. 6-12.

[10] Rizescu, D., Avram, A. (2014). Using Onicescu's Informational Energy to Approximate Social Entropy, *Procedia - Social and Behavioral Sciences*, 114, pp. 377-381.

[11] Shin, J. (2016). Toward a theory of environmental satisfaction and human comfort: A process-oriented and contextually sensitive theoretical framework. *Journal of Environmental Psychology*. 45, pp. 11-21.

[12] Trading Economics.com.: https://tradingeconomics.com/romania/remittances.

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Clustering and Multiple Regression Analysis of the Renewable Energy Sector in the OECD Countries

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Abstract

The use of energy from renewable sources has many potential benefits, including a reduction in greenhouse gas emissions, diversification of energy supply and reduction of dependence on fossil fuel markets (in particular, on the oil and gas market). The development of renewable energy sources can also influence employment by creating jobs in the new "green" technologies sector. The aim of our research was to identify the main factors influencing renewable energy consumption in OECD countries during 2017-2018. We applied data mining techniques to reduce data dimensionality and developed our research by using Clustering Analysis and Multiple Regression Analysis. We analysed the relationship between GDP per capita and primary energy supply. We considered primary energy supply as the dependent variable and the first three factor scores retained when we applied principal component analysis, as the independent variables, as well as GDP per capita. By applying the K-means algorithm we obtained 5 clusters, having USA and Canada as outliers. The compactness of the clustering, namely the similarity of the objects in the same group is of 68.5%. Applying multiple regression analysis, we obtain that 51% of the variation in primary energy supply can be explained by the three factors and GDP per capita. The results of our research show that renewable energy is an extremely valuable resource with a significant influence on GDP. States that have coherent energy policies for the use of renewable energy resources have already made major changes in their economic models to achieve sustainable development.

Keywords: renewable energy, clusters, regression.

JEL Classification: Q2, Q4, Q5

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1. Introduction

In the last decades, the interest in renewable energies has increased rapidly. One of the reasons is that environmental issues have become increasingly visible on the political agenda (Dan, 2019) and capital investment can provide the necessary impetus to reduce environmental degradation (Mesagan & Olunkwa, 2020). A significant increase in investments for the capitalization of the renewable energies can be observed. Although the conventional energy system considers renewable energy sources as alternative sources, we are actually talking about sources that, in one form or another, have been used by humanity for thousands of years - compared to fossil fuels, for which the technology of exploitation has developed only in the last 150-200 years. According to the IEA (International Energy Agency, 2019), world energy production has increased almost 4 times in the last 50 years, from about 6,000 TWh to almost 24,000 TWh. As one terawatt-hour is one billion kilowatt-hours, it means that humanity consumes in a year the amount of energy needed to operate about 70 billion refrigerators (Benda-Prokeinová et al., 2017). Considering that a western household consumes an average of 3,000 kWh/year, the total energy produced would meet the needs of 8 billion families.

At the level of large companies, investments in renewable energy are gigantic but face many administrative-bureaucratic problems. In recent years, a new concept has emerged, that of "energy citizens", who show much greater flexibility and have the ability to create a much more efficient energy distribution/storage network than in the case of large utility companies. "Energy citizens" can be both individuals and small businesses or even family communities. Experts estimate that in 2050, the network of "energy citizens" could produce over 600 TWh of solar panels, respectively over 900 TWh due to wind turbines. Interestingly, the most important contribution in the solar field would be to households (with almost three-quarters of energy production), while two-thirds of wind energy would be provided by SMEs (Tvaronavičienė et al., Kasperowicz et al., 2017). Energy security, the competitiveness of energy and economic markets, together with ecological and climate sustainability is the fundamental strategic objectives of the strategy of any responsible government.

Our research shows the renewable energy potential of the OECD countries and their impact on economic development. Five clusters were identified on these coordinates and we analysed their structure and the influences thereof on the economic development of the OECD states.

2. Problem Statement

Renewable energies mean all those types of energy sources that do not pollute or have an extremely small impact on the environment or the health of living things, being, at the same time, sources which regenerate due to natural processes or are inexhaustible (from the temporal perspective of people life). The main sources of renewable energy are wind (due to air currents and winds), solar (which captures and transforms solar energy into electricity and heat), various types of water energy

(hydraulics – the energy of running water; tides − energy obtained from the flow / reflux of seas and oceans; osmotic − wave energy), geothermal (energy gained from the deep heat of the Earth) or energy obtained from biomass (fuels obtained from the processing of plants or wood mass). The transition from fossil fuel to renewable fuel units is also an economic necessity, not just a climate one. Some fossil fuel production units in Europe have costs even below 50-60 EUR/MWh. Renewables are already the second-largest source of electricity globally, but their use must be accelerated in order to meet long-term climate goals. As costs continue to fall, more and more subsidies are being given for their use of photo-voltaic panels.

In 2020 the 2019 report EY − Renewable Energy Country Attractiveness Index (RECAI) based on a study on renewable energies was published. The report (Report EY, 2020) highlights that climate change and environmental, social and governance issues are gaining increasing recognition as key factors in developing a company's potential and creating value (Çera et al., 2019). Institutional investors not only expect high-performing financial results from companies, but also demonstrate that they have a positive contribution to society. An increased number of organizations are interested by new technologies in order to reduce their emissions, improve their management system and improve the climate factors. In this context, the keys priorities of the OECD are green organizational behaviour renewable energy and so on (Ik, & Azeez, 2020; Vu & Ngo, 2019). The OECD governments increased the investments funds to develop renewable energy infrastructure as a means of hedging climate change risks. (Tishkov et al., 2020; Dudin et al., 2019; Sarma et al, 2019)

In 2020, for the first time since 2016, the U.S.A. ranks first due to a short-term expansion of the fiscal credit program for the production and long-term development of the offshore wind segment, with investments of $ 57 billion planned to install a capacity of up to 30 GW by 2030. China's growth in the renewable energy sector has slowed down, amid the authorities' intentions to phase out subsidies in order to create a more competitive market (Kuncoro, 2019). France has moved from fourth to third place, securing a strong position on energy prices and allocating 1.4 GW capacity to developers in the wind and solar energy segments, in order to eliminate gradually the dependence of its network on nuclear energy. The United Kingdom, ranked sixth, made a reference proposal to include offshore wind and solar projects in the next tender for difference contracts encouraging greater and more diverse development of the renewable energy sector. Spain rose four places to 11th, despite being severely affected by COVID-19, given that energy and climate policy remains a priority for the new government coalition. It has proposed aggressive but realistic plans to develop the wind and solar energy segment, and most investors remain optimistic about Spain's medium-term outlook.

In recent years, many multinational organizations have tried to diversify their energy sources, have begun to invest more in renewable energy sources and thus drive their development (Žižka & Pelloneová, 2019; Ślusarczyk & Ul Haque, 2019). Tax deductions, reduced fixed costs with bills, but also the opportunity to position themselves as companies trying to protect the environment have convinced many businesses to invest in sustainable energy. While at the beginning solar or wind

energy worked intermittently, constant investments in such technologies have led to improved equipment and storage methods, so that these types of green energy have become as safe as traditional ones. In addition, the diversification of forms of renewable energy equalled to the emergence of new opportunities for large businesses to streamline their costs.

In the last year, US multinationals have invested record amounts in solar energy, investments that have reduced carbon dioxide emissions by 2.4 million tonnes. Companies such as Apple, IKEA, Amazon, Walmart or Target have equipped their factories with non-pressurized solar panels and classic solar panels to reduce their production costs and their footprint. But these are not the only ways in which big business benefits from the adoption of renewable energy sources.

Companies that still use traditional energy sources have costs that fluctuate from month to month, but also costs that are rising from year to year. Traditional energy sources have variable prices that rise exponentially. Instead, renewable energy sources have fixed costs: an initial investment, then minimum maintenance costs. And the investment pays off quickly. For example, in case of non-pressurized solar panels, used mainly for water heating, the installation can be done in just a few hours, and the costs are amortized in 2-3 years and in order to encourage companies to give up traditional energy in favour of renewable energy, many states offer some tax exemptions or subsidize some of the costs. This automatically means lower investment costs for businesses or a much better return on investment. Depending on the size of the company, the savings can amount to thousands or even hundreds of thousands of euro (Nevado Gil et al., 2020; Kasperowicz et al., 2017). Our research highlights the influence that renewable energy has on the OECD economic and social development (Duľová Spišáková et al., 2017). Thus, the main research variables were analysed and several correlations were found. We find out that the renewable energy will contribute significantly to the sustainable economic development of the OECD countries.

3. Aims of the research

The aim of our research was to identify the main characteristics of the renewable energy sector in OECD countries during 2017-2018 by using Cluster analyses. The K-Means cluster analysis led to 5 clusters, three of them being single-element clusters: USA, New Zealand and Lithuania. Another objective of our research was to find out and to explain the relationships between GDP per capita and specific variables and factors by using a linear regression model. We chose 13 indicators for 2017-2018 extracted from various databases: OECD, Our World in Data, International Energy Agency (IEA) and International Renewable Energy Agency (Irena). We shall enumerate as follows the 13 indicators: Primary energy supply (toe 1000USD)(V1), Electricity generation (Gigawatt-hours) (V2), Renewable energy (Ktoe) (V3), Traditional biofuels (terrawatt-hours) (V4), Hydropower (terrawatt-hours) (V5), Solar (terrawatt-hours) (V6), Wind and other renewables (terrawatt-hours)(V7), Energy production (ktoe) (V8), Energy imports (ktoe) (V9), Energy

exports (ktoe) (V10), Energy capacity (MW) (V11), Energy generation (GWh) (V12) and Nominal GDP per capita (USD) (V13).

4. Research Methods

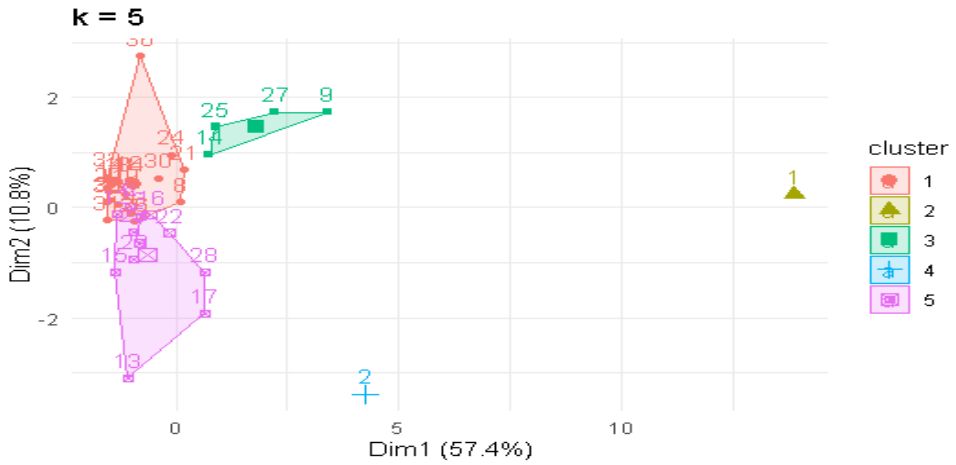
Using the R environment, we applied the k-means clustering (MacQueen, 1967) and we decided that the most appropriate number of clusters is k = 5. K-means algorithm is an iterative clustering algorithm that partitions the data into a number of predefined clusters denoted by K. The purpose of K-means algorithm is to have homogeneous objects in a cluster, such that the within cluster variation is minimized. The main steps of the K-means algorithm are:

- The number of clusters denoted by K is specified.
- The centroids are randomly initialized from the objects of the dataset.
- The objects are assigned to the closest cluster.
- The centroid of each cluster is determined by computing the average of all objects that belong to each cluster.

5. Findings

The OECD countries have been grouped in 5 clusters as in the following figure 1:

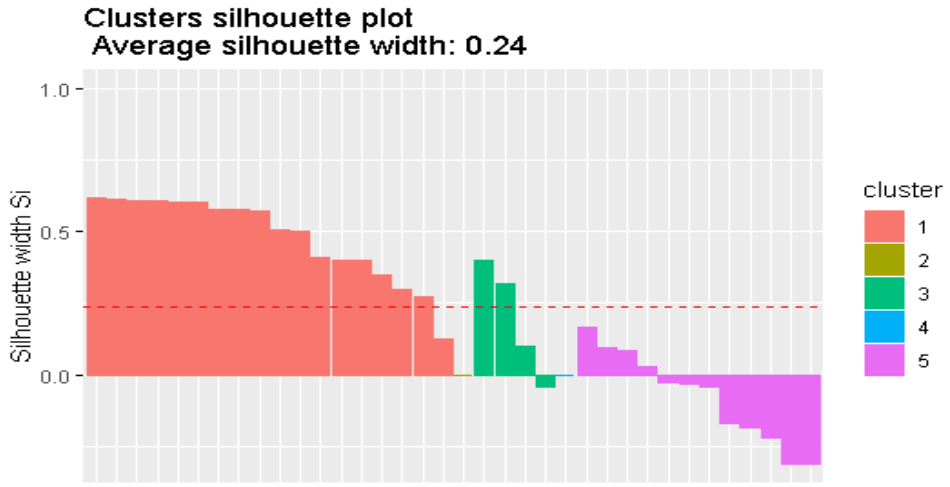
Figure 1. Cluster plot



Source: Authors

The cluster distribution is: 18, 1, 4 ,1, 12. The compactness of the clustering, i.e. the similarity of the objects in the same group is 68.5%. The quality of the clustering is measured by the average silhouette approach. It measures how well the objects are assigned to clusters and also the separation between clusters. The silhouette plot in figure 2 indicates how close an object in a cluster is or may be situated in the neighbouring clusters.

Figure 2. Silhouette plot



Source: Authors

The silhouette coefficient (Rousseeuw, 1987) takes values from -1 to 1. There are three situations: (1) If the silhouette coefficient is close to 1, then the object is located far away from the neighbouring clusters; (2) If the silhouette coefficient is close to -1, then the object could have been assigned to neighbouring clusters; (3) If the silhouette coefficient is around 0, then the object is located on the border of the neighbouring clusters. In our case the average silhouette width is 0.24, meaning that overall the cluster structure is artificial, due to single-element clusters 2 (USA) and 4 (Canada), the cluster silhouettes of which are 0.

The structure of the clusters is as follows:

Cluster 1: Belgium, Czech Republic, France, Greece, Hungary, Poland, Portugal, Slovak Republic, Spain, Turkey, South Korea, Mexico, Estonia, Latvia, Slovenia, Chile, Israel and Lithuania;

Cluster 2: USA;

Cluster 3: Germany, Italy, United Kingdom, Japan;

Cluster 4: Canada;

Cluster 5: Austria, Denmark, Finland, Ireland, Iceland, Luxembourg, Netherlands, Norway, Sweden, Switzerland, Australia, New Zealand.

17.4% of Canada's energy supply came from renewables, such as hydro power, wind power, solar power and biomass 3% of the global renewable energy production comes from Canada (Government of Canada, 2020), and 9% from USA, these statistics placing the two countries on the seventh place, and third place, respectively, in a ranking dominated by China and India.

Cluster 3 is dominated by Germany and Japan. According to Renewable Energy Sources and Figures for 2018 (Renewable Energy Sources and Figures, 2018), in the last years, in Germany, the share of renewables in energy consumption grew from

6% in 2000 to 33% in 2017 and 38% in 2018. In Germany in 2017 the most important renewables were reported as: wind power (16.3%), biomass (6.9%), photostatic and geothermal energy (6.1%), followed by hydro power (3.1%). According to the Japanese Institute for Sustainable Energy Policy (Institute for Sustainable Energy Policy. Share of Renewable Energy Power in Japan, 2018) in 2018, the share of renewable energy to demand was 16.5%; in the total power generation, the solar PV power generation was 6.5%, the share of variable renewable energy (solar PV and wind) was 7.2%, while hydro power and geothermal power remained constant in the electricity generation.

In Cluster 5, we remark Iceland, Sweden and Denmark, which, according to Click Energy (Click Energy, 2017), ranked in a top of 12 world countries generating most of energy from renewables. Iceland ranks first, producing 100% energy from geothermal and hydro power plants. Sweden ranks second, and Denmark eighth. In 2017, Denmark generated electricity enough for 10 million average EU households, only from wind power.

In Cluster 1, Latvia, Portugal, Lithuania and Slovenia occupy top positions, intercalated with some countries from cluster 5, Sweden, Finland, Denmark, Austria in Eurostat 2018 statistics regarding the share of energy from renewable sources expressed as percent of gross final energy consumption.

6. A Multiple Regression Analysis Model

In this section we used the Principal Component Analysis results from the paper (Androniceanu A-M et al., 2020) and retain the score factor matrix**.** We followed Zhang et al. methodology (Zhang et al., 2012). An analysis of energy goes in hand with GDP per capita. We intend to discover the effect of GDP per capita on primary energy supply. We consider primary energy supply (V1) as the dependent variable and the first three factor scores F1, F2, F3 as the independent variables, as well as (V13) GDP per capita.

The original variables and the factor scores F1, F2, F3 will be standardized according to the formula:

$$x' = \frac{x - m}{\sigma^2} \tag{1}$$

where x' denotes the standardized data, x denotes the original data (V13, F1, F2, F3, V1), m is the mean and σ is the standard deviation of the original data.

We apply OLS to estimate the parameters a, b, c, d and e in equation (2):

$$V_1' = aV_{13}' + bF1' + cF2' + dF3' + e \tag{2}$$

where by $V_1', V_{13}', F1', F2', F3'$ we denoted the standardized indicators.

Table 1. Multiple regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
V13	-361.6254	206.1550	-1.754143	0.0893
F1	0.017795	0.018509	0.961394	0.3438
F2	-0.047545	0.009423	-5.045462	0.0000
F3	0.009307	0.007367	1.263246	0.2159
C	0.102139	0.006412	15.92959	0.0000
R-squared	0.510829	Mean dependent var		0.102139
Adjusted R-squared	0.447710	S.D. dependent var		0.051767
S.E. of regression	0.038471	Akaike info criterion		-3.549559
Sum squared resid	0.045881	Schwarz criterion		-3.329625
Log likelihood	68.89205	Hannan-Quinn criter.		-3.472796
F-statistic	8.093133	Durbin-Watson stat		2.096581
Prob(F-statistic)	0.000137			

Source: Authors

The regression line is:

$$V_1' = 0.1021 - 361.62V_{13}' + 0.01777F1' - 0.0475F2' + 0.0093F3' \quad (3)$$

Equation (3) shows that when the GDP per capita raises by one unit, the dependent variable primary energy supply decreases by 361.62 units. The adjusted R-square statistic is equal to 0.44, indicating a moderate fit. R-squared equals 0.51, which means that 51% of the variation in primary energy supply is explained by the independent variables F1, F2, F3 and GDP per capita.

7. Conclusions

The results of cluster analysis showed that Canada and USA are single elements clusters, due to their top positions in generating electricity mainly from renewables and the investments in carbon-free energy sources.

The results of our research show that massive investments will be needed in the field of renewable energy in order to modernize, expand and decentralize the networks for the production, storage, transport and distribution of renewable energy to make them more robust and resilient. Innovation plays a key role in this transition process. The newest flexible gas turbines and engines already convert natural gas into electricity at low costs and allow operators to introduce intermittent renewable energy such as solar or wind energy into the mix. Big Data and the industrial Internet will also facilitate the efficiency of energy utilities. Our research shows that renewable energy helps build and exist modern economies and is essential for everyday life on the planet.

References

[1] Androniceanu, A.-M., Georgescu, I., Tvaronavičiene, M., & Androniceanu, A. (2020). Canonical correlation analysis and a new composite index on digitalization and labour force in the context of the industrial revolution 4.0. *Sustainability*, 12(17), September, Article number: 6812.

[2] Benda-Prokeinová, R., Dobeš, K., Mura, L., Buleca, J. (2017). Engel's Approach as a tool for estimating consumer behaviour. *E+M Ekonomie a Management*, 20(2), pp. 15-29. DOI: 10.15240/tul/001/2017-2-002.

[3] Çera, G., Meço, M., Çera, E., Maloku, S. (2019). The effect of institutional constraints and business network on trust in government: an institutional perspective. *Administrație și Management Public*, 33, pp. 6-19, DOI: 10.24818/amp/2019.33-01.

[4] Click Energy (2020). *12 Countries Leading the Way in Renewable Energy*. Blog Post, Thursday 10 August 2017. Retrieved from: https://www.clickenergy.com.au/news-blog/12-countries-leading-the-way-in-renewable-energy/. Accessed on 17 July 2020.

[5] Dan, H. (2019). Culturally green – an investigation into the cultural determinants of environmental performance, *Forum Scientiae Oeconomia*, 7(2), pp. 107-126. DOI: 10.23762/FSO_VOL7_NO2_7.

[6] Dudin, M. N., Frolova, E. E., Protopopova, O. V., Mamedov, A. A., Odintsov, S. V. (2019). Study of innovative technologies in the energy industry: nontraditional and renewable energy sources, *Entrepreneurship and Sustainability Issues* 6(4), pp. 1704-1713. http://doi.org/10.9770/jesi.2019.6.4(11).

[7] Duľová Spišáková, E., Mura, L., Gontkovičová, B., Hajduová, Z. (2017). R&D in the context of Europe 2020 in selected countries. *Economic Computation and Economic Cybernetics Studies and Research*, 51(4), pp. 243-261.

[8] Government of Canada. (2020). *Renewable Energy Facts*. Retrieved from: https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/renewable-energy-facts/20069. Accessed on 18 July 2020.

[9] Ik, M., & Azeez, A. A. (2020). Organisational green behavioural change: The role of Change Management. *International Journal of Entrepreneurial Knowledge*, 8(1), pp. 34-48.

[10] Institute for Sustainable Energy Policy (2018). *Share of Renewable Energy Power in Japan*. Retrieved from: https://www.isep.or.jp/en/717/. Accessed on 28 July 2020.

[11] International Energy Agency (2019). *Key world energy statistics*. Retrieved from: https://www.iea.org/reports/key-world-energy-statistics-2019, Accessed on 19 July 2020. [2] Mesagan, E.P., & Olunkwa, N. C. (2020). Energy consumption, capital investment and environmental degradation: the African experience, *Forum Scientiae Oeconomia*, 8(1), 5-16. DOI: 10.23762/FSO_VOL8_NO1_1.

[12] Kasperowicz, R., Pinczyński, M., & Khabdullin, A. (2017). Modelling the power of renewable energy sources in the context of classical electricity system transformation. *Journal of International Studies*, 10(3), 264-272. DOI:10.14254/2071-8330.2017/10-3/19

[13] Kuncoro, H. (2019). Tax counterbalancing in developing countries the case of Indonesia. *Administrație și Management Public*, 32, pp. 77-92, DOI: 10.24818/amp/2019.32-06.

[14] MacQueen, J. B. (1967). Some methods for classification and analysis of multivariate observations. In *Proceedings of the 5th Berkeley Suymposium on Mathematical Stantistics and Probability* (2nd ed.). Berkeley, University of California Press, pp. 281-297.

[15] Mesagan, E. P., & Olunkwa, N. C. (2020). Energy consumption, capital investment and environmental degradation: the African experience, *Forum Scientiae Oeconomia*, 8(1), pp. 5-16. DOI: 10.23762/FSO_VOL8_NO1_1.

[16] Nevado Gil, M. T., Carvalho, L., & Paiva, I. (2020). Determining factors in becoming a sustainable smart city: An empirical study in Europe. *Economics and Sociology*, 13(1), pp. 24-39. DOI:10.14254/2071-789X.2020/13-1/2.

[17] Renewable Energy Sources and Figures. National and International Development. (2018). Available at https://www.bmwi.de/Redaktion/EN/ Publikationen/renewable-energy-sources-in-figures-2018.html. Accessed on 24 July 2020.

[18] Report EY (2020). Renewable Energy Country Attractiveness Index (RECAI). Retrieved from: https://www.ey.com/en_uk/recai. Accessed on 21 July 2020.

[19] Rousseeuw, P. J. (1987). Silhouettes: a graphical aid to the interpretation and validation of cluster analysis. *Journal of Computational and Applied Mathematics*, 20, pp. 53-65.

[20] Sarma, U., Karnitis, G., Zuters, J., & Karnitis, E. (2019). District heating networks: enhancement of the efficiency, *Insights into Regional Development*, 1(3), pp. 200-213. https://doi.org/10.9770/ird.2019.1.3(2).

[21] Ślusarczyk, B., Ul Haque, A. (2019). Public services for business environment: challenges for implementing Industry 4.0 in Polish and Canadian logistic enterprises. *Administrație și Management Public*, 33, pp. 57-76, DOI: 10.24818/amp/2019.33-04.

[22] Tishkov, S., Shcherbak, A., Karginova-Gubinova, V., Volkov, A., Tleppayev, A., Pakhomova, A. (2020). Assessment the role of renewable energy in socio-economic development of rural and Arctic regions. *Entrepreneurship and Sustainability Issues*, 7(4), pp. 3354-3368. http://doi.org/10.9770/jesi.2020.7.4(51).

[23] Tvaronavičienė, M., Prakapienė, D., Garškaitė-Milvydienė, K., Prakapas, R., Nawrot, Ł. (2018). Energy Efficiency in the Long-Run in the Selected European Countries. *Economics and Sociology*, 11(1), pp. 245-254. DOI:10.14254/2071-789X.2018/11-1/16.

[24] Vu, H. M., Ngo, V. M. (2019). Strategy development from triangulated viewpoints for a fast growing destination toward sustainable tourism development – a case of Phu Quoc Islands in Vietnam, *Journal of Tourism and Services*, 10(18), pp. 117-140.

[25] Zhang, J., Yang, X.-Y., Shen, F., Li, Y.-W., Xiao, H., Qi, H., Peng, H., & Deng, S.-H. (2012). Principal component analysis of electricity consumption in China. *Energy Procedia*, 16(C), pp. 1913-1918.

[26] Žižka, M., Pelloneová, N. (2019). Do clusters with public support perform better? Case study of Czech cluster organizations. *Administrație și Management Public*, 33, pp. 20-33, DOI: 10.24818/amp/2019.33-02.

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Multifactorial Components Analysis of the Renewable Energy Sector in the OECD countries

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Abstract

New technologies and new market realities determine the global energy industry to redesign their business models in all significant areas. We based our research on the components of renewable energy within the OECD countries and used thirteen indicators in order to find out both the relations and the impact of main sectorial indicators and the global indicators of the OECD countries to their economic and social development. The main goal of our research is to discover the main correlations between the renewable energies and the economic development of the OECD countries. We used databases of the OECD, Our World in Data, International Energy Agency (IEA) and International Renewable Energy Agency (IRENA), available for years 2017 and 2018. We apply Principal Component Analysis (PCA) and retain three principal components explaining 76.098% of the total variance. The main findings of the PCA application are; (1) factor 1 is dominated by the main renewable energy sources: traditional biofuels, hydropower, solar, wind and other renewables, as well as energy products, energy exports, energy capacity and energy generation; (2) factor 2 is dominated positively by energy imports and negatively by primary energy supply and GDP per capita; (3) factor 3 measures electricity generation. The results are addressed to the OECD member states, but also to other categories of states. Our results clearly show whetherthe OECD states are developing coherent renewable energy policies as part of an integrated smart energy system. The results show a direct link between investments in renewable energy and macroeconomic indicators of the considered states.

Keywords: renewable energy, principal component analysis, governmental policy.

JEL Classification: Q2, Q4, Q5

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1. Introduction

In the last couple of decades, environmental issues have become increasingly visible on the political agenda and have galvanised civil and political powers into action (Dan, 2019). The role of renewable energy is especially underlined. Renewable energy is a viable and sustainable alternative to fossil fuels energy for several reasons: it is inexhaustible, has a minimal effect on the environment, does not emit greenhouse gases and does not produce waste, enables a decentralized energy production adapted to the local resources and needs and offers important energy independence (Adamisin et al., 2018). In recent years, global energy consumption is growing much faster than the population. Thus, if five decades ago, at a population of 3.7 billion people, the energy consumption was of 5 billion tons of oil equivalent, by 2020 it is estimated that it will reach 8 billion people, and the energy consumption will reach 19 billion tons of oil equivalent. By 2040, there will be about 9 billion people on the planet, and consumption will be more than 6 times higher (32 billion tons) than 50 years ago. Between 2060 and 2065, the global population will reach 10 billion people, and energy consumption will continue to grow.

The pressure generated by increased demand and concern about climate change will have an impact on all segments of the energy, utilities, and resources industries (Zhang et al., 2016). The energy sector is at the centre of massive transformations (Droes & Koster, 2020). The growing demand for energy, associated with the decline of oil, gas and coal resources, is driving up prices for conventional energy (Sabishchenko et al., Haseeb et al., 2020). Governments around the world have responded by setting goals for generating "clean" energy and by encouraging and providing incentives for new forms of energy from renewable sources. (Dudin et al., 2019; Chehabeddine & Tvaronavičienė, 2020; El Idrissi et al., 2020; Mikhaylov et al., 2020). Investors and financial institutions should be able to accurately determine the return and return on their investments. Research shows that capital investment can provide the necessary impetus to reduce environmental degradation (Mesagan & Olunkwa, 2020). In this complex international context, the OECD plays an important role by promoting structural reforms through a social agenda focused on combating inequalities and sustainable development. The keys priorities of the OECD are the green growth indicators (Kelić et al., 2020) sustainable tourism development (Vu & Ngo, 2019) renewable energy, transportation, and many others. For more than fifty years, the OECD has been an internationally recognized authority in the field of analysis, recommendations, comparative data and economic and social statistics (Duľová Spišáková et al., 2017). The 36 members of the OECD (of which most Europeans - 24) are developed states, holding over 70% of global production and trade and 90% of the global foreign direct investment (Tkachuk & Vinnychuk, 2020).

The main goal of our research is to apply data mining techniques to reduce data dimensionality such as a main component analysis in order to find the main factors influencing (Al-Tkhayneh et al., 2019) the renewable energy consumption in OECD states during 2017-2018, such as primary energy supply,

energy generation, nominal GDP per capita, energy production, energy capacity and some others (Çera et al. 2019; Žižka & Pelloneová, 2019). One of the purposes of this paper is to analyse the relationship between GDP per capita and primary energy supply.

2. Problem Statement

The Millennium Report on Ecosystems, which groups 1400 scientists within the UN, concluded that 60% of ecosystems are degraded or used in a non-renewable way. Climate change is the biggest threat to the preservation of a habitable planet.

Recent analyses carried out by the International Energy Agency (IEA) show that CO2 emissions have stagnated globally for the second consecutive year, while the global economy has grown by more than 3%. Preliminary IEA data suggests that electricity generated from renewable energy has played a critical role, accounting for about 90% of total new energy generated in 2015 (Androniceanu & Tvaronavičienė, 2019). This new decoupling trend is found in 21 states that have succeeded in reducing gas emissions by greenhouse effect simultaneously with the growth of the gross domestic product. 16 of the respective countries are the Member States in the European Union, including Romania. Renewable energy includes hydro, geothermal, wind, solar, tide and wave sources, energy derived from solid biofuels, bio gasoline, bio diesels, and so on. Renewable energy production has been dominated by biomass: wood burning and agricultural waste biomass. In 2014, renewables reached an estimated 1.7 TW (double than that of 10 years ago), and the percentage in the overall capacity of electricity generation increased to almost 23%. It is remarkable how developments in "new" renewables and non-hydro renewables capacity have increased from about 85 to over 650 GW (almost 7 times) in a decade. At the end of 2015, the worldwide capacity of wind generators was of 432 419 MW (over 432 GW), representing an increase of 17% as compared to the previous year. The countries with the largest installed capacity in wind farms at the end of 2015 are: China - 145 GW; United States - 74.5 GW; Germany - 45 GW; India - 25 GW; Spain - 23 GW. Wind energy production capacity has grown constantly worldwide, reaching 433 GW by 2015 according to the Global Status Report of Renewable Energy Network 21. In 2017, over 90% of countries have established policies and targets for reducing pollution and exploitation of renewable energy sources. Wind energy is considered as one of the most sustainable options. It is estimated that global recoverable wind energy stands at about 53000 TWh (TerraWatt/hour), which is 4 times the current global consumption of electricity. Renewable energy producers and suppliers in different countries must guarantee the reliability of their products and services. Operators must provide the necessary production capacity for their plants and operations and maximize availability and efficiency, in order to have a robust growth. According to the climate mitigation strategy at least two million megawatts of renewable energy will have to be produced over the next 40 years in order to completely and efficiently replace current coal-fired and to meet the current energy needs by 2050. This is a very important goal that has become a challenge for many countries with

potential for renewable energy production. In a report published in October 2015, the International Energy Agency (IEA) predicted that renewable energy will account for 26% of global electricity production in 2020, compared to 22% in 2013. The 4 percent means the increased quality of life and accountability. It indicates a significant change in policies. According to available statistics, in the last 10 years, the production of renewable energy in the E-SRE system has increased 1000 times.

Most of the increase in energy demand comes from India and China. Renewables are the fastest growing energy source. The use of natural gas will increase much faster than that of oil or coal. Increasing population and demand for energy are putting pressure on the discovery of new resource deposits and, implicitly, on producers' investment budgets. Our research is focused on OECD member states and is aimed at policy makers with the intention of informing and inspiring them in adopting a vision consistent with the real needs of the present. Member States of the Organization for Economic Cooperation and Development (OECD) must invest over $ 7.6 trillion over the next 25 years to achieve energy policy goals, reduce emissions and create a sustainable electricity generation system. Our research is based on principal component analysis (PCA) and clustering analysis for the assessment of the renewable energies from the OECD member states.

3. Aims of the research

The main aim of our research is to find the key factors influencing renewable energy production and generation in OECD member states. This analysis is performed by means of PCA, with the purpose to extract the smallest number of principal components, according to some criteria, which will retain the most possible amount of information in the dataset.

4. Research Methods

Principal Component Analysis (PCA) is a multivariate statistical technique for reducing a dataset of interrelated variables to fewer uncorrelated principal components (PCs or factors). These new uncorrelated variables maximize the variance. PCA aim is to bring out strong patterns from large datasets (Wilks, 1995; Jolliffe, 2010). We selected 13 variables, taken from various databases: OECD, Our World in Data, International Energy Agency (IEA) and International Renewable Energy Agency (Irena), available for 2017 and 2018: Primary energy supply (toe _1000USD) (V1), Electricity generation (Gigawatt-hours) (V2), Renewable energy (Ktoe) (V3), Traditional biofuels (terawatt-hours) (V4), Hydropower (terawatt-hours) (V5), Solar (terawatt-hours) (V6), Wind and other renewables (terawatt-hours) (V7), Energy production (ktoe) (V8), Energy imports (ktoe) (V9), Energy exports (ktoe) (V10), Energy capacity (MW) (V11), Energy generation (GWh) (V12) and Nominal GDP per capita (USD) (V13).

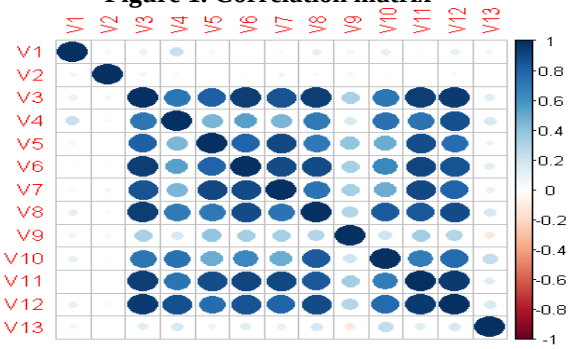
5. Findings

The first step of PCA is to observe correlations among variables. The correlation matrix among the 13 variables is represented in Figure 1. Positive correlations are represented in blue and negative correlations in red. Colour intensity and circle size are proportional to the correlation coefficients. In our case only strong and weak positive correlations are predominant. From the correlation matrix we notice the highest correlations between renewable energy and hydropower; renewable energy and energy capacity; renewable energy and energy generation.

For PCA we applied the statistical program Xlstat under Excel.

The model can be considered valid since Bartlett's sphericity test has the value of 721.879 (Sig <0.0001) and Kaiser-Meyer-Olkin measure of sampling adequacy is 0.675>0.5.

Figure 1. Correlation matrix



Source: Authors

We will perform PCA analysis on the correlation matrix in Figure 1 since the variables are measured in different units and we want to obtain factors over which all variables have a balanced impact. The 13 variables have been grouped into 3 factors with eigenvalues greater than 1, accounting for 76.098% of the total variance. Factor 1 explains 57.44% of the total variance, Factor 2 explains 10.793% and Factor 3 explains 7.866%. The informational loss is about 23.9%.

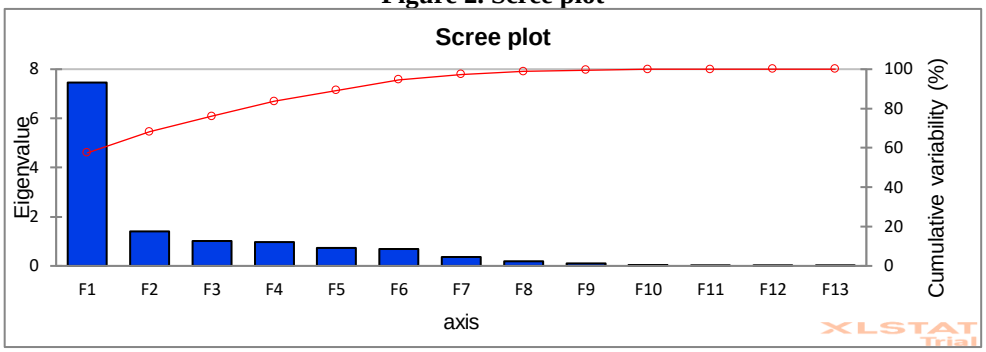
Table 1. Eigenvalues, individual variability (%) and cumulative variability (%)

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Eigenvalue	7,467	1,403	1,023	0,978	0,73	0,697	0,353	0,198	0,095	0,039	0,012	0,004	0
Variability %	57,44	10,793	7,866	7,5	5,618	5,360	2,714	1,526	0,728	0,297	0,096	0,033	0,003
Cumulative %	57,44	68,232	76,098	83,625	89,243	94,603	97,317	98,843	99,571	99,868	99,964	99,957	100

Source: Authors

Besides the eigenvalues, the scree plot (figure 2) plots the variances represented by eigenvalues against the number of factors. From the scree plot we will retain the first three factors capturing 76.098% of the information contained in the original data.

Figure 2. Scree plot



Source: Authors

The elements of the eigenvalues are the coefficients or the loadings of the factors. In table 2 we show the loadings of the three retained factors.

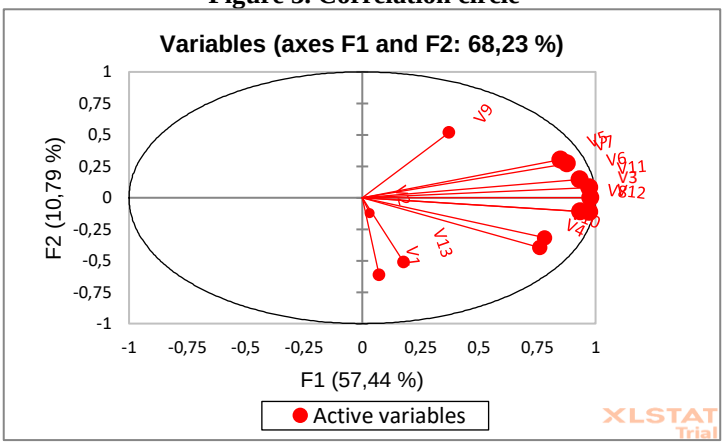
Table 2. Factor loadings

Factor loadings	Factor 1	Factor 2	Factor 3
V1	0.072	(-0.616)	0.279
V2	0.034	-0.128	(0.887)
V3	(0.980)	0.001	0.044
V4	(0.762)	-0.397	-0.008
V5	(0.850)	0.303	0.021
V6	(0.932)	0.145	-0.002
V7	(0.879)	0.271	0.068
V8	(0.936)	-0.109	-0.006
V9	0.372	(0.518)	0.060
V10	(0.784)	-0.318	-0.139
V11	(0.974)	0.081	-0.011
V12	(0.973)	-0.113	0.004
V13	0.178	(-0.513)	-0.357

Source: Authors

Loadings greater than an absolute value of 0.5 are shown in parentheses. The factors are interpreted by the magnitude and direction of the factor loadings. The larger the absolute value of the factor loadings, the bigger the impact that loading has on that factor. We extracted the most correlated variables with each factor. The main determinants of factor one are: Renewable energy (V3) with the magnitude -0.980, Traditional biofuels (V4) with -0.762, Hydropower (V5) with -0.850, Solar (V6) with -0.932, Wind and other renewables (V7) with -0.879; Energy production (V8) with -0.936, Energy exports (V10) with -0.784, Energy capacity (V11) with -0.974, Energy generation (V12) with -0.973. Thus, factor one measures the main renewable energy sources: traditional biofuels, hydropower, solar, wind and other renewables. Factor two is dominated by Primary energy supply (V1) with negative magnitude -0.616, Energy imports (V9) with positive magnitude 0.518 and GDP per capita (V13) with negative magnitude (-0.513). Factor three measures Electricity generation (V2) with magnitude -0.887. In figure 3 the axes are given by the principal directions, in which the data varies. Factor one axis is the main direction, along which the data shows the greatest variation (57.44%), and factor 2 axis, orthogonal with factor one, gives the second most important direction (10.79%).

Figure 3. Correlation circle

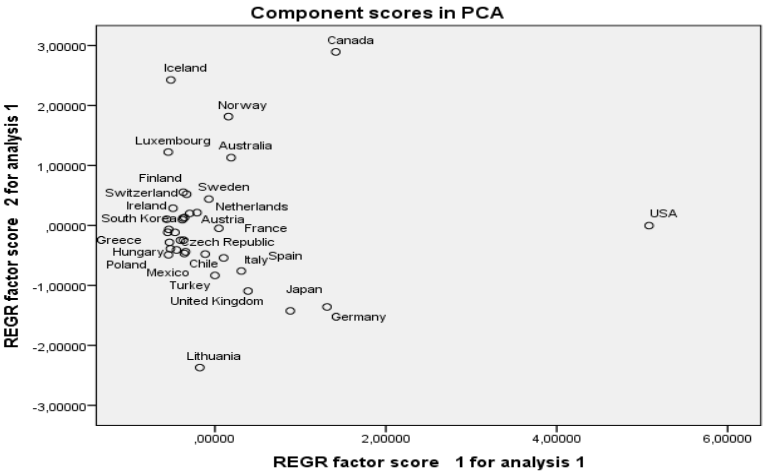


Source: Authors

The correlation circle describes the relationships between all variables. Positively correlated variables are grouped together, meaning that in our case all 13 variables are positively correlated (Kassambara, 2017), a fact confirmed by the correlation matrix in figure 1. At the same time the correlation circle is related with the loading factors from table 4 and their impact on the first two factors. According to an article from Click Energy (Click Energy, 2020), among the 12 countries leading the way in renewable energy, from our set of OECD countries, Iceland is the top electricity producer from renewables. Iceland's energy comes almost 100% from renewable energy, especially geothermal and hydroelectric power plants. Sweden gave up the use of fossil fuels and invested more in energy power, solar

power and smart grids (Haller, 2020). The most part of the energy UK produces comes from wind power rather than coal power plants, while Ireland follows the same (Raišienė et al., 2019) trend. Denmark produces almost 40% of its electricity from wind power and intends to entirely give up fossil fuel by 2050.17.3% of Canada's energy comes from renewables (Government of Canada, 2020), compared to OECD countries which have a share in renewables of 10.2% in their energy supply. On an international scale, US' renewable energy ranks third with 9% of the world production, while Canada ranks seventh with 7%. This explains the distinct position of US and Canada on the component score plot.

Figure 4. Component scores plot



Source: Authors

6. Conclusions

The present study applied PCA based on 13 variables and three factors explaining 76.098% of the total variance have been retained, the informational loss being of about 23.9%. The results revealed that factor 1 accounting for 57.44% of the total variance is negatively correlated with most of the renewable energy indicators. Therefore, we can say that factor 1 comprises renewable energy sources: traditional biofuels, hydropower, solar, wind and other renewables, as well as energy imports, exports, capacity and generation. The component score plot revealed that Canada, USA and Iceland are outliers in this representation.

Future research should be based on time-series analysis, e.g. moving average, autoregressive moving average, exponential smoothing, etc. A multivariate approach would be recommended based on sufficient data. The results of our research show that renewable energy sources have a positive and direct influence on economic and social indicators integrated and processed with PCA. Economic implications increase electricity production and lower production costs, while social implications increase the quality of life and environmental protection.

References

[1] Adamisin, P., Kotulic, R., Mura, L., Kravcakova Vozarova, I., Vavrek, R. (2018). Managerial approaches of environmental projects: an empirical study. *Polish Journal of Management Studies*, 17(1), pp. 27-38.

[2] Al-Tkhayneh, K., Kot, S., Shestak, V. (2019). Motivation and demotivation factors affecting productivity in public sector. *Administrație și Management Public*, 33, pp. 77-102, DOI: 10.24818/amp/2019.33-05.

[3] Androniceanu, A., Tvaronavičienė, M. (2019). Developing a holistic system for social assistance services based on effective and sustainable partnerships. *Administrație si Management Public*, 33, pp. 103-118, DOI: 10.24818/amp/2019.33-06.

[4] Çera, G., Meço, M., Çera, E., Maloku, S. (2019). The effect of institutional constraints and business network on trust in government: an institutional perspective. *Administratie și Management Public*, 33, pp. 6-19, DOI: 10.24818/amp/2019.33-01.

[5] Chehabeddine, M., Tvaronavičienė, M. (2020). Securing regional development. *Insights into Regional Development*, 2(1), pp. 430-442. http://doi.org/10.9770/IRD.2020.2.1(3).

[6] Click Energy. *12 Countries Leading the Way in Renewable Energy*. Retrieved from: https://www.clickenergy.com.au/news-blog/12-countries-leading-the-way-in-renewable-energy/. Accessed on 26 June 2020.

[7] Dan, H. (2019). Culturally green – an investigation into the cultural determinants of environmental performance, *Forum Scientiae Oeconomia*, 7(2), pp. 107-126. DOI: 10.23762/FSO_VOL7_NO2_7.

[8] Droes, M. I., Koster, H. R. A. (2020). Renewable energy and negative externalities: The effect of wind turbines on house prices. *Journal of Urban* Economics, 96, pp. 121-141. DOI: 10.1016/j.jue.2016.09.001.

[9] Dudin, M. N., Frolova, E. E., Protopopova, O. V., Mamedov, A. A., & Odintsov, S. V. (2019). Study of innovative technologies in the energy industry: nontradițional and renewable energy sources. *Entrepreneurship and Sustainability Issues*, 6(4), pp. 1704-1713. http://doi.org/10.9770/jesi.2019.6.4(11).

[10] Duľová Spišáková, E., Mura, L., Gontkovičová, B., Hajduová, Z. (2017). R&D in the context of Europe 2020 in selected countries. *Economic Computation and Economic Cybernetics Studies and Research*, 51(4), pp. 243-261.

[11] El Idrissi, N. E. A., Ilham Zerrouk, I., Zirari, N., & Monni, S. (2020). Comparative study between two innovative clusters in Morocco and Italy. *Insights into Regional Development*, 2(1), pp. 400-417. http://doi.org/10.9770/IRD.2020.2.1(1).

[12] Government of Canada (2020). *Renewable Energy Facts*. Retrieved from: https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/renewable-energy-facts/20069. Accessed on 16 July 2020.

[13] Haller, A. (2020). From classical and neoclassical economic growth to degrowth in Europe. Challenges for public administration. *Administrație și Management Public*, 34, pp. 150-170. DOI: 10.24818/amp/2020.34-9.

[14] Haseeb, M., Kot, S., Hussain, H. I., Mihardjo, L. W. W., Saluga, P. (2020). Modelling the non-linear energy intensity effect based on a quantile-on-quantile approach: The case of textiles manufacturing in asian countries. *Energies*, 13(9), art. no. 2229.

[15] Jolliffe, I. T. (2010). *Principal Component Analysis*, Second Edition, Springer, New York.

[16] Kassambara, A. (2017). *Practical Guide to Principal Component Methods in R*, Sthda.

[17] Kelić, I., Erceg, A., & Čandrlić Dankoš, I. (2020). Increasing tourism competitiveness: Connecting Blue and Green Croatia. *Journal of Tourism and Services*, 20(11), pp. 132-149.

[18] Mesagan, E.P., & Olunkwa, N. C. (2020). Energy consumption, capital investment and environmental degradation: the African experience, *Forum Scientiae Oeconomia*, 8(1), pp. 5-16. DOI: 10.23762/FSO_VOL8_NO1_1.

[19] Mikhaylov, A., Moiseev, N., Aleshin, K., & Burkhardt, T. (2020). Global climate change and greenhouse effect. *Entrepreneurship and Sustainability Issues*, 7(4), pp. 2897-2913. http://doi.org/10.9770/jesi.2020.7.4(21).

[20] Raišienė, A. G., Bilan, S., Smalskys, V., Gečienė, J. (2019). Emerging changes in attitudes to inter-institutional collaboration: the case of organizations providing social services in communities. *Administrație și Management Public*, 33, pp. 34-56, DOI: 10.24818/amp/2019.33-03.

[21] Sabishchenko, O., Rębilas, R., Sczygiol, N., Urbański, M. (2020). Ukraine energy sector management using hybrid renewable energy systems. *Energies*, 13(7), art. no. 1776.

[22] Tkachuk, I., & Vinnychuk, O. (2020). Impact of specific macroeconomic indicators on the formation of revenues of non-governmental organizations from personal contributions of the Ukrainian population. *Administrație și Management Public*, 34, pp. 64-77. DOI: 10.24818/amp/2020.34-04.

[23] Vu, H. M, Ngo, V. M. (2019). Strategy Development from Triangulated Viewpoints for a Fast Growing Destination Toward Sustainable Tourism Development – A Case Of Phu Quoc Islands in Vietnam, *Journal of Tourism and Services*, 10(18), pp. 117-140.

[24] Zhang, XC., Ma, C., Song, X., Zhou, YY., Chen, WP. (2016). The impacts of wind technology advancement on future global energy. *Applied Energy*, 184, pp. 1033-1037.

[25] Žižka, M., Pelloneová, N. (2019). Do clusters with public support perform better? Case study of Czech cluster organizations. *Administrație și Management Public*, 33, pp. 20-33, DOI: 10.24818/amp/2019.33-02.

[26] Wilks, D. S. (1995). *Statistical Methods in the Atmospheric Sciences: An Introduction*. San Diego: Academic Press.

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Possibilities to Improve Risk Management in the Context of Implementing a Quality Management System

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Abstract

Nowadays, companies have to reinvent themselves to continue operating successfully. The purpose of this paper is to identify opportunities to improve risk management at the organizational level, in the context of implementing a quality management system in accordance with the international standard ISO 9001. In order to achieve the objective, the main risks were identified, the level of each identified risk was determined and actions to treat the identified risks were proposed. By applying this method, it was intended to ensure that the risk assessment serves as a basis for making sound decision on necessary actions to address the identified risks. According to the research results, the application of the method on the analysed organization had a positive impact. The method applied in this study can be used in any organization that aims to improve risk management by identifying the risks associated with the activities carried out and by correctly establishing measures to treat them.

Keywords: Risk management, quality management system, risk assessment, risk matrix, organisation.

JEL Classification: L15, Q01

1. Introduction

Nowadays, the business environment is increasingly complex, requiring organizations to be able to quickly adapt to the evolving context. Therefore, a method based on the principles of risk management can improve business performance and support future researches on this topic.

Within organizations, risk management involves a decision-making process following which the results of risk assessment are integrated with economic,

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technical, social principles to generate risk management strategies (Aytasova et al., 2019). The main purpose of risk management is to facilitate the understanding of the risks to which the organization is exposed, so that these risks can be managed and the organization can achieve its defined objectives (Ścierski, J. M., 2012, Samani et al., 2019).

Risk management involves a wide range of rigorously defined and performed activities, which ensure the identification and analysis of risks, followed by the definition of measures necessary to manage their effects (eliminate / reduce / transfer / accept). These activities usually take place at all levels of the organization (Deysher, B., 2015).

During the planning phase, the ISO 9001: 2015 standard provides requirements regarding the identification of risks, their assessment and the definition of corresponding risk treatment. When within an organization's quality management system, the risks are properly managed, the degree of achievement of objectives is increased and the process of identifying opportunities and threats is improved, thus establishing a secure basis for decision-making and for the prevention of losses and incidents.

2. Literature review

Within the organizations we must have a unitary approach in terms of risk management, an approach more important as risk management is a cyclical process that includes several stages. In a broad sense, risk management involves more interrelated processes, namely: systematic and continuous investigation of exposures to various risks or losses, assessing their nature, frequency, severity and potential impact, planning and organizing appropriate techniques for controlling risks to minimize losses and capitalize on opportunities, implementation of such techniques, both internally and externally (Ciocoiu, C. N., 2008).

From the point of view of risks, we must have a unified approach within organizations. In this context, the risk can be understood as a deviation from the desired state in both negative and positive effects. It is generally presented as a product of the probability of occurrence of the hazard and its effects. From the perspective of the organization's processes, the identification of risks is related to the specification of the dangers that an organization may encounter during the process of implementing a given solution. The process of identifying potential hazards is a key point in the context of the outcome of the risk assessment (Deptuła et al., 2015).

Within organizations, for financial or non-financial reasons, intentional neglect of risk is recognized as a risky strategy. Staying in a certain market requires that an organization has a high-risk strategy which, very often, also involves high costs (Firm, K. S., 2014).

There is a wide array of approaches to risk management. People used to manage risks through intuition or experience. The increasing complexity of the business environment and the adoption of a systematic approach to risk management have

led to the emergence of different standards and frameworks for risk management (Saleh, A., 2017).

An important aspect is the standardization of processes at the level of organizations, the clear definition of procedures and guidelines. Starting with 2010, the notions of "risk management" and "risk" appear in the international standards ISO 31000 and ISO 31010. The International Organization for Standardization (ISO), through Working Group ISO / TC 262, has developed the ISO 31000 series of standards on risk management, which help organizations to assess their risks and obtain the best results in relation to the established objectives. So far, ISO has published 4 standards in this series and another 5 standards are under development (www.iso.org).

In the context of the facts presented above, the international standard ISO 31000 on risk management, revised in 2018, defines risk as "the effect of uncertainty on objectives, the effect being a deviation from what is expected." It can be positive, negative or both and can treat, create or lead to opportunities and threats. Also, within the mentioned standard, risk management is defined as coordinated activities to guide and control an organization in terms of risk. (www.iso.org).

There is no generally valid approach to risk assessment performed by organizations. Several methods of risk assessment can be highlighted in the literature: Preliminary hazard analysis (PHA), Failure mode and effects analysis (FMEA), Failure mode, effects and criticality analysis (FMECA), Event trees, Fault tree analysis (FTA), Human reliability analysis (HRA) or Probabilistic risk assessment (PRA) (Ostrom, L.T., Wilhelmsen, C.A., 2019), but each organization decides which method to use and establishes its own procedure for identifying and assessing risks (Korshunov, G. I., 2019).

On the other hand, in order to comply with the international standard ISO 9001: 2015 for quality management systems, organizations must plan and implement risk management actions, in order to increase the effectiveness of the quality management system, to achieve improved results and to prevent the negative effects of risks (Gunasekaran et al., 2019).

3. Research Questions/Aims of the research

The main objective of the study conducted by the authors was to identify opportunities to improve risk management at the organizational level, in the context of implementing a quality management system according to the international standard ISO 9001, in order to achieve the established goals.

4. Research Methods

In order to achieve the mentioned objective, the study was carried out on the example of a sports club in Romania which has a quality management system implemented and certified according to the ISO 9001: 2015 standard. The core business for this sports club is the organization and provision of swimming lessons for children, as well as the organization of sports activities and competitions for a

wide array of customer segments: children, adults, professional and amateur athletes. The customer base includes both private beneficiaries and preschool and primary education institutions and organizations. (kindergartens, after-school centres). The team consists of 8 instructors who are former professional athletes, professionally certified, selected by the club management based on professional criteria as well as on their skills and abilities for communicating and interacting with children and adults.

In case of this organization, risk management is a process in which all personnel takes part and involves the identification of risks in the activities carried out, their assessment, treatment, monitoring and periodical re-evaluation.

In order to identify the risks, the first step is the analysis of the sources of risk, the areas of impact, the events, as well as the causes of the risks and their potential consequences. The purpose of this stage is to generate an exhaustive list of risks based on those events that could stop or delay the achievement of objectives.

The general manager of the sports club is the risk manager, and the other employees are part of the risk management team. The risk manager coordinates the activities of risk identification and analysis, manages the status of risk management measures application, promotes the idea of encouraging employees to get involved in risk avoidance processes within the organization, and estimates the risks-related budget. Team members help to identify, analyse and monitor risks, propose measures to reduce / eliminate risks and inform the risk manager about new risks when they appear.

In the study, data on risk identification within this organization was obtained based on information provided by persons involved in similar businesses, obtained as a result of assessments made by authors including during training / swimming lessons and taking into account the applicable legislation. Risk identification was performed through brainstorming sessions, taking into account the business activities performed with an emphasis on the critical assets of the organization. All identified risks were recorded in the Risk Register (Table 4).

The identified risks analysis provides input for risk assessment, for decision-making on the need to treat risks and the most appropriate method for risk management. The analysis of the identified risks was performed over a period of 6 months, and after this period monthly monitoring of the evolution of risks took place. Team members met three times to develop and review estimates of identified risks, ensuring that the list of critical risks was periodically updated.

In this study, the probability and the impact of the identified risks were estimated on a scale of 1 to 5, according to Tables 1 and 2. The analysed risks were revised and the estimates were adjusted, where necessary.

Table 1. Risks impact

Level	Impact	Description	Values
1	Insignificant	does not impact reputation, financial losses are very small or non-existent	1
2	Minor	does not cause significant problems and involves low financial losses	2
3	Moderate	can cause operational problems, but can be solved by allocating appropriate financing	3
4	Major / critical	creates difficulties in achieving the company's strategy or in achieving the project objectives and can cause significant financial losses	4
5	Catastrophic	endangers the company's strategy or project objectives, its financial situation or even people's health	5

Source: author's own development

Table 2. Risks probability

Level	Risk probability	Description	Values
1	very rare	it can occur very rarely	1
2	rare	it can occur sometimes	2
3	moderate	almost equal chance of occurrence vs non-occurrence	3
4	probable	it occurs quite often	4
5	almost certain	occurs very often	5

Source: author's own development

Based on Risks impact and Risks probability, the members of the risk team completed the risk matrix, presented in Table 3, and decided that all risks with values lower than 5 are reduced risks, between 5 and 15 are moderate risks and those with values higher than 14 are critical risks. The value of each risk is calculated as the product of probability and impact.

Table 3. Risk matrix

Probability	5	moderate	moderate	critical	critical	critical
	4	reduced	moderate	moderate	critical	critical
	3	reduced	moderate	moderate	moderate	critical
	2	reduced	reduced	moderate	moderate	moderate
	1	reduced	reduced	reduced	reduced	moderate
		1	2	3	4	5
		Impact				

Source: author's own development

The purpose of risk assessment is to serve as a basis for decision-making in terms of the measures to address these risks. Critical risks were addressed immediately, followed by moderate and reduced risks.

Risk management involved selecting one or more options for treating the risks (Avoid - eliminate risk by avoiding or rethinking the activity, Mitigate - reduce the probability or the impact of risk, Transfer - transfer of risk, for example by insurance, Acceptance of risk - without risks, the level of risk is considered acceptable) and implementing those options. The risk management plan documents how the risk scaling options will be implemented and contains information on responsibilities, deadlines and resources.

Following the brainstorming sessions, the most important risks were assigned to the team members so that they could recommend treatment measures. For each risk, treatment measures which acted either on the probability of occurrence or on the impact of the risk were recommended. Each member of the risk assessment team proposed measures for the assigned risks and forwarded them to the risk manager. The risk treatment action plan integrated all the risks analysed.

It is recommended that monitoring and reviewing risks be a planned, recurring activity with clearly defined responsibilities. At this stage, the effects of the risk management measures are assessed and updated for the risks where no favourable effects have been found.

Risk monitoring involves tracking the risk management plan throughout the activities implementation period. The study aimed to review and improve the risk management plan by constantly updating the data included in the plan and by routine controls carried out in order to identify new risks or observe previously identified risk factors.

The probability of occurrence and the impact of each risk are reassessed and modified whenever necessary. If a new risk is identified, it is analysed and included in the list of risks in order to establish appropriate treatment measures.

5. Findings

As a result of the study carried out within the selected organization (sports club), the risks and prevention methods were identified. The Risk Register (Table 4) presents the risks associated with the activities of the sports club, identified at the beginning of the research. For each identified risk, treatment measures, responsibilities, deadlines and resources were established, and the information was documented in the Plan of measures for risk management (Table 5). These measures were implemented during a calendar year.

Table 4. The initial register of risks, at the beginning of the research by the authors, within the organization

Risk no.	Identified risk	Probability	Impact	Risk level	Risk category
1	Sickness of the athletes	3	5	15	critical risk
2	Sickness of instructors	2	5	10	moderate risk
3	Injuries of athletes	2	5	10	moderate risk
4	Death by drowning	1	5	5	moderate risk
5	Dissatisfaction of athletes due to lack of professional training and behaviour of coaches / instructors	2	3	6	moderate risk
6	Fire / emergency situations	1	5	5	moderate risk
7	Increasing number of competitors (other clubs, associations)	4	3	12	moderate risk
8	Loss / reduction of activities premises (termination / modification of leases)	2	5	10	moderate risk
9	Loss of reputation caused by third parties, club members, coaches / instructors or members of athletes' families	3	3	9	moderate risk

Source: author's own development

Table 5. Measures plan regarding the treatment of risks

Risk no.	Possible risk management measures	Responsible	Deadline	Resources
1	Carrying out the activity only in heated, air-conditioned, ventilated and properly arranged locations, clean and equipped with all the necessary facilities to ensure health and safety	General manager	immediate	Financial resources
1	Including in contracts the obligation of the owner / administrator of the premises to perform water analysis periodically, as frequently as possible, and to present all the analysis bulletins to the sports club management	General manager	immediate	Human resources
1	The parents signing declarations on their own responsibility regarding the child's state of health and the possible risks associated with the sport she/he will practice and submitting a medical certificate confirming that she/he is fit for sports	instructors	immediate	Human resources
1	Performing mandatory medical examinations for all athletes in performance groups	instructors	monthly	Financial resources
2	Carrying out the mandatory annual medical checks for all the employees of the club, according to the legislation regarding the health and safety at work	instructors	annual	Financial resources
3	Carrying out the activity only in properly secured spaces	General manager	immediate	Financial resources
3	Permanently accompanying kids under 10 years old in locker rooms, on hallways and stairs, on the edge of the pool;	instructors	permanent	Human resources
3	Interdiction of playing games or running on the edge of the pool	instructors	permanent	Human resources
3	Interdiction of wearing inappropriate footwear inside the premises for sports	instructors	permanent	Human resources

Risk no.	Possible risk management measures	Responsible	Deadline	Resources
	activities			
3 and 4	Periodic training of instructors / coaches in first aid provision	General manager	half-yearly	Financial resources
4	Presence of at least 2 coaches / instructors for each group of athletes	instructors	permanent	Human resources
4	Presence of at least 1 instructor / coach in the water during the entire period of swimming lessons with athletes taking beginner courses	instructors	permanent	Human resources
4	Limiting the groups of children for the initiation courses to 8-10 children accompanied by 2-3 instructors	instructors	permanent	Human resources
4	Customizing the training program according to the level and skills of each athlete, as well as according to her/his capacity for effort	instructors	permanent	Human resources
4	Permanent equipping of instructors during training hours and during competitions with adequate equipment, allowing their immediate entry into the water when needed	General manager	permanent	Financial resources
5	Recruitment and selection of staff based on education, professional experience and professional certificates	General manager	permanent	Financial resources
5	Forming mixed teams of coaches, in which the most experienced member can ensure the continuous training of those with less experience	General manager	permanent	Financial resources
6	Periodical training of employees, according to current legislation	General manager	quarterly	Financial resources
6	Participation in simulations and tactical exercises organized in the locations where the activity takes place	General manager	half-yearly	Financial resources

Risk no.	Possible risk management measures	Responsible	Deadline	Resources
7	Maintaining good communication and collaboration between athletes and coaches	instructors	permanent	Human resources
7	Diversification of activities, involvement in new projects	General manager	permanent	Financial resources
8	Timely payment of the amounts due according to the contracts signed with the owners of the spaces where the activity takes place	General manager	monthly	Financial resources
8	Permanent search for new locations, which can offer better conditions or opportunities for expansion and development of the activity	General manager	permanent	Financial resources
9	Compliance with the rules of the Code of Conduct, the behaviour and attitude of the club members (coaches, parents and athletes)	instructors	permanent	Human resources
9	Designation of an authorized person to answer and discuss with third parties in order to immediately answer any questions or requests addressed on all communication channels (website, facebook, telephones)	General manager	immediate	Financial resources
9	Permanent maintenance by the general director of the club of good relationship with the owners / administrators of the spaces, with the state institutions, with the officials from the federations, with referees and delegates of the national or international forums	General manager	permanent	Human resources

Source: author's own development

One year after the initial identification of the risks and the implementation of the treatment measures established in the Plan of measures regarding the treatment of the risks, a risk reassessment was performed (Table 6).

Table 6. Risk register after 1 year

Risk no.	Identified risk	Initial		After 1 year			
		Risk level	Risk category	Probability	Impact	Risk level	Risk category
1	Sickness of the athletes	15	critical risk	2	5	10	moderate risk
2	Sickness of instructors	10	moderate risk	1	5	5	moderate risk
3	Injuries of athletes	10	moderate risk	1	5	5	moderate risk
4	Death by drowning	5	moderate risk	1	5	5	moderate risk
5	Dissatisfaction of athletes due to lack of professional training and behaviour of coaches / instructors	6	moderate risk	1	3	3	reduced risk
6	Fire / emergency situations	5	moderate risk	1	5	5	moderate risk
7	Increasing number of competitors (other clubs, associations)	12	moderate risk	4	2	8	moderate risk
8	Loss / reduction of activities premises (termination / modification of leases)	10	moderate risk	1	5	5	moderate risk
9	Loss of reputation caused by third parties, club members, coaches / instructors or members of athletes' families	9	moderate risk	2	3	6	moderate risk

Source: author's own development

6. Conclusions

The proposed paper aims to complement studies on risk management within organizations, highlighting the specificity of the risk-based approach in quality management. From a strategic point of view, the purpose of applying risk management in the processes of an organization is primarily to minimize the vulnerability of the organization, risk management becoming a shield of protection, maintained by the proactive attitude to risk.

The context of the organization is made up of the actions of all stakeholders, such as: coaches, professional organizations, beneficiaries, management, owners, etc. Each of them has its own interests, culture, actions on the organization and generates certain risks that the organization must identify, evaluate and address (keep under control). By implementing the quality management system, the organization must take into account all the requirements and needs of stakeholders and including the risks they generate. By integrating risk management into the quality management system, organizations easily manage their opportunities and threats, for achieving established goals.

Regarding our study, as a result of the risk reassessment one year after the start of the study, it is observed that out of the 9 risks initially identified, 2 were classified in a lower risk category than the initial one, as follows: a critical risk passed into the moderate risk category and 1 moderate risk was included in the reduced risk category. The remaining moderate risks remained in this category, however, at a lower risk level score.

We consider that the research contributed to the improvement of the performance of the sports club's processes by decreasing the impact of the risks associated with the activities carried out, as a result of the application of the risk treatment measures proposed and implemented.

The applied method in this study can be used in organizations in other fields that want to improve risk management by identifying the risks associated with the activities they carry out and by correctly establishing measures to treat them.

References

[1] Aytasova, A. S., Solopova, N. A., Karpenko, P. A. (2019). *Development the Risk Management System of Processes in the Enterprise*, IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering (EIConRus), Saint Petersburg and Moscow, Russia, pp. 1357-1360. DOI: 10.1109/EIConRus.2019. 8657147.

[2] Ciocoiu, C. N. (2008). *Risk management − theories, practices, methodologies*, vol. 1, Editura ASE, pp. 49-50, 53.

[3] Deptuła, A. M., Knosala, R. (2015*). Risk assessment of the innovative projects implementation, Management and Production Engineering Review*, 6(4), Dec. 2015, pp. 15-25.

[4] Deysher, B. (2015). *A "Risk Based Thinking" Model for ISO 9001:2015*, http:// asq.org/audit/2015/01/a-risk-based-thinking-model-for-iso-9001-2015.pdf, accessed to 18.06.2019.

[5] Gunasekaran, A., Subramanian, N., Ngai, W.T.E. (2019). Quality management in the 21st century enterprises: Research pathway towards Industry 4.0, *International Journal of Production Economics*, Vol. 207, January 2019, pp. 125-129, https://doi.org/10.1016/j.ijpe.2018.09.005.

[6] Firm, K. S. (2014). *Risk, Innovation and the Extended Enterprise*, https://www.theirm.org/media/1048473/EE-Chapter-2.2-Risk-and-Innovation.pdf, accessed to 19.06.2019.

[7] Fobel, P., Forgon, T., Klimentová Fobelová, Monika (2019). *Innovation management in good practice context*, *Management Systems in Production Engineering*, 27(2), pp. 69-73.

[8] ISO https://www.iso.org/committee/629121/x/catalogue/p/0/u/1/w/0/d/0 accessed to 17.02.2020.

[9] ISO 9001: 2015 Quality management systems- requirements.

[10] ISO 31000:2018 Risk management − Guidelines.

[11] ISO/ IEC 31010: 2019 Risk management − Risk assessment techniques.

[12] Korshunov, G. I. (2019). *Assessment of Risks and Capabilities in an Innovative Project Quality Managing*, Proceedings of the International Scientific Conference "Far East Con" (ISCFEC 2018), available at https://doi.org/10.2991/iscfec-18.2019.161.

[13] Ostrom, L. T., Wilhelmsen, C. A. (2019). *Risk Assessment: Tools, Techniques, and Their Applications*, John Wiley & Sons, Inc., Hoboken, USA.

[14] Saleh, A. (2017). *The Integration between Quality Management and Risk Management Systems*, available at https://ayatsaleh.com/2017/09/12/the-integration-between-quality-management-and-risk-management-systems/, accessed to 24.06.2019.

[15] Samani, M. A., Ismail, N., Leman Z., Zulkifli, N. (2019). *Development of a conceptual model for risk-based quality management system*, *Total Quality Management & Business Excellence*, 30:5-6, pp. 483-498, DOI: 10.1080/14783363.2017.1310617.

[16] Ścierski, J. M. (2012). The use of quality management systems for limiting the risk of business processes, *Scientific Journals Maritime University of Szczecin*, 32(104) z. 1, pp. 108-114.

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Efficient Business Governance – a Solution for a Sustainable Development

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Abstract

Considering the special interest shown towards the concept of corporate governance, in this paper. we want to reflect the degree of compliance of the banking companies listed on the Bucharest Stock Exchange (BSE) with the principles and provisions of the Corporate Governance Code, considering the importance of the banking sector in the financial system, the one that basically manages the liquidities in an economy. In order to achieve the purpose of this research, we analysed both annual and sustainability reports issued in the period 2017-2018 by the listed entities in the banking field in Romania included in the study by using a scoring system to rank the compliance with the principles and provisions of CGC regarding the responsibilities of the board, risk management and internal control system, fair rewards and motivation and building value through investors relations. Our analysis reflects that, although the provisions and principles issued by the Corporate Governance Code are not mandatory for the listed companies, they are largely implemented in the activity of banking companies in order to increase the level of transparency and trust, essential elements for a sustainable development.

Keywords: corporate governance, principles, BSE.

JEL Classification: M42, G34

1. Introduction

Corporate governance, or the way entities are controlled and managed, represents a concept that requires continuous improvement given the globalization of the economic environment, the major risk for a new financial crisis that may affect the world economies and also the resounding financial scandals that have imprinted on the credibility of the information published by companies.

According to the US Government Environmental Protection Agency, EPA, between 2009-2015, car manufacturer Volkswagen sold worldwide about 11 million cars equipped with illegal software meant to report lower fuel consumption

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and lower emissions than in reality. Following this scandal, Volkswagen became the target of multiple investigations and the share price fell sharply. As a result, the Chairman of the Board of Directors resigned and other board members were suspended.

Considered a symbol of the failure of control measures and of corporate fraud, the famous Enron case cannot go unmentioned. The company overestimated its profit and underestimated its debt, thus affecting the lives of many people involved in the activity of the energy company and of those who invested in its shares, given that the company's share price dropped from 90 dollars to only 50 cents over a very short period of time. In this situation as well, among those involved in the scandal we can mention the founder of the company, the CEO, the CFO and the audit and consulting company Arthur Andersen, which provided consulting and performed both internal and external audit, thus compromising the auditor's independence.

The Parmalat scandal broke when the Italian authorities discovered that billions of euro from the company funds were hidden, (one of the entities in which the funds had been diverted being called suggestively "Bucanero" − "Black hole" − so, in this case, the management that committed the fraud showed cynicism) the debts were undervalued and the accounts recorded forged documents. Following the controls put in place, both the company president and the executive directors were arrested.

Financial scandals are also encountered in South Africa, an example being the companies run by the Gupta family, who, under the inefficient supervision of the auditor, used public funds for personal purposes.

As it can be noticed from the examples above, in America, Europe and also Africa resounding financial scandals with significant impact for society, generated by the participants involved in the management of companies took place, thus reflecting the need of an efficient business governance.

2. Problem Statement

A first definition of corporate governance dates back to 1992. In the view of the specialist A. Cadbury who elaborated the Cadbury report in the UK, corporate governance reflects "the set of rules by which a company is directed and controlled", and the conclusions of the report reflect that corporate failures were due to the inefficiency of the internal control system.

According to the OECD "A good corporate governance is not an end in itself, but a means to support economic efficiency, sustainable growth and financial stability. It facilitates companies' access to capital for long-term investment and helps ensure that shareholders and other stakeholders who contribute to the success of the corporation are treated fairly." The corporate governance is defined as "a set of relationships between a company's management, its board of directors, its shareholders and other stakeholders", also providing "the structure through which the objectives of the company, as well as the means of attaining those objectives and monitoring performance are determined".

According to Professor Feleagă, corporate governance represents a set of "rules of the game" by which companies are managed and supervised by the board of directors, in order to protect the interest of all stakeholders (Feleagă et. al., 2011).

Professor Bunget O., quoted by Apostol C. (Apostol C., 2015: 21) states that corporate governance is primarily concerned with the management of the company and its structures, but it also includes issues regarding social responsibility and the ethics of business practices. (Bunget et al. 2009: 18).

The financial crisis between 2008-2012 has engulfed the global economy and has caused many bankruptcies in recent years, which should give greater importance to the way entities are managed and controlled. The most important sector and the first one affected was the credit institutions - the ones that basically manage the liquidities in an economy. Moreover, the financial-accounting frauds that can occur in the absence of an efficient business governance can have a major impact on the achievement of the economic-financial performances of companies, see the case of BRD from 2007 when the bank was very close to collapse due to a trader's transactions with derivatives that have bypassed internal control systems.

In this context, corporate governance should be seen as an essential element for the development and improvement of economic efficiency and efficacy, as an efficient system by which companies are directed, managed and controlled provided the principles issued by the OECD are respected.

3. Research Questions/Aims of the research

In this paper, we aim to reflect the degree of compliance of the banking entities listed on BSE with the principles and provisions of the Corporate Governance Code, by using the data issued in 2017 and 2018 by the companies included in the study, BRD, Transilvania Bank and Patria Bank.

4. Research Methods

We used a scoring system that reflects the extent to which the entities included in our study comply with the provisions and principles of the CGC.

Taking into account the fact that in the Comply or explain statement the companies have three options through a self-assessment that reflects the full compliance, partial compliance or non-compliance, the following table reflects the scoring system used according to the response published by the studied companies:

Table 1. Conformity marks

Conformity mark	Significance
3	Full compliance with the principles and provisions
1	Partial compliance
0	Non-compliance

Source: author's own projection

5. Findings

There isn't a certain model for an efficient corporate governance, but complying with the OECD principles can be a competitive advantage and attract new investors into the company, given that they decide to place their capital within entities that apply high standards of governance in order to ensure the profitability of their investments.

The Bucharest Stock Exchange re-established in 1995, after a period of suspension during the communist regime, represents the main stock exchange in Romania that drafted in 2001 the first Corporate governance code. A new code was developed in 2008, based on the OECD principles, which came into force in 2009 and was voluntarily implemented by the listed companies. Based on the "Apply or Explain" statement, listed companies declare their compliance or non-compliance with the principles of the Corporate Governance Code. The last code issued by BSE dates back since 2015 and replaces the original code issued in 2001 and the one revised in 2008.

The recommended principles, which mainly concern the access of investors to information and the protection of the shareholders' rights, encouraging entities to build a strong relationship with their shareholders and other stakeholders, are structured in four sections as follows:

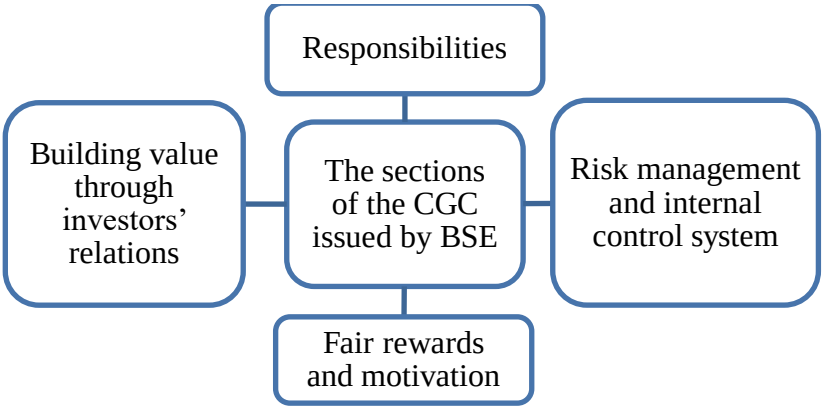

Figure 1. The sections of the CGC issued by BSE
Source: authors own elaboration

The provisions of the CGC and the way in which they are respected by the banking entities listed on the BSE are reflected below:

SECTION A – RESPONSIBILITIES – 11 Pillars

Figure 2. Section A of the CGC issued by BSE
Source: authors own elaboration after BSE CGC

The way in which the provisions of section A of the Code are respected by the listed entities can be graphically reflected as follows:

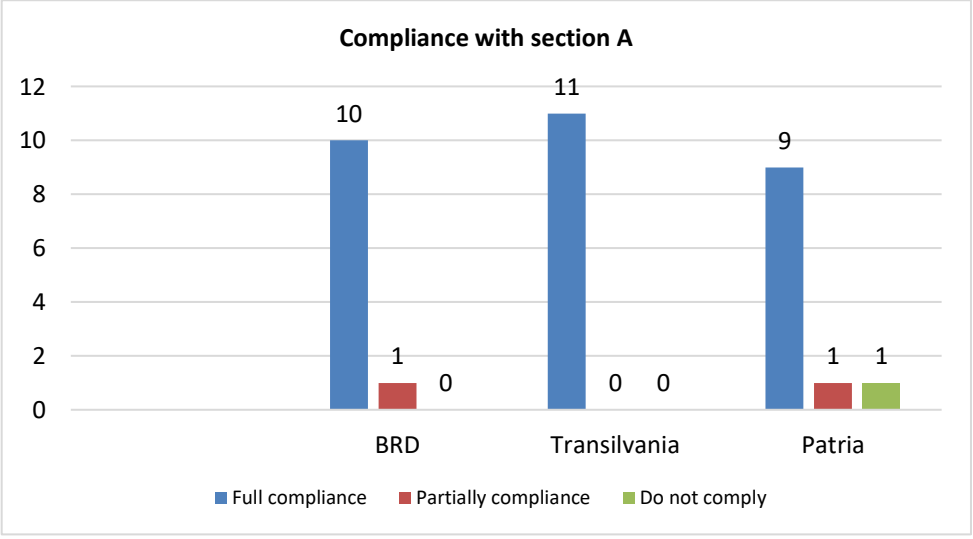

Figure 3. Entities compliance with section A
Source: authors own elaboration

SECTION B - RISK MANAGEMENT AND INTERNAL CONTROL SYSTEM – 12 Pillars

B1	•set up an audit committee
B2	•independent non-executive member of the audit committee chair
B3	•annual assessment of the system of internal control
B4	•effectiveness and scope of the internal audit function
B5	•review conflicts of interests in transactions
B6	•evaluate the efficiency of the internal control and risk management system
B7	•monitoring the application of internal audit generally accepted standards
B8	•cyclical (at least annual) reports
B9	•without preferential treatment among shareholders
B10	•transsactions equal or more than 5% of the net assets of the company must be disclosed
B11	• internal audits should be carried out by a separate structural division
B12	•the internal audit department should report functionally to the Board via the audit committee

Figure 4. Section B of the CGC issued by BSE
Source: authors own elaboration after BSE CGC

The way in which the provisions of section B of the Code are respected by the listed entities can be graphically reflected as follows:

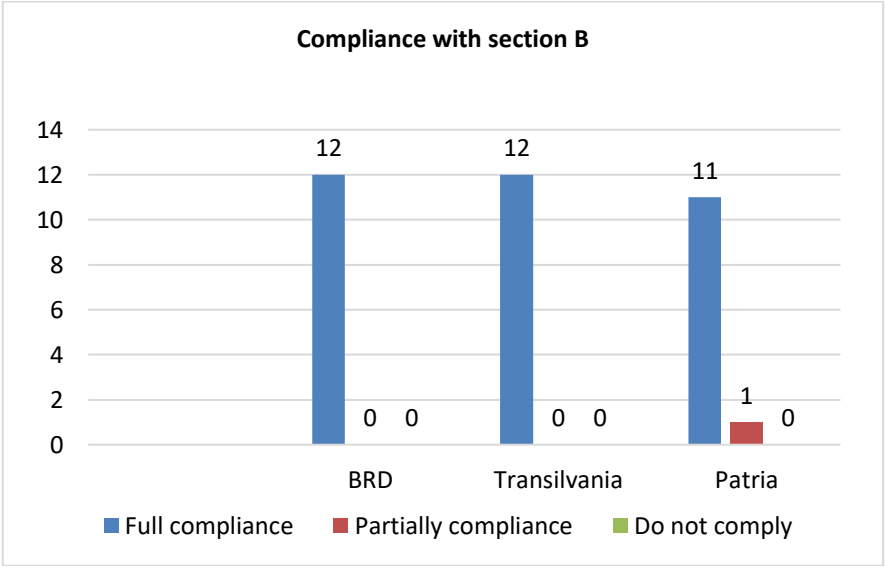

Figure 5. Entities compliance with section B
Source: authors own elaboration

SECTION C - FAIR REWARDS AND MOTIVATION – 1 PILLAR

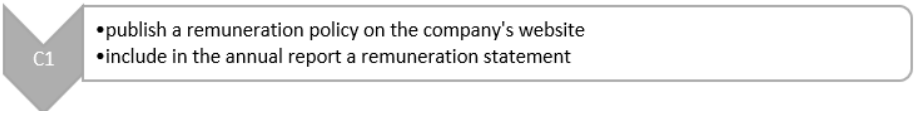

Figure 6. Section C of the CGC issued by BSE
Source: authors own elaboration after BSE CGC

The way in which the provisions of section C of the Code are respected by the listed entities can be graphically reflected as follows:

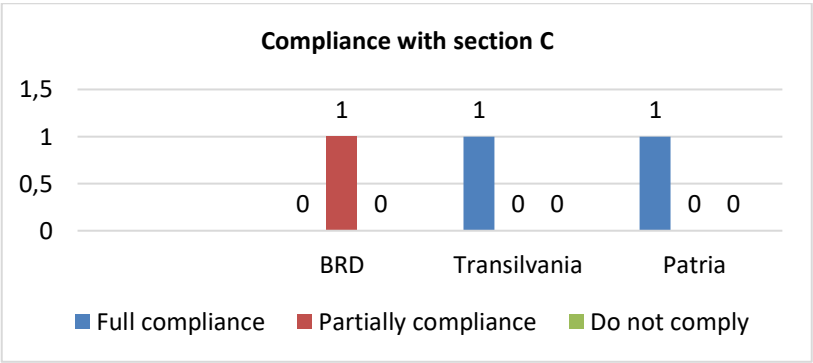

Figure 7. Entities compliance with section C
Source: authors own elaboration after BSE CGC

SECTION D - BUILDING VALUE THROUGH INVESTORS' RELATIONS – 10 PILLARS

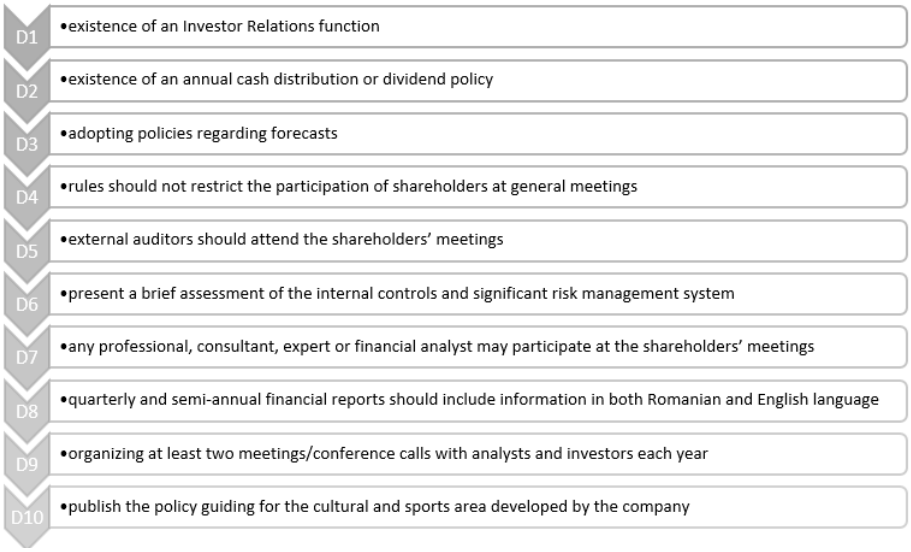

Figure 8. Section D of the CGC issued by BSE
Source: authors own elaboration after BSE CGC

The way in which the provisions of section D of the Code are respected by the listed entities can be graphically reflected as follows:

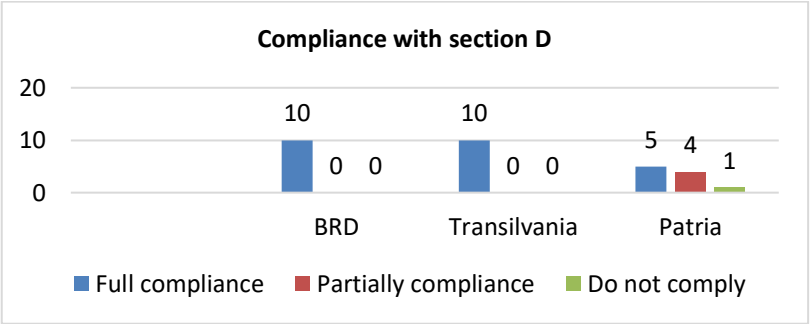

Figure 9. Entities compliance with section D
Source: authors own elaboration

Using the conformity marks, the overall perspective of the compliance of the entities in the banking field listed on the BSE with the provisions of the Corporate Governance Code, highlights the following level of conformity:

Table 2. Level of conformity with the Code s provisions

Category	Total CGC score	BRD	Transilvania	Patria
Section A score	33	32	33	28
Section B score	36	36	36	34
Section C score	3	1	3	3
Section D score	30	30	30	19
TOTAL Score	**102**	**98**	**102**	**84**
Conformity level	**100%**	**96.08%**	**100%**	**82.35%**

Source: authors own elaboration

As can be seen from the figure presented above, Transilvania Bank fully (100%) complies with the provisions of the Corporate Governance Code. Of the 34 provisions, BRD fully complies with 32, which means a 94% compliance, and 2 (6%) provisions of the Code are only partially respected. In the case of Patria Bank, (the most recently founded bank) the provisions of the Code are fully respected in a proportion of 76%, 6 (18%) provisions are partially complied and 2 (6%) provisions are not respected at all.

Analysing the Corporate governance statements and our results, we can conclude that although they are not mandatory, the provisions of the Code are largely respected and implemented within the three entities included in our study, an outcome that can represent a competitive advantage in this field. From our results, we can state, in line with Dumitrașcu et al. (2019), that in order to achieve a sustainable development, any company needs to find the balance between financial and non-financial performance.

6. Conclusions

The economic and social transformations, the registered bankruptcies, the financial crisis that affected all the economies, as well as the resounding frauds that took place have raised the interest for the significance of the corporate governance concept. It is becoming increasingly obvious that both investors and their interests are protected by an effective governance system that aligns with the practices and principles recommended by means of regulations.

The main aim of this paper was to study the compliance of banking companies listed on the Bucharest Stock Exchange with the principles and provisions of the Corporate Governance Codes issued by the main stock exchange in Romania. We believe that the ease of access to additional funds, the increase of transparency in reporting, the sustainable development in the context of globalisation and the increase of the market value of the company are the benefits of an efficient corporate governance system that can represent a competitive advantage to any economic entity. The study undertaken showed that the analysed companies comply largely with the provisions and principles of the codes, which reflect the importance given to this concept by which companies are controlled and managed. This, basically, contributed to overcoming the impasse of the Romanian banks, for example, during the economic crisis from 2008-2012 and beyond.

We are aware that this compliance with the principles of corporate governance also entails significant costs. We can include here the costs of hiring independent non-executive directors or of reporting relevant information to stakeholders, but the economic entity must adopt a system of corporate governance that allows obtaining benefits that exceed costs.

Also, the formalism of these statements of the entities must be considered, while we are aware of the limits of our study regarding the content and the way in which the analysed entities have a pro-active attitude regarding governance. A sustainable developing economy must be based on entities in which decisions and the governance system works effectively. Often, behind a formal conformity we do not find a well-balanced style of governance based on trust and transparency and balance between stakeholders - as a sine qva non condition for a successful corporate governance - as we have tried to outline the acceptance of the corporate governance term.

References

[1] Apostol, C. (2015). *Adoptarea bunelor practici de guvernanță corporativă de către companiile din România,* Editura ASE, București.

[2] BRD Annual statement (2018). Retrieved from: https://www.brd.ro.

[3] Bunget, O. C., Florea-Ianc, Z., Ghiță, M., Nicolau, C., Pereș, C. E., Pereș, I. (2009). *Guvernanţa corporativă şi auditul intern*, Editura Mirton, Timişoara.

[4] Cadbury, A. (1992). *The Financial Aspects of Corporate Governance*, Gee and Co. Ltd., London, UK.

[5] Codul de Guvernanță Corporativă al Bursei de Valori București (2015). Retrieved from: www.bvb.

[6] Dumitraşcu, M., Feleagă, L. (2019). Mission, Vision, and Values of Organizations, the Catalysts of Corporate Social Responsibility, *Audit Financiar*, vol. XVII, no. 1(153)/2019, pp. 142-148, DOI: 10.20869/AUDITF/2019/153/007.

[7] Feleagă, N., Feleagă, L., Dragomir, V., Bigioi, A. (2011). Guvernanţa corporativă în economiile emergente: cazul României, *Economie teoretică şi aplicată*, XVIII(9).

[8] OECD (2015). Principles of Corporate Governance, https://www.oecd.org/daf/ca/Corporate-Governance-Principles-ENG.pdf.

[9] Patria Bank Annual statements (2018). Retrieved from https://www.bvb.ro/infocont/infocont19/PBK_20190502173627_raport-anual-2018.pdf.

[10] Transilvania Bank Annual statements (2018). Retrieved from https://www.bancatransilvania.ro.

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Entrepreneurial Competences in Training Future Romanian Farmers

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Abstract

Since 2014, when the entrepreneurship education became a strategic direction for the EU policies in education, the EU has been providing increasing support to national policymakers in education, to universities and schools, in order to improve their approaches in entrepreneurship education. In 2016, the EntreComp Framework was launched, being not only a landmark for the public authorities but also a tool for analysing the entrepreneurial orientation of various curricula and training standards.

This paper aims to make an analysis of the current Romanian Professional Training Standard, EQF level 4, Agricultural Technician specialization, from the perspective of the EntreComp framework. The intention is to point out the gap between what is already being taught and what should be taught regarding entrepreneurship as a transversal competence and to question the framework's level that the Romanian VET system should aim for through its standard in the above-mentioned specialization.

Keywords: entrepreneurship, education, training standard, farmer, EntreComp.

JEL Classification: L26, A22, I21, Q13

1. Introduction

In Romania there is a mix of needs and strengths supported by data, that makes the professionalization of farmers both a necessity and an opportunity to bring added value in economy. By revising the Professional Training Standard for Technician in agriculture specialization, we can train not only good technicians, but also potential successful farmers with strong entrepreneurial mindset and abilities who will balance

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the aging among farmers population and who will also capitalize the high agricultural potential of Romania.

This paper aims to make an analysis of the current Professional Training Standard for Technician in agriculture specialization, from the perspective of the Entrepreneurial Competences framework, to bridge the gap of entrepreneurial skills in farmers training.

2. Problem Statement

Between 2007 and 2018, Romania's total cereal production increased 4.5 times, from 7.81 million tonnes in 2007, to 31.55 million tonnes in 2018, leading Romania to 3rd place in the EU for production cereals. In 2019, production of cereals was 30.3 million tonnes, 1.2 million lower than in 2018 (Eurostat, 2019).

These results – the annual production of cereals - are well below the agricultural potential of Romania which is of approximately 97.3 million tonnes of cereals/year. (PWC, 2017).

Among the factors that determine the non-valuation of the agricultural potential of Romania are:

- the small size of agricultural holdings (farms) – 75% of the farms are less than 2 hectares;
- the aging of the population employed in agriculture;
- the lack of theoretical and practical training in agriculture of farmers;
- the lack of investments in modern technologies (Lăcătușu, G., 2019).

In 2017, 25% of the country's active population was engaged in agriculture, but the productivity of agriculture was 83% lower than the EU average. The cause: 70% of the farms are in fact semi-subsistence farms, each having an income of less than 2,000 EUR / year (Eurostat, 2020). The cause of semi-subsistence agriculture: less than 3% of Romanian farmers are qualified in the field of agriculture (Eurostat, 2019).

Another threatening trend in agriculture is aging. At EU level, 31% of all farmers are over 65 years old, and 45% of them come from Romania (Eurostat, 2019).

Thus, in order to capitalize on the agricultural potential of the country and to counteract the effects of aging of the active population employed in agriculture, in Romania special attention must be paid to the training of future farmers.

Taking care not only of the technical skills of the future farmers, but also considering their entrepreneurial skills as key factors of success, will ensure the long-term growth of the Romanian agriculture.

Entrepreneurial farmers are innovative and shape markets rather than being governed by them. The forerunner farmers can create new markets and implement competitive strategies: they can operate as processors to enhance local markets, collaborate with livestock farms, operate as suppliers and develop their own usage (Suvanto et al., 2020).

At this moment, there is no analysis of the professional training standards from the field of agriculture, telling whether high school graduates are equipped with the best mix of entrepreneurial competences which will make them not only good

technicians in agriculture, but also potential successful farmers, running their businesses in agriculture.

Most of the young people being qualified in agriculture study in one of the 58 agricultural Romanian high schools. Their training in agriculture is based on the Professional Training Standard for Technician in agriculture specialization, EQF level 4, approved through OMENCS nr. 4121/13.06.2016

The Standard consists of 12 Learning Results Units. For each Learning Results Unit, the standard:

- describes the technical learning results in terms of knowledge (to know), abilities (to do) and attitudes (to be);
- describes non-technical learning results, related to each of the 8 Key Competences (EC, 2006), where entrepreneurial competences represent one of the eight;
- presents a list of learning resources needed to obtain the learning results;
- presents the assessment standard and evaluation criteria to measure the learning results obtained by the students.

Before 2010, much of the work done on entrepreneurial skills was related to the European research project Entrepreneurial Skills of Farmers (ESoF). The ESoF project explored the area and identified three essential entrepreneurial skills, namely: 1) recognising and realising business opportunities, 2) developing and evaluating a business strategy and 3) networking and utilising contacts (Wolf and Schoorlemmer, 2007). These entrepreneurial skills were presented as so called 'higher order skills'. While professional and management skills are basic requirements for farmers, the three entrepreneurial skills were found to be essential to create and develop new business activities (Wolf and Schoorlemmer, 2007).

As a more recent initiative in the field of entrepreneurship education, the European Commission developed Entrepreneurship Competence Framework, also known as EntreComp, which is a tool designed to empower the entrepreneurial capabilities of European organizations and citizens. The framework aims to build consensus around a common understanding of entrepreneurship as a competence. It does this by defining 3 competence areas, 15 competences, learning outcomes and proficiency levels, which current and future initiatives, like ours, can refer to (EU, 2016).

EntreComp could be considered as additional support provided by the EU to private actors and public authorities in order to improve their mentoring, training and guidance services for job seekers and young people, and at the same time further an entrepreneurial mindset among citizens (EU, 2016).

The framework's conceptual model consists of two main dimensions: the 3 competence areas: Ideas & Opportunities, Resources and Into Action, and the 15 competencies.

The way the 3 area are interconnected reflects the definition of entrepreneurship. They became part of the framework aimed to emphasize that the entrepreneurship competence is the ability to transform ideas and opportunities into action by mobilising and using resources.

Each of the 15 competencies is named and briefly explained through descriptors. Each competence is split in 3 up to 6 threads and then each thread explained and detailed on the 8th levels of proficiency resulting in 442 learning outcomes (Dumitrache et al., 2018). The framework describes entrepreneurship as a broader transversal competence, not limited to business.

3. Research Questions/Aims of the research

This paper aims to make an analysis of the current Professional Training Standard for Technician in agriculture specialization, from the perspective of the EntreComp framework, through a comparative method:

- to point out the gap of entrepreneurial skills in farmers training and what should be taught regarding entrepreneurship as a transversal competence;
- to question the framework's level that the standard should aim for in the case of the above-mentioned specialization.

This Professional Training standard is used by all the VET teachers from the agricultural schools when designing new curriculum or adapting an existing one.

Through this study, by bridging the gap between the Standard and EntreComp, we might support the entire agricultural education system to adapt the curriculum and make their students not only good technicians in agriculture, but also potential successful farmers due to their strong entrepreneurial mindset and abilities.

4. Research Methods

Aiming to describe the Professional Training Standard for Technician in agriculture specialization and to compare it with the EntreComp framework, we used two widespread research methods: document analysis and comparative analysis. We preferred these methods because:

- They are efficient: they require data selection, instead of data collection, so they are less time-consuming;
- They are cost-effective as they are less time-consuming, comparing to any other quantitative methods;
- Many documents are available in the public domain, especially on the Internet, and are obtainable without the authors' permission (Bowen, 2009).

The Professional Training Standard for Technician in agriculture specialization was developed by the National Centre for TVET Development under the Ministry of National Education and Scientific Research through a European Social Fund Project called "Revised curriculum in TVET". The Standard was elaborated by a working group of 12 VET teachers of agriculture, under the coordination of two curriculum experts. The Professional Training Standard was approved through OMENCS no. 4121/13.06.2016 and it is in force since 2016.

The Standard characterizes the Technician in agriculture as follows: The Technician in agriculture carries out his/her activity under the direct coordination of an agronomist engineer, dealing with: planning, organizing and carrying out the agricultural works necessary for the growth and harvesting of different types of

field crops for the purpose of selling or delivering regularly to buyers or specialized organizations, or in markets.

The standard creates the framework in which students acquire technical and specialized knowledge regarding the technologies of plant cultivation, skills of planning and organizing production and work, coordination of activities, quality control of works and products in agricultural farms.

The 12 Learning Results Units are the following: 1) Using agropedological elements, 2) Animal husbandry, 3) The use of agricultural and livestock machinery, 4) Market related activities of the farm, 5) Farm management, 6) Environmental protection, 7) Driving tractor and car, 8) Plants protection, 9) Organizing the field plant cultivation works, 10) Organizing the horticulture plant works, 11) Animal husbandry and feed production, 12) Organization of mechanization works from the agricultural exploitation.

Each learning result is coded under a 3 digits code, as following: x.y.z where x is the number of the learning results unit, y is the type of result (1 is for knowledge, 2 is for abilities, 3 is for attitudes) and z is counting the number of results of a kind under a specific learning results unit. For example, 2.2.10 Daily control of animals' health is 10th in the list of abilities under the learning results unit number 2, Animal husbandry, and 11.3.3 Collaborating with team members for planning animal breeding correctly is 3rd in the list of attitudes under the learning results unit number 11, Animal husbandry and feed production.

For the purpose of the analysis, only the codes in the column 4 of the table 1 were used.

Table 1. Professional Training Standard analysis

Competences of EntreComp Framework (EU, 2016)			**Level of each competency in the Profesional Training Standard according to EntreComp Framewotk**
Area	**Competences**	**Hints**	
1. Ideas and opportunities	1.1 Spotting opportunities	Use your imagination and abilities to identify opportunities for creating value	5.2.15 – L2 – Uncover needs 5.2.16 - L2 – Uncover needs
	1.2 Creativity	Develop creative and purposeful ideas	5.3.4 – L2 – Design value 5.2.31 – L5 – Be curios and open
	1.3 Vision	Work towards your vision of the future	N/A
	1.4 Valuing ideas	Make the most of ideas and opportunities	N/A
	1.5 Ethical and sustainable thinking	Assess the consequences and impact of ideas, opportunities and actions	6.2.7-20 – L4 – Think sustainably

Competences of EntreComp Framework (EU, 2016)			**Level of each competency in the Profesional Training Standard according to EntreComp Framewotk**
Area	**Competences**	**Hints**	
2. Resources	2.1 Self-awareness and self-efficacy	Believe in yourself and keep developing	N/A
	2.2 Motivation and perseverance	Stay focused and don't give up	N/A
	2.3 Mobilizing resources	Gather and manage the resources you need	4.1.3 – L1 – Manage resources 4.2.4 – L1 - Manage resources 11.2.16, 20, 21 – L5 Manage resources
	2.4 Financial and economic literacy	Develop financial and economic know how	4.1.5, 6, 7 - L1 - Understanding economic and financial concepts 4.2.6 – L3 – Budget 4.1.7 – L1 – Find funding 4.2.7, 8, 5.2.11 - L2 - Understanding economic and financial concepts 5.2.18, 19, 20, 21 - L4 - Find funding 5.2.30 – L6 – Understanding economic and financial concepts
	2.5 Mobilizing others	Inspire, enthuse and get others on board	1.3.d, 2.3.d, …, 6.3.d – L1 - Communicate effectively
3. Into action	3.1 Taking the initiative	Go for it	1.3.a, 2.3.a, 3.3.a, 6.3.a - L2 – Work independently 1.3.b, 2.3.b, 4.3.b, 6.3.b, 7.3.b, …, 12.3.b - L2 – Take responsibility
	3.2 Planning and management	Prioritize, organize and follow-up	2.3.21, 3.3.10, 4.3.6, 5.3.3, 12.3.12 - L1 - Monitoring your progress 1.2.45, 6.2.38, …, 11.2.35 - L1 - Monitoring your progress 11.2.16 – L1 – Plan and organize
	3.3 Coping with uncertainty	Make decisions dealing with uncertainty, ambiguity and risk	2.3.17 – L2 – Calculate risk
	3.4 Working with others	Team up, collaborate and network	1.3.c, 2.3.c, 4.3.c, 5.3.c, 6.3.c, 8.3.c, …, 12.3.c - L2 – Work together 9.2.7, 12, 23, 33 – L5 – Team up 10.2.11, 14, 15, 18, 20, 25, 30, 35 – L4 – Work together 11.2.7, 35 – L5 – Team up
	3.5 Learning through experience	Learn by doing	N/A

Source: the author

Synthetic description of Table 1 (table heading as in Dumitrache et al., 2018):

- Column 1 – area of the EntreComp Framework;
- Column 2 – competence as in EntreComp Framework;
- Column 3 – hint about the competence as in EntreComp Framework;
- Column 4 – competences from the Professional Training Standard, related to the Entrepreneurship Competences and their level according to EntreComp.

Other notations:

- x.3.a describes various competences (attitudes) of working independently when performing different tasks related to the field of agriculture;
- x.3.b describes various competences (attitudes) of taking the responsibility over a specific task related to the field of agriculture;
- x.3.c describes various competences (attitudes) of working together with others for carrying out different tasks specific to agriculture;
- x.3.d describes various competences (attitudes) of communicating effectively within the team.

By analysing column 4, we can estimate the extent in which the Professional Training Standard covers each of the 15 entrepreneurship competences. As table 1 shows, a thread of an entrepreneurial competence can be covered at different levels by multiple competences from the Professional Training Standard. For example, the thread called Monitoring your progress, associated with Planning and management, is covered by one competence from each learning results unit (1-12) up to Proficiency Level 1 (L1).

All these competences can be found under multiple learning results units.

5. Findings

Below there is an analysis of table 1, telling the extent to which the Professional Training Standard covers each of the 15 entrepreneurship competences of the EntreComp.

The first entrepreneurial competence, called *Spotting Opportunities*, is covered by the Standard in 1 out of 5 threads: *Uncover needs* (L2). The 4 uncovered threads are *Identify, create and seize opportunities*, Focus on challenges, *Analyse the context*.

The second entrepreneurial competence, called Creativity, is covered by Standard in 2 out of 5 threads. The 2 covered threads are *Be curious and open* (L?) and *Design value* (L?). The 3 uncovered threads are: *Develop ideas, Define problems, Be innovative.*

The third entrepreneurial competence, called *Vision*, is totally uncovered by the Standard, in all its 3 threads: *Imagine, Think strategically* and *Guide action*.

The fourth entrepreneurial competence, called Valuing ideas, is totally uncovered by the Standard, in both of its threads: *Recognise the value of ideas* and *Share and protect ideas*.

The fifth entrepreneurial competence, called Ethical and sustainable thinking, is covered by the standard in 1 out of its 4 threads, *Think sustainably*, up to L4. The 3 uncovered threads are *Behave ethically, Assess impact* and *Be accountable.*

The sixth entrepreneurial competence, called Self-awareness and self-efficacy, is totally uncovered by the Standard, in all its 4 threads: *Follow your aspirations*, *Identify your strengths and weaknesses*, *Believe in your ability* and *Shape your future*.

The seventh entrepreneurial competence, called Motivation and perseverance, is totally uncovered by the Standard, in all its 5 threads: Stay driven, Be determined, Focus on what keeps you motivated, Be resilient and Don't give up.

The eight entrepreneurial competence, called *Mobilising resources*, is covered by the Standard in 1 out if its 4 threads, *Manage resources*, up to L5. The 3 uncovered threads are *Use resources responsibly, make the most out of your time* and *Get support.*

The ninth entrepreneurial competence, called *Financial and economic literacy*, is covered by the standard in 3 out of its 4 threads, as following: *Understanding economic and financial concepts* up to L6, *Budget* up to L3, *Find funding* up to L4. The uncovered thread is *Understand taxation.*

The tenth entrepreneurial competence, called *Mobilising others*, in 1 of its 4 threads, *Communicate effectively* up to L1. The 3 uncovered threads are *Inspire and get inspired, Persuade* and *Use media effectively.*

The eleventh entrepreneurial competence, called *Take the initiative*, is covered in 2 of its 3 threads, as follows: *Take responsibility* up to L2 and *Work independently* up to L2. The uncovered thread is called *Take action*.

The twelfth entrepreneurial competence, called *Planning and management* is covered by the Standard in 2 out of its 6 threads: *Plan and organize* up to L1 and *Monitor your progress* up to L1. The uncovered threads are *Define goals, Develop sustainable business plans, Define priorities* and *Be flexible and adapt to changes*.

The thirteenth entrepreneurial competence, called *Coping with uncertainty, ambiguity and risk*, is covered by the Standard in 1 of its 3 threads, *Calculate risk* up to L2. The two uncovered threads are *Cope with uncertainty and ambiguity* and *manage risk.*

The fourteenth entrepreneurial competence, called *Work with others*, is covered by the Standard in 2 of its 6 threads: *Work together* up to L4 and *Team up* up to L5. The 4 uncovered threads are *Accept diversity, Develop emotional intelligence, Listen actively* and *Expand your network.*

The fifteenth entrepreneurial competence, called *Learning through experience*, is totally uncovered by the Standard, in all its 3 threads: *Reflect, Learn to learn* and *Learn from experience.*

Overall, out of the 15 competences of EntreComp, 5 have 2 or more threads covered, 5 have only one thread covered and other 5 are not covered at all by the Standard. We can say that the graduates of *Technician in agriculture* specialization are rather not entrepreneurial. The entrepreneurial skills that they are equipped with at the end of the 4 years training program are rather not enough for empowering them to start a business in agriculture. Further revision of the Standard, based on this analysis, is recommended.

6. Conclusions

The research shows that Professional Training Standard for Technician in agriculture specialization covers only 10 out of 15 entrepreneurial competencies described by the Entrepreneurship Competences Framework. The 5 uncovered competences could be covered by revising the Standard, as data shows that the need for farmers with entrepreneurial skills is high in Romania.

Further research having a similar purpose may target Professional Training Standards of other specializations from the field of agriculture.

Further research could also be focused on the effectiveness of the learning content and the methods used in various teaching subjects, as well as on new approaches to increase the effectiveness of the entrepreneurial learning.

References

[1] Annex 4 to OMENCS nr. 4121/13.06.2016, Standard de Pregătire Profesională, Calificarea profesională: Tehnician în agricultură.

[2] Bowen, G. (2009). Document Analysis as a Qualitative Research Method, *Qualitative Research Journal*, 9(2), pp. 27-40.

[3] Dumitrache, V. et al. (2018). Entrepreneurial competences in economical engineering curriculum in Romania, *Social and Behavioral Sciences*, 238, pp. 737-742.

[4] European Commission, Joint Research Centre (2015). Entrepreneurship Competence: An Overview of Existing Concepts, Policies and Initiatives.

[5] European Commission (2006). The Education & Training 2010 Work Program.

[6] European Union, Joint Research Centre (2016). EntreComp: The Entrepreneurship Competence Framework.

[7] Eurostat (2019). Agricultural production – crops. *Report*.

[8] Eurostat (2019). Agriculture statistics – family farming in the EU. *Report*.

[9] Lăcătușu, G. (2019). Progrese în agricultură. *Report*.

[10] PWC (2017). Potențialul dezvoltării sectorului agricol din România. *Report*.

[11] Suvanto, H. et al. (2020). Entrepreneurial identity and farmers' protein crop cultivation choices, *Journal of Rural Studies*.

[12] de Wolf, P., & Schoorlemmer, H. (2007). Exploring the significance of entrepreneurship in agriculture. Report, *Research Institute of Organic Agriculture*, Frick, Switzerland.

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Transforming the Organization … Towards Resilient Businesses within the 4th Industrial Revolution

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Abstract

A variety of situations and unexpected developments are challenging societies all over the world. At individual level, people often have the feeling that things are 'going crazy' or that they - regardless of their roles in their organization, profession, industry etc. - are unprepared and 'taken by surprise' by the elements that interrupt their regular activities, plans and/or scenarios. These disturbances, shocks or rhythm breaks − bigger or smaller − are commonly approached under the term of 'disruption'!

In such a context, change becomes essential for survival. However, individuals do not just want to survive, but to thrive and/or to achieve their goals, to be successful. Thus, any 'disruption' needs to be perceived as an opportunity! Any professional individual and any organization that will not be able to adapt to the new realities of the 21st century, might be set to fail during the 4th Industrial Revolution (4IR). Every individual and every organization should be able/prepared to change, even if, generally, reluctance to change is very high., Based on a comprehensive desk research, in this paper we will analyse a series of new business models for the future of businesses. We aim to provide a clear image on the resistance to change, approached as an 'immune system' of any organization, especially in the context of the 4IR. We will tackle organizational transformation in a pragmatic way, emphasizing the importance of the 'immune system', focusing in the same time, on key people and organizational culture transformation. The paper brings an innovative approach on businesses' flexibility and adaptability to the new challenges and opportunities generated by the 4IR, adding value to the broad scientific literature in the area of entrepreneurship and, in a more specific way, in the area of change management.

Keywords: business, entrepreneurship, 4th industrial revolution, transformation, resistance to change.

JEL Classification: M10, M14

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1. Introduction

In the world of business, performance is the key. In a changing environment, in the future of business, if businesspeople – owners, managers, entrepreneurs, intrapreneurs or any kind of decision makers – target sustainability in their actions, they should focus on new business models and new approaches.

Business owners and business managers, either in entrepreneurial start-ups or big corporations, should change the way they organize and manage their assets, resources, people and priorities.

In this paper we will analyse a series of new business models for the future of businesses, after setting-up their related context. Then, we focus on the resistance to change, approached as an 'immune system' of any organization, especially in the context of the 4th Industrial Revolution (IR). We will tackle organizational transformation in a pragmatic way, emphasizing the importance of the 'immune system', focusing at the same time on key people and organizational culture transformation. Thus, the paper is structured into six main parts, introduction and conclusions included. The following section outlines the context associated with the emergence of our idea. The third and fourth sections briefly explain the research's methodological aspects, while the fifth puts forwards its findings.

2. Problem Statement

The fact that technology is disrupting the world is commonly agreed. Throughout history, people developed different types of technology. Depending on the era and century, the technology developed and used by humans was not of the same shape and size as today, but people became used to it and, after a while, even dependent of the technology of their time. In any society, in the daily life or in the economic and business life, people have used the available technology to make their lives easier. And, some of the most innovative minds of their time tried and succeeded to improve, perfect and upgrade the available technology. From time to time, some inventors and innovators pushed the human technology to the next level. In different times in history, some technology advancements and new inventions had a huge impact on some industries and even on the human society. The disruption and changes brought about by them were so important that they went down in history as IRs. Right now, as many scholars agree, we are at the beginning of the 4 IR, commonly found under the term of Industry 4.0. (Hermann et al., 2016) However, in order to understand the actual context we are placed in, a brief overview of the three previous IR is provided in the following paragraphs.

2.1. The 1st IR

This is actually The Industrial Revolution (about 1760 to sometime between 1820 and 1840), represented by the transition from hand production methods to machines, by new manufacturing and production processes, by the increased use of steam power and waterpower, by the development of machine tools and by the development of the mechanized factory system (Hobsbawm, 1988).

The biggest change (the disruptive change) was produced by mechanization. This represented a main argument in supporting industry, instead of agriculture, as the backbone of the economy in societies.

The disruptive technological innovation defining the 1st IR was the invention of the steam engine. This led to the fast development of railroads, accelerating the economy growth and the development of many businesses.

Economic historians agree that the 1st IR was the most important event in the history of humanity since the domestication of animals and plants, leading also to an unprecedented population growth (McCloskey, 2004).

2.2. The 2nd IR

Also known as the Technological Revolution, the 2nd IR "was a phase of rapid standardization and industrialization from the late 19th century into the early 20th century" (Muntone, 2013). Characterised by "massive technological advancements in the field of industries that helped the emergence of new sources of energy: electricity, gas, and oil", its most important outcome was the "creation of the internal combustion engine that started to reach its full potential" (Anderson, 2019). Other key points are represented by: the development of steel and new methods of communication such as the telegraph and the telephone. One of the emblematic business models in the 2nd IR was the FORD assembly line – maybe, the most iconic element of mass production. In present times, the 2nd IR may be perceived as probably the most important IR due to its most used inventions: the automobile and the plane.

2.3. The 3rd IR

The second half of the 20th century is marked by the emergences of a new source of energy: the nuclear energy. Also, the increasingly fast development of electronics, telecommunications and, maybe the most important, the computers, represent important milestones within the 3rd IR (Khan, 1987). Through new technologies, the 3rd IR opened the doors to space expeditions, research, and biotechnology. In the business world, the development of robots and automated machines led to the era of high-level automation.

The disruptive and fundamental economic change occurred when new communication technologies converged with new energy sources, as the renewable electricity (McCloskey, 2004).

3. Research Questions/Aims of the research

As outlined in the previous section of the paper, three main factors arise as drivers of the 1st, 2nd, and 3rd IRs: *a new energy source, a new communication system* and *a new financial system* (de Vasconcelos, 2015). Starting from this premise, we are aiming to:

- Identify if these factors can also be tracked at the beginning of the 4th IR;
- Analyse what are the disruptive changes and new technologies driving the 4th IR;
- Analyse what are the proper business models and approaches for the future.

In such a context, when resistance to change in organizations is approached using the 'immune system' syntagma (Gilley et al., 2009; Ismail et al., 2014), we aim to understand how does this affect organizational transformation?

4. Research Methods

This paper is based on a desk research, mainly consisting in analysing on-line materials – books, documents of representative institutions in the area, scientific and newspaper articles, blogs of economists and businessmen, etc. All the information we gathered was further analysed in a critical and comparative manner. In the following section of the paper, based on an inductive approach, we outline the research's main results.

5. Findings

5.1. The three main factors driving an IR

Within the 1st IR:

- the *new energy source*: represented by the change from wood power to coal power helping the development of the steam powered boats and trains and leading to industrialisation (using machines and fast mass travel opportunities).
- the *new communication system*: represented by the steam-powered printing press. This led to affordable/cheap newspapers and magazines, enabling somehow mass education. This was a great transformation for humanity, after the Gutenberg moment in 1439, respectively the invention of the first printing press (Gutenberg's press enabled the mass production of books, making books accessible for, theoretically, anybody) (Ismail et al., 2014).
- the *new financial system:* represented by the London stock market.

This new financial system strongly supported the development of the new energy sources and the new communication system, while these, in turn, supported the new financial system, leading to hard-to predict synergies.

Within the 2nd IR:

- the *new energy source* was oil replacing coal. Also, electricity was developed which led to the new communication system.
- the *new communication system* was the telegraph, then the telephone. The cities and homes began to be electrified due to Thomas Edison's invention. Furthermore, oil and electricity, inspired Daimler and Benz in Germany to develop the internal combustion engine. Further developments can be seen in highways construction and other forms of transport infrastructure that help people and goods connect.
- the *new financial system*: represented by the "limited liability corporation, which reduced the risks of individuals engaged in entrepreneurial activities." (de Vasconcelos, 2015).

Within the 3rd IR:

- the *new energy source:* the nuclear energy (at the end of the 3rd IR we can observe the beginnings of the solar power really developed in the 4th IR).
- the *new communication system* was the internet after the development of personal computers (PCs) in the '90s, when the desktop PCs became linked for the first time by Tim Berners-Lee's World Wide Web.
- the *new financial system* is less clear and advanced but internet-driven breakthroughs such as crowdfunding and peer-to-peer finance led to a democratisation of finance.

The technological advances and developments in communication, digital systems and computers, started in the 1960s marked the 3rd IR beginnings, enabling new ways to process and share information - the IT era (Schwab, 2017). In many parts of the world, aspects of the 2nd and 3rd IRs are still fully experienced and implemented. More than that, new technologies are in some cases able to "leapfrog" older ones. More people in the world have access to a mobile phone than to basic sanitation. Therefore, it can be argued that the 4th IR is beginning exactly in the same period when the 3rd IR is getting more and more implemented in many organizations across countries and continents.

So, at the beginning of 4th IR:

- the *new energy sources* are the renewable/green energy sources − fuel and energy sources that restore themselves over short periods of time and do not diminish. Such energy sources include the sun, wind, moving water, organic plant and waste material and the earth's heat (geothermal). The most developed and more and more used new form of energy is the solar and photo-voltaic energy.
- the *new communication system* is based on the Social Media revolution, but also on the internet digital communication systems and on the Virtual Reality (VR) and Augmented Reality (AR) technologies and breakthroughs. The faster and more stable Internet – the 5G – will help the faster development of the Internet of Things which will probably drive the next phase of healthcare advances and many other technological innovations.
- the *new financial system* is probably based on the blockchain technology, most simply defined as a decentralized, distributed ledger that records the provenance of a digital asset. Also, the Internet of Things will have an impact on the financial exchanges of the future. And, since we are only at the beginning of the 4th IR, the development of AI, Machine Learning, and Robotics may lead to the more and more debated Universal Basic Income (UBI).

5.2. The 4th IR − disruptive changes and new technologies

The previous IRs liberated humankind from animal power, made mass production possible and brought digitalization to billions of people.

This 4th IR is, however, fundamentally different. It is characterized by "a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human" (Rifkin, 2013).

All these changes, challenges, and disruptions prove that we live in "a time of great promise and great peril" (Schwab, 2017). Billions of people are now connected to digital networks, the efficiency of many organizations is obviously improved and people can now begin to manage their assets in ways that can help regenerate the human natural environment, therefore, humanity has now the potentially to undo the damage of previous industrial revolutions.

However, as Schwab pointed out, "there are also big risks and grave concerns: some organizations might not be able to change and adapt; some governments may not succeed to use and/or to regulate new technologies. That is why, the big changes in the power system of the 21st century society will create important new security risks and inequality between people will probably grow." (Schwab, 2017).

However, the real impact of technology is not the disruption! The world and people have been dealing with that for centuries.

The pace, density, and unpredictability that disruption brings in the beginning of this 4th IR is without precedent and truly amazing. In the 15th century, the Gutenberg printing press changed the world. Today, thanks to computational advances, we have fully 20 such disruptions hitting us all at the same time, including renewable (solar) energy, blockchain, AI & Machine Learning, biotech, autonomous cars, VR & AR, drones, nanotechnology, quantum computing and more. The fact that so many things are happening at once is unique in human history.

5.3. New business models and new approaches for the future of business

For businesses, the disruptions in their external environment are now so many and so big, that the speed of change exceeds the speed at which they can move and adapt. The new technology start-ups are taking advantage of this situation. That's why so many entrepreneurs are trying their luck with innovative ideas and technologies. And that's why technology and internet companies have grown to global corporations faster than ever in history.

In the past, a company had years to figure out how to position itself and how to adapt and react in relatively slow-moving markets. Today, that time frame is down to months as a new breed of start-ups drive new business models and disruption. As an example, witness the pace at which Elon Musk has disrupted cars (TESLA), space (SPACE X) and is now planning to disrupt energy and transportation (Hyperloop).

Traditional business models are based on scarcity: value is derived from selling a product or service that is in limited supply. However, exponential technologies are generating an abundance of everything - from information to energy – so the main challenge is finding new business models that work for abundance. In such a context, below, we briefly outline a series of relevant examples of new Business Models:

- *Product as a service*

A system, primarily based on the Internet of Things related facilities, that allows consumers to buy less and rent more, being based on the idea of servitizing products – respectively, to sell solutions to clients rather than tangible goods – instead of having just one-time sell. One relevant example is Uber. As users call on only when they need a car, this can leverage an abundance of both drivers and clients to provide

its service. Furthermore, as perceived by many businesspeople, this, somehow, revolutionized the way people, especially young adults, perceive car ownership. Another example is represented by the way in which Philips conceived this business model. Schiphol Airport in Amsterdam, the Netherlands, fully takes advantage of this opportunity since 2015. Even if the lamps (very expensive ones) which provide light in the airport belong to Philips, which is in charge with their permanent maintenance and with the insurance of their proper operation, while the airport benefits of their light by paying for the energy used to light it.

- *Multi-sided platforms*

Online software connects and automates the processes between consumers and producers. A relevant, highly known example is represented by Airbnb. Individuals lease homes or rooms they are not using. Airbnb can leverage an abundance of places to rent, and it became already the biggest hotel chain in the world, without owning any rooms. Another example might be represented by the 99designs, that is an online graphic design marketplace that allows someone looking for a design (e.g., a logo) to post a request and have designers compete for the job. 99designs accesses an abundance of designers to offer its clients a wide range of designs.

- *Ecosystems*

Beyond platforms, ecosystems connect different services and solutions to offer comprehensive value to the members of the ecosystem. Recently, emerging ecosystems have been extending the platform model. Successful global companies are building their own ecosystems, within which a number of companies exist. Not all of these companies have clear business models, but all contribute value to the ecosystem. For example, Google built its own ecosystem by creating entities such as Gmail, Google Maps and Google Drive, while Facebook built its ecosystem by buying entities such as Instagram, WhatsApp and Oculus.

The real challenge is to discover the right business model for a certain organization. Or, even more difficult, the right shape and configuration of the ecosystem for a given business.

5.4. Resistance to Change − as an 'immune system' of the organization

The problem in the businesses existing today is not a lack of disruptive idea – as we previously explained; there are a lot of those. The real problem is that, if and when, someone may attempt disruptive innovation inside a traditional business, the organizational/corporate immune system will react and probably attack the innovators and disruptors. But, before continuing with the 'immune system' concept it is worth explaining it: "An organization's immune system, like the human immune system, protects against change (intrusions) by erecting a powerful barrier. The organizational immune system is comprised of the people, policies, procedures, processes, and culture it creates to prevent change, regardless of the consequences." (Gilley et al., 2009).

Even if the top management or owners of an organization have already decided upon the new business model that their organization should implement to adapt and become more resilient, it might be argued that picking the right business model (not

an easy task) may prove to be the easiest part. The challenge they will inevitably face will be that any time a large organization attempts to innovate or transform itself, the organizational (corporate) immune system might attack. The corporate immune system does its job for a good reason: established organizations usually have a working business and functioning processes, which are important to maintain. However, the immune system should not be perceived as the 'bad character of the story'. Therefore, the goal should not be to destroy the immune system, but to manage it.

The ways in which an organization introduces innovation tends to magnify the immune system problem. Organizations often ask external consultants what needs to be done in order to achieve transformation. Or they invest in or buy external start-ups. Either way, the organization's immune system might attack, usually because the corporate immune system reacts to whatever it considers 'foreign DNA'. Transforming an organization is not only about the organization itself, but also about updating the mindset and knowledge base of the people who work for it.

6. Conclusions

Societies are at the beginning of the 4th IR: an inflection point where the human experience is digitized and augmented with technology. This digitization is accelerating change. The question and the challenge for the future is *How can individuals, businesses, and society, more generally, navigate it!?*

Five hundred years ago, Johannes Gutenberg's printing press freed information as never before. The current pace of technology is bringing a dozen Gutenberg moments all at the same time.

Any organization built in the last century might not be able to survive the 4th IR if it fails to adapt. Therefore, organizational transformation is essential not for thriving but for surviving in the 21st century.

Any established organization may want to transform its business model to connect with abundance by becoming a platform, creating their own ecosystem or choosing another abundance-based business model.

Today's business executives (business owners, entrepreneurs or corporate decisions makers) face challenges by doing a couple of things simultaneously: find new ideas that can develop, grow, and adapt their company and suppress the immune system response of their organizations

Finding new ideas is not easy, but the harder task lays in the prevention of the immune system of their organization to attack the innovative ideas and disruptions.

In order for the organizational transformation to be successful, key employees should be heavily involved in the transformation process. They should learn new concepts, practice by using the new tools and generate their own transformation ideas. The new environment and changes will occasionally prove uncomfortable, so the leadership team must offer the employees their full support.

As a final conclusion, considering all the previously outlined information, in order to transform the organization within the 4th IR, business owners and decision makers should be oriented towards: discovering the right new abundance-based

business model; managing or neutralizing the corporate immune system; supporting people in their transformation experience; supporting intrapreneurship and a learning by doing culture.

References

[1] Anderson, A. (2019). *Virtual Reality, Augmented Reality and Artificial Intelligence in Special Education*. S.l: Routledge.

[2] de Vasconcelos, G. (2015). *The Third Industrial Revolution - Internet, Energy And A New Financial System.* Retrieved from: https://www.forbes.com/sites/goncalodevasconcelos/2015/03/04/the-third-industrial-revolution-internet-energy-and-a-new-financial-system/#7160bb99271a.

[3] Gilley, A., Godek, M., & Gilley, J. W. (2009). The University Immune System: Overcoming Resistance to Change. *Contemporary Issues In Education Research*, 2(3), pp. 1-6.

[4] Hermann, M., Pentek, T., & Otto, B. (2016). *Design Principles for Industrie 4.0 Scenarios.* Retrieved from https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7427673.

[5] Hobsbawm, E. (1988) *The Age of Revolution: Europe 1789-1848.* S.l: Weidenfeld & Nicolson Ltd.

[6] Ismail, S., Malone, M. S., & van Geest, Y. (2014). *Exponential Organizations: Why new organizations are ten times better, faster, and cheaper than yours (and what to do about it).* S.l: Frost & Sullivan's.

[7] Khan, R. N. (1987). The Third Industrial Revolution: an economic overview. *The Third industrial revolution − Impact of science on society*, (146), pp. 115-122.

[8] McCloskey, D. (2004). Review of The Cambridge Economic History of Modern Britain, *Times Higher Education Supplement.* Retrieved from https://www.deirdremccloskey.com/articles/floud.php.

[9] Muntone, S. (2013). *Second Industrial Revolution.* Retrieved from: www.education.com.

[10] Rifkin, J. (2013). *The Third Industrial Revolution; How Lateral Power is Transforming Energy, the Economy, and the World*. s.l: Palgrave MacMillan.

[11] Schwab, K. (2017). *The Fourth Industrial Revolution*. S.l: Penguin Books Limited.

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Impact of Coronavirus Pandemic on Small Businesses in Romania

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Abstract

One of the biggest characteristics of entrepreneurs is seeking opportunities during hard times. One of these moments happened during Coronavirus pandemic, as most of the plans and strategies of the entrepreneurs were quickly changed. The industry status changed overnight and the Government imposed rules that affected everyone's daily activity. In order to survive, most entrepreneurs had to find gaps in the marketplace or rely on their savings and/or Government assistance. Besides that, all entrepreneurs are facing now the question of how to manage in the new business environment and furthermore how to sustain the business.

The purpose of this article is to find out the impact the Coronavirus and the restrictions the Government imposed had on the strategy of small businesses in Romania. Also, we need to discover if they managed to get new opportunities for their businesses. The main assumption of this research is that the Coronavirus pandemic helped most of the entrepreneurs to change their strategy and take some steps that they would normally have taken in a couple of years. As a research method, we used the questionnaire survey method using closed-ended and open-ended questions to help us get a better understanding of the situation. The survey includes aspects like the management of human resources, the adaptability to the new situation, the financial situation and the new strategy of the business. The results of this researching project are thought to lay the foundation for a future study, meant to provide entrepreneurs with more comprehensive and useful information.

Keywords: Business Strategy, Small Businesses, Entrepreneurship, Resilience, Coronavirus.

JEL Classification: E22, L21, M10

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1. Introduction

The discovery of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) at the end of 2019 followed by World Health Organization (WHO) declaration that the world is currently facing a pandemic of COVID-19, put the entire globe under shock (WHO, 2020). If we take in consideration the last pandemics declared by WHO, none represented such a significant risk, by doing so many damages worldwide, until now.

The World Economic Forum, in their Global Risk Report 2020, made a top 10 risks in terms of Impact on the Global Economy and the world. Half of them are caused by environment. The 10th risk is "infectious diseases". This report was published on January 15th, 2020 and shortly after this the highly improbable risk appeared as a reality. The results are massively: the entire world turned upside down for many people.

The COVID-19 made most countries to close their frontiers and impose strict movement restrictions and lockdowns. Beyond the human tragedy of COVID-19 pandemic, major economies (both demand and supply) paralyzed and many financial markets experienced a decline. Organisations are facing tough choices regarding their strategy and how to survive these moments as well as dealing with all conflicting information and the steps they should follow in order to minimise the losses (GDA, 2020). All organisations, from entrepreneurs who are doing everything on their own to big corporations, had to adapt to this new situation.

The purpose of this papers is to find out the impact that COVID-19 pandemic had (has) on small companies in Romania. The focus is on small businesses because they are, usually, the first ones affected by the smallest change. Also, we have noticed that the current researches are based more on bigger companies, forgetting about the small ones. The research focuses on their strategy and how they adapted it until now and which are their future plans.

In Romania, the first case of Covid-19 was registered at the end of February. The Romanian government has also announced 14-day quarantine for citizens returning from the affected areas. The situation quickly escalated and on March 8th there a ban on all indoor and outdoor activities involving more than 1,000 people was announced. As from March 9th, all schools were closed and all flights and buses from Italy were suspended. Italy was the first European country badly affected by Covid-19. Moreover, more than 1 million Romanian people live and work in Italy. On March, 14th the state of emergency was declared and on March 24th, a National lockdown was instituted until May 15th. During this time, movement outside the home or household was limited and all non-essential shops were closed, allowing only food shops and pharmacy to be open. A ban was placed on international travel and also the export of certain basic food was prohibited. As for the economy, during the state of emergency and lockdown, the Bucharest Stock Exchange recorded losses in all five trading sessions, and the main index, BET, collapsed by 17.6%, the strongest decrease since December 2018 (Popescu, 2020). Also, on March 16th, BNR (2020) announced a historical maximum for the unique

European currency against the Romanian currency, Leu. In order to support the business environment, the Government announced a series of facilities and financial aids.

After May 15th until this moment, i.e. end of July, Romania continues to be in a state of alert and relaxations measures. Most of the bans were lifted; people can easily travel inside the country and book a hotel. Restaurants and pubs are open only if they can provide an open space and all people must wear masks inside a closed space and in public transport and respect social distancing. Gatherings are still banned and private events can be made with just a limited number of people. The Government is currently preparing a National Investment and Economic Relaunch Plan (Romanian Government, 2020). Regarding the future context, the situation is volatile. The number of cases is following an ascending curve, increasing daily and already surpassing 1,000 cases per day at the time we are writing this article, causing difficulties to travel to other countries (quarantine, submission of a negative test or interdictions).

Business Confidence in Romania increased to -9.80 points in June from -17.40 points in May 2020. At the beginning of January 2020, it was -0.7 points. Business confidence started to decrease since May 2019. When it comes to the ease of doing business, Romania is ranked 55 among 190 economies in 2019. The rank failed to 55 in 2019 from 52 in 2018. These statistics were retrieved from TradingEconomics.com in order to establish the context in which entrepreneurs in Romania are doing businesses.

This is the context all companies from Romania had to face until this moment. It is briefly described and we did not mention the psychological impact that Covid-19 had on the population: impulsive food shopping, anxiety from facing uncertainty, stress, loneliness, fear, negativity, etc. This is also an important factor to take in consideration. But even in the darkest times there is still hope, as other disasters showed us.

This moment makes it interesting and makes it a perfect time to assess how the evolution of COVID-19 pandemic impacted small businesses in Romania, especially since the 2nd semester will be worse (Fernandes, 2020). In this research, we want to find out if there was hope for some small businesses, if they found opportunities and how they managed until now. The pandemic and its effects will be longer and this research makes it a starting point and lays a foundation for a more elaborate future study.

2. Problem Statement

When it comes to the social and economic impact of a pandemic/crisis on small or even larger businesses, Doern (2016), Kuckertz et al. (2020) and Rizvi et al. (2020) noticed that there is scant evidence in entrepreneurship literature. To our best knowledge, we also noticed that. Moreover, this COVID-19 pandemic is different from others by making us face new challenges that create a unique situation (Fernandes, 2020): e.g., some part of production and economic activities were partially or totally interrupted in some countries and Romania makes no

exception. This particularity makes us search about crises management, leadership in crises and resilience.

Grint (2020) made a parallel between COVID-19 and tame/wicked/critical problem framework. We will take it on the next level and use this model to apply it on small businesses strategy and entrepreneurs. Tame problems could be the procedures and operations in a company, wicked problems – asking employees to collaborate and support each other and the company during a crisis and critical problems are the decisions the entrepreneur takes in order to protect the future of the company. But taking decisions during a crisis requires preparation and only a few small businesses would have been prepared for a crisis like COVID-19 pandemic. At the same time, businesses do not always have the ability to recognize the actual threat that a crises event can imply (Kuckertz et al., 2020) and the majority of businesses were taken by surprise by the COVID-19 pandemic.

Entrepreneurs, in order to be prepared, should practice resilience. Resilience is the ability to bounce back when the business is under continuous threat and search for new opportunities and develop new ideas (Rapaccini et al. 2020). Basically, resilience means to reinvent the company so it can face the challenges of the crisis. One of the resilience principles is called the theory of bricolage which means to have the ability to create solutions on the spot using the materials you have on hand (Mallak, 1998). But in order to do that, companies should accumulate experience from previous crises and develop a mind-set which includes anticipation and orientation to solutions and should invest in building resources and networking (Doern, 2016), (Rapaccini et al., 2020). Also, Doern et al., (2018) points out that the way an entrepreneur responds to a crisis depends on various factors which depend on their experience, stage of business development, the way the crises impacts their business and the resources they have to spare and how good they are to be used. Crisis management correlated with resilience is the utter most important during crises and especially COVID-19 pandemic, which is unique.

Most companies found survival in digitalization. A McKinsey (2020a) report shows that adoption of digital sales channels is increasing in both B2C and B2B. An interesting fact is that B2B decision makers believe that digital sales interaction will be almost twice more important than traditional interactions in the next few weeks. Digitalization makes companies less dependent on human interaction and travel. But this process sometimes can require a lot of time and resources and they have impact on the business model of the company (Rapaccini et al., 2020). Still, going digital is different than a measure which is urgently needed to recover from the pandemic. It is a totally new strategy and it has catapulted us 5 years forward (McKinsey, 2020b). But as the economy will recover, we will not know yet if companies will maintain this path, combine it or go back to their initial setup. It is still too early to understand how the new normality will look like. In Romania, at the end of 2019, small businesses which received online orders were just 12% compared to 2018, when they were 7% (Trading Economics, 2020).

According to INS (2020), the tends in economic activities evolution from July to September 2020 are the following: there will be a slightly increase in the

operations of Industries and Trade fields of activities, a slightly increased number of employees in Services (Construction field of activity) and Trade.

3. Research Questions / Aims of the Research

The purpose of this research is to find out the influence the COVID-19 pandemic had on small businesses in Romania during lockdown and the state of alert. The objectives are to notice if they designed new business strategies, how they adapted to this new situation and if they found opportunities for their businesses or not. We also detected some hypotheses:

- COVID-19 pandemic helped most businesses to accelerate their strategy. Normally, it would have taken a couple of years to reach that point.
- Most companies went online and found a way to continue their activity using the Internet.

4. Research Methods

For this research, we used the quantitative method. A survey was created including closed-ended and open-ended questions. Because we wanted to find out which are the most important things for them, most of the questions had a single answer.

The survey was applied in July 2020, between July 13th and 27th. In this time, the number of cases of COVID-19 illnesses exceeded 1,000 people and the state of alert was again prolonged. We divided the survey in 3 parts: before pandemic and general questions, during lockdown (March 16th - May 15th) and after lockdown, during the state of alert (May 15th - present).

The population of the study were small businesses from Romania with maximum 49 employees. The survey was sent to entrepreneurs, networking groups and hubs. The fields of activity were non-agriculture. A number of 47 companies answered to our survey.

A second method of analysis used in the paper is scientific documentation using scholarly literature written in the field.

5. Findings

The entrepreneurs who answered our survey were 17 women and 30 men. The average age was 36.9. 97% of the entrepreneurs have a university degree.

The percentages of companies which answered this survey are from the following fields of activity: 14.9% Industries, 63.8% Services and 21.3% Trade. In 2018, according to INS (2020), there were 7.6% companies from Industries field, 57.89% from Services field and 34.42% from Trade field. Our survey respects the statistics and the trends. Most of the companies (48.7%) operate in Bucharest-Ilfov while the next big development region is South Muntenia (12.8%) and South-East (10.3%). All other regions have less than 10%: South-West, North-West with 6.4% and Centre, North-East and West with 5.1%.

For a better understanding of the results, we divided them in three parts: strategy, employees and sustainability.

A. Strategy

More than a half of the questioned entrepreneurs (53.2%) wanted, at the beginning of 2020, to expand their business at local level. A quarter wanted to expand at national level and 8.5% to internationalise their business and the same percentage to keep it at the same level. There were 4.3% who wanted to expand in other field of activity. We asked what their main strategy was and we took in consideration just one objective. After the lockdown, in July, 55.4% said that they will maintain their strategy but they will make small changes, 34% will switch to other strategy and 10.6% will keep the one they set before the pandemic started.

As highlighted in table 1, small businesses were mostly slightly affected and more than a quarter found new business opportunities (developing a certain product to help people in these times and going online with their businesses). Those who declared that they continued their activity as usual have as main activity business consultancy (legal, engineering, advertising, etc.). There are significant percentages of companies which had a better activity and higher revenue than last year. We could associate this with the resilience the entrepreneur has and the capacity to spot opportunities.

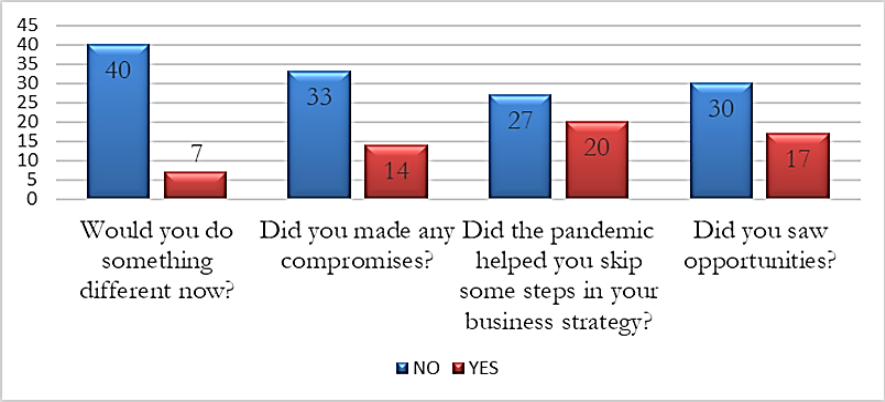
Table 1. Impact of COVID-19 on small businesses in Romania

Impact of COVID-19 on their businesses				
Slightly affected	Extremely affected	Temporary closed	The business went better	
40.46%	25.5%	21.3%	12.74%	
Business activity during lockdown				
Temporary closed	Reduced activity	Found new opportunities	The same	
27.7%	25.5%	36.2%	10.6%	
March – June 2020 Revenue compared with same period 2019				
Decreased max. 25%	Decreased 25-50%	Decreased 50-75%	Decreased >75%	Increased
21.3%	21.3%	23.4%	14.9%	19.1%

Source: Results from the survey applied

Half of the companies did not access any Governmental facilities, 30% asked help to pay the technical unemployment (the employer set its employees at home for the period of time in which it had nothing to give them to work; it paid them a percentage of their salary) and 20% got a discount for paying their fees on time.

Figure 1. Entrepreneurs' behaviour during COVID19 pandemic lockdown



Source: Results from the survey applied

The first five challenges entrepreneurs faced during the lockdown were: the threat regarding the future of the company (26.2%) followed by economic and political instability (25.4%), lack of cash flow (15.1%), barriers in communication with public authorities (8.7%) and challenges related to the entrepreneur's personality and manner of thinking (7.9%).

Figure 1 shows how entrepreneurs behaved during pandemic. Almost all entrepreneurs consider that they did everything they could during lockdown and only 7 will do now things differently: different approach, more research, temporary lockdown of everything, The compromises made by 14 entrepreneurs are: new strategy, lowered prices and mitigated development plans, personnel fired, loans made and expenses cut. More than half did not see any opportunities for their businesses during lockdown and they feel like they regressed. Only 20 companies feel that COVID-19 pandemic helped them skip some steps and all of them moved in online (working and/or selling).

In the future, in order to avoid future risks, 59.6% of the entrepreneurs consider that it is opportunistic to diversify the company's activity. Only 17% want to save money and 12.8% think that planning the company's strategy in the smallest detail will help them avoid future risks. 10.6% of the entrepreneurs' strategy is to do a combination of the above.

B. Employees

As seen in Table 2, entrepreneurs managed employees depending on the period of time. The percentage of working from home was bigger during lockdown and decreased during the state of alert. Technical unemployment was a facility allowed just during lockdown. During the state of alert, the number of entrepreneurs who fired personnel and reduced working hours and salary increased.

We have asked entrepreneurs how many employees they had before and after the COVID-19 pandemic and we noticed that from a total of 47 companies, ~30% fired personnel and 12.76% hired personnel (60% in the Services field of activity and 40% in Trade) after the lockdown.

Table 2. Managing employees during lockdown and state of alert until present

Managing employees during lockdown				
Work from home	Work from office with safety measures	Fired personnel	Reduced working hours and salary	Technical unemployment
53.2%	12.8%	6.4%	2.1%	25.5%
Managing employees during the state of alert – now at end of July 2020				
Work from home	Work from home &Office	Fired personnel & the rest WFH/Office	Reduced working hours and salary	N/A
12.8%	34%	25.5%	27.7%	N/A

Source: Results from the survey applied

C. Sustainability

During lockdown, 63.8% of the companies did not donated but they kept their resources to maintain the salary of their employees helping the community in this way. Companies who donated food and equipment for hospitals were 14.9%; 12.8% donated money. Other companies offered their services to the community. After this experience with the COVID-19 pandemic, 93.6% of the companies consider that it is important to take care of the environment and create a sustainable company. 66% of the entrepreneurs plan to do this by helping their employees to develop professionally, 23.4% using ecological technologies and 10.6% through making the company's activity efficient and by reinvesting.

6. Conclusions

During the COVID-19 pandemic, most small businesses from Romania were slightly affected and lost around 50% of their revenue compared to last year. Also, 30% had to fire personnel and almost the same percentage had to cut working hours and salary. A quarter of the companies declared that they had a better activity and their revenue increased. Almost all companies went online and adapted their activities in order to survive, validating hypothesis 2. Hypothesis 1 is not validated since most entrepreneurs felt that they regressed and only a few felt that this pandemic helped them improve faster. But hypothesis 1 is based on a subjective point of view and depends on how each entrepreneur sees himself.

The limits of the study refer to the methodology we used, that reflects a subjective perception and judgements. We also used most of the questions with a single answer limitation, the entrepreneur's answer. Even though the limits of the study cannot be overlooked, the importance and significance of this research cannot be disputed. It contributes to better understanding the impact that COVID-19 pandemic had on them and the behaviour of entrepreneurs during these times.

References

[1] Doern, R. (2016). Entrepreneurship and crisis management: The experiences of small businesses during the London 2011 riots. Location: *International Small Business Journal*.

[2] Doern, R., Williams, N., & Vorley, T. (2018). Special Issue on Entrepreneurship and Crises: Business as Usual? An Introduction and Review of the Literature. Location: *Taylor and Francis Online*.

[3] Fernandes, N. (2020). Economic effects of coronavirus outbreak (COVID-19) on the world economy. Location: *SSRN*.

[4] Global Data Analysis (GDA). (2020*). Coronavirus Executive Briefing – Understand the COVID-19 outbreak and its impact on the global economy*. Retrieved from https://www.globaldata.com/covid-19/.

[5] Grint, K. (2020). *Leadership, management and command in the time of the Coronavirus*. Publisher: Sage Pub.

[6] Kuckertz, A., Brandle, L., Gaudig, A., Hinderer, S., Morales Reyes, C. A., Prochotta, A., Steinbrink, K., & Berger, E. (2020). *Startups in times of crisis – A rapid response to the COVID-19 pandemic*. Location: Elsevier Inc.

[7] Mallak, L. (1998). Putting organizational resilience to work. Location: *Industrial Management*.

[8] McKinsey. (2020a). *COVID-19 – Briefing materials. Global Health and Crises response. Updated 6th July*. Retrieved from: https://mck.co/309vWs1.

[9] McKinsey. (2020b). *The COVID-19 recovery will be digital: A plan for the first 90 days*. Retrieved from: https://mck.co/2PaQz0B.

[10] National Institute of Statistics. Retrieved from http://statistici.insse.ro:8077/tempo-online/.

[11] Popescu, L. (2020). *Săptămâna de coşmar pentru bursa românească: prăbuşire de 17,6% [Nighmare week for the Romanian Stock market: it collapsed 17.6%]*. Retrieved from https://bit.ly/2D62lH8.

[12] Rappacini, M., Saccani, N., Kowalkowski, C., Paiola, M., & Adrodegari, F. (2020*).* Navigating disruptive crises through service-led growth: The impact of COVID-19 on Italian manufacturing firms. Location: *Elsevier Inc*.

[13] Rizvi, S., Mirza, N., Naqvi, B., & Rahat, B. (2020). Covid-19 and asset management in EU: a preliminary assessment of performance and investment styles. Location: *Journal of Asset Management.*

[14] Romanian Government (2020). *Planul de Investitii si Relansare Economica*. Retrieved from: https://bit.ly/2Xa7AfO.

[15] Romanian National Bank (BNR). (2020). Retrieved from: https://bit.ly/3hNVWz3.

[16] Trading Economics. (2020). Retrieved from: https://tradingeconomics.com/romania/ indicators.

[17] World Economic Forum. (2020). *The Global Risk Report 2020*, Retrieved from: https://www.weforum.org/reports/the-global-risks-report-2020.

[18] World Health Organization (WHO). (2020). *Rolling updates on coronavirus disease (COVID-19).* Retrieved from https://bit.ly/2P7sMi2.

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Logistics Outsourcing and Service Providers – a Critical Review

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Abstract

Outsourcing of non-core activities has become a common practice of many companies in the world. The main purpose of this process is to allow focus on what a company is doing best. Logistics activities are part of this trend by being outsourced to professional services providers. This generated a whole new industry, with its own specific measures.

In the present paper, the authors will attempt to define the concepts and to investigate the services performed by these players. The types of customer-provider partnerships will be also presented, with the aim to understand what drives a successful collaboration.

The trends of the future also affect the logistics industry, so the authors will analyse how these changes are re-shaping the nature of the players.

Keywords: logistics services providers, outsourcing, performance measures logistics.

JEL Classification: L21, L24, L91

1. Introduction

Logistics activities are part of the global trend of outsourcing no-core activities to professional services providers. According to Ballou (1999), it is estimated that costs related to logistics represent about 12% of the World's GDP. The main beneficiaries of this global trend are the logistics service providers (called hereafter 3PL's) that have emerged in the last period as a standalone and important industry.

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2. Problem Statement

The literature review aims to provide the theoretical background of researched topic. The review has two main objectives:

- Describing the main concepts, from basic to complex;
- Supporting the future research methods;

Based on these objectives, the main chapters of the literature review are:

- Logistics outsourcing – what are specifics of outsourcing in logistics and how it differs versus other outsourcing typologies;
- 3PL's – what are the characteristics of such companies, as chief orchestrators of logistics outsourcing.

3. Research Questions/Aims of the research

The main objective of this paper is to provide a critical review on the literature concerning the logistics outsourcing and 3PL. By analysing these concepts, the author will also address other research questions:

- What are the main services performed by a 3PL?
- How 3PL's differentiate their services in the market?
- What are the main performance measures of a 3PL?

4. Research Methods

The authors have chosen to perform a desk research, based on selected articles dealing with the topic. Most of the articles are from international literature, but there few relevant articles written by Romanian authors were selected.

The analysis aimed at selecting main ideas and trends as depicted in the literature. Therefore, the author has also included older articles, as they provided seminal theories for the researched topics. The review was completed then with newer articles in order to round the research.

5. Findings

The nature of the 3PL cannot be understood before doing an investigation into what outsourcing means. More specifically, one has to understand what outsourcing is, why the companies outsource, what they outsource, to whom etc. In just one sentence, outsourcing comes with the classic dilemma: make or buy.

In a study dedicated to logistics outsourcing in the UK, Rafiq and Jaafar (2005) have explored the nature of outsourcing. Outsourcing is largely regarded as a tool aiming to achieve two main objectives: lowering the costs and gaining competitive advantage.

Murphy and Poist (2000) defined the 3PL as "a relationship between a shipper and third party which, compared with basic services, has more customized offerings, encompasses a broader number of service functions and is characterized by a longer-term, more mutually beneficial relationship".

Such a relationship can start and evolve in two ways:

- Gradually, when the company and the 3PL move upwards from simple to complex services;
- Instantly, where the company decides, mainly due to strategic reasons, to outsource logistics.

Such a vision is depicted also by Large (2007) in the following table:

Table 1. Evolution of logistics partnership

		Asset specificity		
		No	**Medium**	**High**
Frequency	**Occasional**	contract of carriage	forwarding contract	forwarding contract / contract of employment
	Recurrent	contract of carriage / warehousing contract	forwarding contract / cooperation agreement	third-party logistics contract / contract of employment

Source: adapted from Large (2007)

However, there are 3PLs that overrun this scale, by becoming what is called "integrators". It's debatable if they become already 4PLs, since the literature is still challenging this concept. What is certain is the fact that such 3PLs find themselves in a new phase, irrespective of how is defined in the literature. Again, Large (2007) proposes a good classification of 3PLs following their level of integration.

Table 2. Partnership and integration

		Ability of customer adaptation	
		Low	**High**
General ability of problem solving	**High**	Integrators DHL, Fedex, TNT	Third Party Logistics firms
	Low	Standard Transportation firms	Traditional house brokers or warehousing firms

Source: adapted from Large (2007)

As a final remark, it should be noted that it is not necessary to be a global 3PL, like those from above table, in order to be an integrator of logistics services. You can be local, smart and agile and, by this, be the best partner for a global manufacturer.

In an American 3PL survey (Lieb and Bentz, 2008) several CEO's were interviewed. As expected at this level, they were looking more into the future by pointing few trends for the years to come.

As a constant topic, they mentioned the 4PL concept as the next step in logistics. In their opinion, the 4PL is the integrator of the logistics services, acting like a Lead Logistics Provider (LLP). One CEO that participated in the survey said "customers recognize that in many cases one 3PL cannot provide all the capabilities required, so the best way to address this is through an LLP relationship."

In most cases, this notion of 4PL or LLP is also linked with technology and knowledge excellence. Such an integrator should master the new technologies that now emerge in logistics, like RFID or EDI, and be able to provide advice to its customers on new trends, like collaborative forecast.

The evolution of logistics providers can be easily understood using Figure 1:

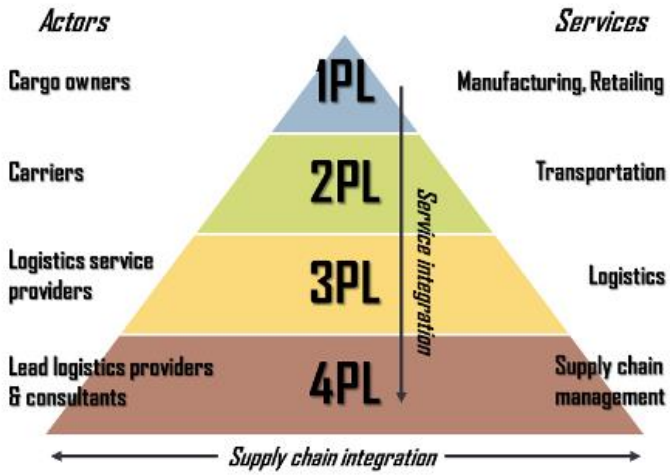

Figure 1. Evolution of logistics providers

Source: authors' own research

Another challenge for the future is the new era of Internet. How the 3PLs will adapt to the web-based environment and continue to provide innovative solutions? Rabinovich and Knemeyer (2006) have studied the internet supply chains and the role of 3PLs in the "New Economy". The authors propose the concept of "hub" as a centre where Internet sellers and buyers meet with one or many 3PLs. These 3PLs have evolved in two categories:

- Physical asset-based 3PLs − heavy users of transportation and inventory/ warehousing assets (traditional 3PLs);
- Information-based 3PLs − providers that chiefly manage information.

The above classification does not exclude that a 3PL can play on both sides, by having both physical assets, and being present on the internet.

In the particular case of Romania, an analysis of the employment of storage spaces reveals that the main tenants are logistics service operators (Țarțavulea and Petrariu, 2013). However, the authors look at the subject from the point of view of the owners, mentioning only as an example a few logistics services providers, without going into details of their mode of operation. It is also worth noting that the market has experienced accelerated development in recent years, which has to be investigated.

6. Conclusions

The main objective of this study was to provide a critical review on the literature concerning the concepts of logistics outsourcing and 3PL. The concepts were analysed separately, but also in a larger and integrative perspective.

The research question addressed the relation between range and quality of services and market winning. It can be said that there is strong connection between range and quality of services and market winning. The companies that have constantly improved their offer manage to acquire a substantial market share.

Since the paper was based only on a literature review, the research has certain limitations. The authors intend to continue the study through case studies on the Romanian market.

References

[1] Ballou, R. H. (1999). *Business Logistics Management*, 4th ed., Prentice Hall, p. 12.

[2] Large, R. (2007). The influence of customer-specific adaptations on the performance of third-party-logistics relationships – document studies and propositions. *International Journal of Logistics: Research and Applications*, 10(2), pp. 123-133.

[3] Lieb, R., Bentz, B. (2005). The Use of Third-Party Logistics Services by Large American Manufacturers: The 2004 Survey, *Transportation Journal*, Spring 2005.

[4] Murphy, P., Poist, R. (2000). Third-Party Logistics: Some User Versus Provider Perspectives. *Journal Of Business Logistics*, 21(1), pp. 121-133.

[5] Rabinovich, E., Knemeyer, M. (2006). Logistics Service Providers in Internet Supply Chains. *California Management Review*, 48(4), pp. 84-108.

[6] Rafiq, M., Jaafar H. (2005). Logistics outsourcing practices in the UK: a survey. *International Journal of Logistics: Research and Applications*, 8(4), pp. 299-312.

[7] Țarțavulea, R. I., Petrariu, R. I. (2013). Logistics market statistics and opinions about the Supply Chain Management in Romania. *Amfiteatru Economic*, 15(33), pp. 180-196.

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Supply Chain Strategy in the Context of Logistics Outsourcing

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Abstract

The concept of strategy is present in the activity of any company in the world. The aim of this article is to analyse these ideas in the context of supply chain and logistics industry. This is especially relevant in the today world, where different kinds of shocks have been affecting global supply chains.

The research will be done by looking at the relevant literature through a top-down approach. Therefore, we will see how we get from the main concept of strategy to the specifics of logistics services industry. Every company has to adapt its own supply chain strategy to be matched with the logistics provider strategy in order to better serve the customers. The success of this integration is very often essential for the success of overall strategy.

In this context, the authors will also define the concept of strategic fit and provide examples of supply chain strategies, associated with performance measures/metrics in logistics and supply chain environment. The current Covid-19 crisis has proven even more that the world is more interconnected: when a negative event affects one region, it spreads quickly and deeply all over the world. Therefore, a good strategy may help the companies to build flexible, yet resilient supply chains.

Keywords: supply chains, logistics, strategy, strategic fit.

JEL Classification: L21, L24, L91

1. Introduction

The logistics industry in Romania is still in its inception compared to Western Europe. However, the Romanian logistics services market has experienced a

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significant growth in the last years. This has generated multiple opportunities for the market players, but also a lot of confusion.

The logistics services providers (called hereafter 3PL's) have to adapt and fit their strategy with their customers. This alignment is not always easy, but it's essential for a successful partnership.

2. Problem Statement

The literature review aims to provide the theoretical background of researched topic. Every functional strategy must evolve from the overall business strategy of the company. This seems like something very easy, but, in many companies, there is a big discrepancy between the vision of the senior leadership team (who drives the business strategy) and the reality and wishes of the functional manager. Therefore, the review has the two main objectives:

- Describing the main concepts, from basic to complex
- Supporting the future research methods

Following these objectives, the literature review features a review of the concepts related to supply chain strategy. The perspective used is based on the principle that the existence of any 3PL come from the strategy of the company that needs to do logistics.

3. Research Questions/Aims of the research

The main objective of this study is to provide a critical review on the literature concerning the concepts of supply chain strategy. By analysing these concepts, the author will address also other research questions:

- Is there any relation between range and quality of services and market winning?
- What is the strategic fit of a 3PL?

4. Research Methods

The authors have chosen to perform a desk research, based on selected articles dealing with the topic. Most of the articles are from international literature, but few relevant articles written by Romanian authors were selected.

The analysis aimed at selecting main ideas and trends as depicted in the literature. Therefore, the authors have included also older articles, as they provided seminal theories for the researched topics. The review was completed then with newer articles in order to round the research.

The study is also an exploratory research, due to the novelty of the topic in Romania. Such a research aims to discover more about the market and develop some conclusions. According to Beal (2002), "an exploratory research can be defined as potentially useful knowledge building in a new area. This research often yields important competitive advantages as new opportunities emerge".

Other authors, like Saunders, Lewis, Thornhill (2007) maintained that "an exploratory study is a valuable means of finding out what's happening; to seek new insights, to ask questions".

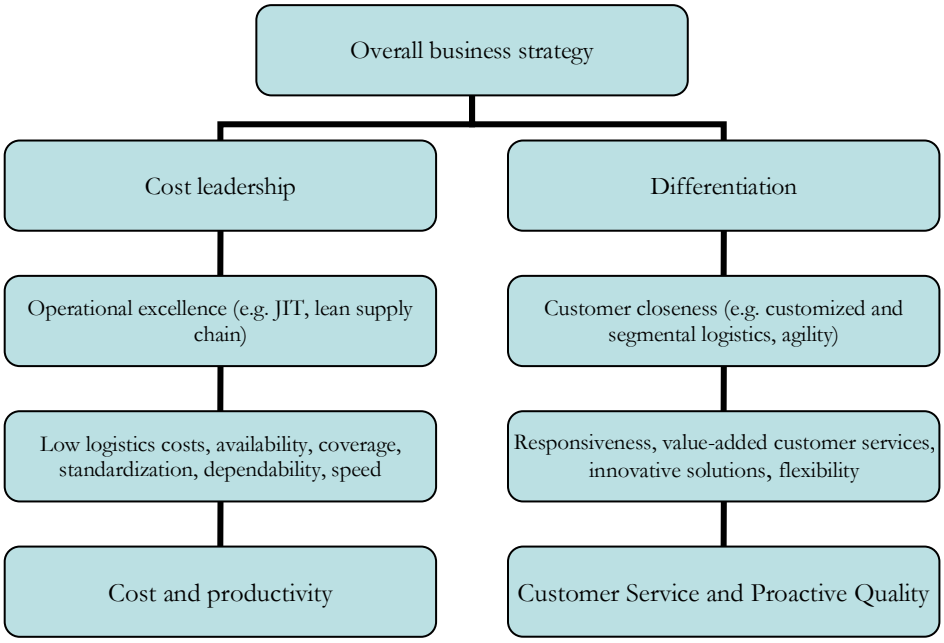
Several keywords were used in the literature review, including "supply chain strategy", "strategic fit", "3PL integration", "logistics kpi's and metrics".

5. Findings

Every functional strategy must evolve from the overall business strategy of the company. This seems like something very easy, but, in many companies, there is a big discrepancy between the vision of the senior leadership team (who drives the business strategy) and the reality and wishes of the functional manager.

Morash (2001) proposes the subsequent model to highlight the relationship between business strategy and supply chain strategy. The author starts from the overall business strategy (level 0), which, according to Porter, are cost leadership or differentiation (level 1). From these generic strategies, two generic supply chain strategies can be derived: operational excellence or customer closeness (level 2). Level 3 shows the supply chain capabilities and combinations needed to achieve the strategies, while level 4 represents the performance criteria to measure the success of the strategy.

Figure 1. From business strategy to supply chain strategy



Source: adapted from Morash (2001)

The studies regarding logistics strategies can be found in the literature starting with as 1987. Bowersox and Daugherty (1987) explain that logistics strategic orientations can be categorized as *process-based, market-based, and information-based.*

This taxonomy remained for many years as the most important and resilient, due to its strong theoretical background and empirical research. However, in the recent years, the Bowersox and Daugherty concept was challenged by many authors.

In large scale survey, Autry, Zacharia & Lamb (2008) interviewed and sent questionnaires to a significant number of companies in the US, regarding to their logistics strategy.

Based on the replies received from the market, the authors propose two main types of strategies. The first cluster is called *Functional Logistics (FL) strategy*, focused mainly on inventory and order management, order processing, procurement and storage. The second cluster is identified as *Externally Oriented Logistics (EOL) strategy*, whereas priorities can be found in coordination and collaboration activities, logistics social responsibility, strategic distribution planning and technology and information systems activities. The areas like customer service, operational controls and transportation management can be found in both clusters.

The next table pictures a snapshot of both orientations:

Table 1. Logistics strategies

Logistics strategy	Description
Strategy 1: Functional Logistics strategy	The primary goal is to achieve maximum logistics efficiency. This is accomplished by focusing on inventory and order management; order processing; and procurement and storage activities, as well as by addressing common functions related to customer service, operational controls, and transportation management.
Strategy 2: Externally Oriented Logistics strategy	The primary goal is to emphasize the ability to respond quickly and efficiently to changing customer needs, outbound delivery, support and services. This is accomplished by focusing on inter-firm Coordination and Collaboration Activities, logistics social responsibility, Strategic Distribution Planning, and by leveraging supply chain technology and Strategy information systems, as well as by addressing common functions related to customer service, operational controls, and transportation management.

Source: adapted fromAutry, Zacharia & Lamb (2008)

This taxonomy is important for two aspects, as regards to outsourcing:

- The company must know or draft a specific strategy
- The service provider selected must share the same orientation

Any strategy requires implementation and follow-up, therefore it needs to assess the performance. Large scale performance reporting systems are used also in logistics.

Gunasekaran and Kobu (2007) analysed the main KPI's used in logistics and supply chain. They maintain that companies use very different approaches with regard to performance management in logistics; consequently, the first difficult task is to summarize them. Therefore, the authors used the main activities done in the supply chain (plan, source, make, deliver) and associate the KPI's with each of these activities. We should note the close link with SCOR model, developed by Supply Chain Council.

Table 2. Key performance measures/metrics in logistics and supply chain environment

Phases in supply chain	**Performance measures/metrics**	
	Financial	**Non-financial**
Plan	Return on investment, selling price	Labour efficiency, perceived value of product, product development cycle time, bidding management cycle time, compliance to regulations, forecasting accuracy, perceived value of product, supply chain response time
Source	Scrap/obsolescence cost, inventory cost, selling price of goods and service	Labour efficiency, product development time, lead time for procurement including supplier development time, delivery reliability, product and service variety
Make	Scrap/obsolescence cost, overhead cost, inventory cost, selling price of goods/services, value added	Labour efficiency, Compliance to specifications, capacity utilization, lead-time for manufacturing, production flexibility, process cycle time, accuracy of scheduling, product and service variety, value added
Deliver	Overhead cost, value added, inventory cost, stock-out cost, transportation cost and warranty cost	Labour efficiency, Delivery reliability, perceived value of product, value added, product and service variety, perceived quality

Source: adapted from Gunasekaran and Kobu (2007)

Gunasekaran and Kobu provided also the complete list of KPI's, but this is too long for the purpose of the research. However, looking at it, the following interesting conclusions can be drawn:

- Non-financial KPI's received due attention in SC systems (65% of the total). Financial KPI's represent only 35% of the KPI, but all of them are related to cost, which still plays a major role in logistics.
- Quantitative KPI's received due attention (85% of the total). Only 19% of the KPIs are non-quantitative measures.
- Internal business process (50% of the KPI) and customers (50% of the KPI) play a significant role in SC environments. This shows that "customer is the king", but still we need a good operation to serve it.
- Most of the companies have weighted in a similar way the following KPI's:
  - Innovation and process improvement;
  - Resource utilization and flexibility;
  - Time and productivity.

The concept of supply chain management (SCM) is little widespread in Romania (Vasiliu and Dobrea, 2013). The authors carried out a research on its concept and application in Romanian companies, concluding that the level is low and the role of logistics service providers is undervalued. The authors also note that research in this area is relatively rare, with few studies leaning on this market, recommending that the subject be approached at doctoral thesis level.

6. Conclusions

The main objective of this study was to provide a critical review on the literature concerning on the concepts of supply chain strategy and strategic fit. The concepts were analysed separately, but also in a larger and integrative perspective.

The research question addressed the relation between range and quality of services and market winning. It can be said that there is strong connection between range and quality of services and market winning. The companies that have constantly improved their offer manage to acquire a substantial market share. All of these items have to be aligned in a well-thought strategy, with the appropriate kpi's and metrics.

Since the paper was based only on a literature review, the research has certain limitations. The authors intend to continue the study through case studies and quantitative research on the Romanian logistics market.

References

[1] Autry, C. W., Zacharia, Z. G., & Lamb, C. W. (2008). Logistics Strategy Taxonomy. *Journal of Business Logistics*, 29(2), 27-51.

[2] Beal, H. (2002). Exploratory research remains essential for industry, *Research Technology Management*, 45(11-12), pp. 26-30.

[3] Bowersox, D. J., & Daugherty, P. J. (1987). Emerging Patterns Of Logistical Organization. *Journal of Business Logistics*, 8(1), pp. 46-60.

[4] Council of Logistics Management's (CLM) (2003). *Annual Report*, Illinois US, Sep. 2003.

[5] Gunasekaran, A., & Kobu, B. (2007). Performance measures and metrics in logistics and supply chain management: a review of recent literature (1995-2004) for research and applications. *International Journal of Production Research*, 45(12), pp. 2819-2840.

[6] Large, R. (2007). The influence of customer-specific adaptations on the performance of third-party-logistics relationships – document studies and propositions. *International Journal of Logistics: Research and Applications*, 10(2), pp. 123-133.

[7] Morash, E. (2001). Supply Chain Strategies, Capabilities and Performance. *Transportation Journal*, 41(1), pp. 37-54.

[8] Porter, M. E. (1980). *Competitive Strategy: Techniques for Analysing Industries and Competitors*. New York: Free Press. (Republished with a new introduction, 1998).

[9] Saunders, M., Lewis, P., Thornhill, A. (2007). *Research Methods for business students*, 4th edition.

[10] Vasiliu, C., & Dobrea, M. (2013). State of implementation of Supply Chain Management in companies in Romania. *Amfiteatru Economic*, 15(33), pp. 44-55.

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Corruption and Its Implications in Romania

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Abstract

Corruption is a phenomenon that acts internationally, regardless of barriers or cultural differences. The mechanism of corruption is a complex one, with various forms of manifestation activating in all fields of activity, worldwide, from the most developed countries, to the poorest, causing major long-term imbalances, becoming an enemy of the normal functioning of state institutions and authorities, as well as a brake on economic advance. In Romania, in the last 30 years of democracy, corruption has developed and found new ways of manifestation, which have slowed down the process of economic, social, technological, educational evolution of the Romanian society, creating a feeling of distrust in the state institutions and in the business environment. The research question was to observe the impact of corruption in Romania, in the public sector as well as the business environment. The aim of this research is to present the evolution of corruption in Romania from 2007 to 2019, according to the Transparency International Index and also, to make a comparison to the phenomenon of corruption in our country versus the European Union average in the last 12 years and also, to highlight that the process of corruption is an impediment to the harmonious development of the business environment and the public sector.

Keywords: Corruption, Romania, Transparency, Business Environment, Education.

JEL Classification: D7, D73, O, O3

1. Introduction

The mechanism of corruption is a complex one, with various forms of manifestation activating in all fields of activity, worldwide, from the most developed countries, to the poorest, causing major long-term imbalances, becoming an enemy of the normal functioning of state institutions and authorities, as well as a

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brake on economic advance. The international community has concluded that no country is completely immune to the phenomenon of corruption, with devastating effects on the state institutions and implicitly on the citizens, as well as on the business environment, the only solution being that of finding solutions and tools in combating and preventing this type of crime, in the public and private sectors.

In any state, there is a smaller or higher number of officials who are corrupt and carry out activities in important places of the national economy and institutions, following the influence to some extent of the local or central authorities. Thus, corruption is found in most sectors of captivity, national or international, from the smallest positions, to the highest.

The scale of the globalization process, to a certain extent, facilitates the propagation of corruption at national, European and global level, affecting, on the one hand, all states and sectors of activity, but on the other hand it promotes the cooperation between authorities and states and creation of institutions aimed at combating and judging acts of corruption and persons involved (dignitaries, functionaries, businessmen, etc.).

In Romania, in the last 30 years of democracy, corruption has developed and found new ways of manifestation, which have slowed down the process of economic, social, technological, educational evolution of the Romanian society, creating a feeling of distrust in the state institutions and in the business environment.

2. Problem Statement

Corruption is a phenomenon that acts internationally, regardless of barriers or cultural differences. Corruption is complex and involves economic, political, social and cultural dimensions, being difficult to find a universally valid definition, as a result of evolution over time, depending on the political and social dynamics (Vitoria & Kroeze, 2015). According to the OECD in the Glossary of International Standards in Criminal Law in 2008, it has issued a series of definitions, taken by countries depending on the current situation: corruption represents the abuse of private or public funds for personal purposes (OECD, 2008) or "assets". or passive misuse of the powers of Public officials (appointed or elected) for private financial or other benefits". (OECD, 2002) Transparency International: "Corruption involves behaviour on the part of public sector officials, whether politicians or civil servants, who improperly and unlawfully enrich themselves, or those close to them, by the misuse of public power entrusted to them. " (OECD, 2007)

In a broad sense, corruption involves the misuse of the power held or entrusted with the objective of satisfying the interests of one or a group of people (Dr. Johann Graf Lambsdorff, 1999). The World Bank issued a definition which defined corruption as "the abuse of public or corporate office for private gain" (World Bank, 2005).

As a result of the increased interest in corruption, both on a global and national level, the Romanian authorities have modified and updated the legislation in recent years, including corruption in the Criminal Code, by defining the offenses that are

included in the generic notion of corruption. , thus: "giving bribes, taking bribes, trafficking in influence and buying influence, facts committed by or in connection with the members of the arbitration courts, acts committed by or in relation to foreign officials, etc." (Penal Code, 2009).

The main causes that allow this phenomenon to be born and even to develop, can be: the degree of involvement of the state from the economic field perspective designates corruption as the way to obtain personal benefits by appealing to the public position (in the situation of state-owned enterprises there are more official public positions, so the possibility / degree of corruption increases). States that enforce power through reduced degrees of extensiveness and intensity are democratic countries. From the perspective of education, the private environment and the civil society have important attributions, as opposed to the cultural and religious domains, in which the state does not enforce its control (Radu, L., & Gulyas, G, 2010) cultural and traditional aspects, the institutional capacity of the state to impose its rules − (the capacity of the state, in various situations, can be exceeded by the extent and development of corruption, thus, from a technical point of view). Public authorities may not be able to compete with the perpetrators, which may lead to the exacerbation of this phenomenon, the emergence of new forms of crime and the diminished trust of the citizens but also of the entrepreneurs in authorities; the type of system or political regime is presented by way of political organization, under the name of "the circulation of elites", which measures the degree of democratization of a state according to the percentage of the population, which occupies a political function and the prominence with which those who hold such positions are changed (Radu L. & Gulyas G., 2010). Thus, the regimes characterized by a maintenance of power for a long time by certain individuals can favour the increase of corruption. As a result of the process of globalization, corruption has become an extremely complex and versatile process, which may have different approaches: sociological, legal, economic, ethical, etc. (Carjaliu, 2009).

3. Research Questions/Aims of the research

The research question of the article is: how does corruption in Romania impacts the public sector as well as the business environment? In order to find an answer, we made a review of the specialized literature in the field of corruption, of the different approaches of the international institutions regarding this phenomenon, framework and presentation in the Criminal Code.

Therefore, the aim of this research is to present the evolution of corruption in Romania from 2007 to 2019, according to the Transparency International Index and also, to make a comparison to the phenomenon of corruption in our country versus the European Union average in the last 12 years. Another objective was to highlight that the process of corruption is an impediment to the harmonious development of the business environment and the public sector. Also, in this article we wanted to present the fight that the Romanian authorities are carrying against corruption through the Anti-corruption Strategy 2016-2020, as well as the National

Strategy for Research, Development and Innovation 2014-2020 with the main objective to it ensures economic growth by presenting the importance of research and highly trained staff.

4. Research Methods

The research methodology used in the drafting of this article was both qualitative and quantitative. By using the quantitative method, we took data from 2007-2019 interval from Transparency International for Romania, with which we were able to draw a graph showing the evolution of corruption in the 12 years mentioned and we also made a graph showing the average of the European Union in antithesis to the ecology of Romania for the same period of time. Also, to show the attractiveness of the country in the context of the development of the corruption phenomenon, we have taken data on Ease of Doing Business in Romania from 2014 to 2019.

Therefore, with the help of the qualitative method, we used the comparison method to present the evolution of corruption in Romania, but also to compare it with the EU average, as well as the synthesis in order to transmit this information as clearly and concisely.

5. Findings

One of the most serious problems facing Romania is corruption, a fact pointed out both by the civil society organizations with attributions in the field, as well as by the sociological research carried out, but especially by the international partner organizations.

The evolution of Romania regarding the corruption situation is analysed and presented in the reports of the European Commission on the progress of the country, starting with 1998, before the accession to the EU, in 2007, after accession, as well as in 2017 and 2018. In these reports, our country showed that it has not made enough efforts to fight corruption and to strictly adhere to the Commission's recommendations, so that in 2018 the results were not the best, rising the problem that the situation had evolved in such a way that the diversity of progress was ambiguous. Even in the first months of 2019, Romania did not make the necessary improvements and failed to adopt effective measures, so that the European Commission expressed its concern regarding the address of our country. Thus, the attention is focused on the problems in the field of justice and the importance of the managerial measures through which the possibilities of committing crimes are low or even irradiated. The judgment factor is essential in this process, but for this situation, solutions from the substrate should be found, because prosecuting, punishing corrupt persons is a long and costly process, and in certain situations the results are uncertain. The phenomenon of corruption is rapidly spreading as a result of the corruption of others (which becomes a "kind of stimulus for those tempted to commit illegal acts" (Radu, L. & Gulyas, G, 2010), becoming a process of multiplication in game theory, corruption has become

systematic (a feature of this type of crime is persistence - which makes the elimination process difficult) and once widespread, it generates a robust and inefficient balance, difficult to neutralize, because this phenomenon is self-feeding.

If we turn our attention to the evolution of corruption in Romania from 2008 to 2019, we can see a slight improvement, but our country is in the penultimate place in the Transparency International ranking, at European level, with a position higher than in Bulgaria (43) and on a par with Hungary (TI, 2019), which is supported by Figure 1.

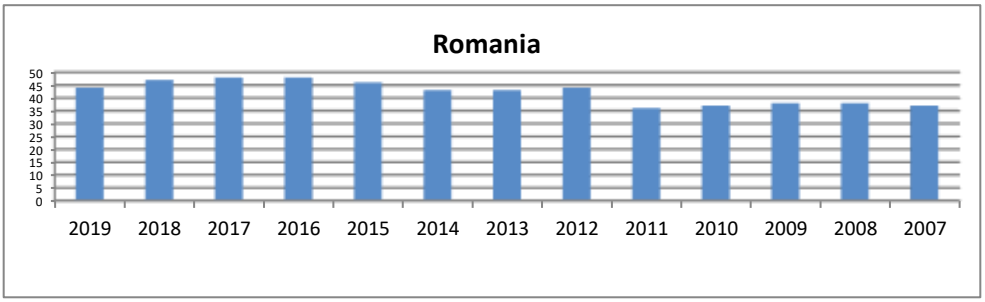

Figure 1
Source: adapted by the author from Corruption Perceptions Index (2019) Report in Romania

However, if we compare the last two years from Figure 2, we observe that in 2019, Romania had a decrease of three points, positioning itself on the same score as in 2012 (44). Also, the average of the European Union related to corruption was maintained in the same interval, with small differences from year to year (in the year 2008- 66, 2013- 63, 2019-64), observed in the graph below (TI, 2019).

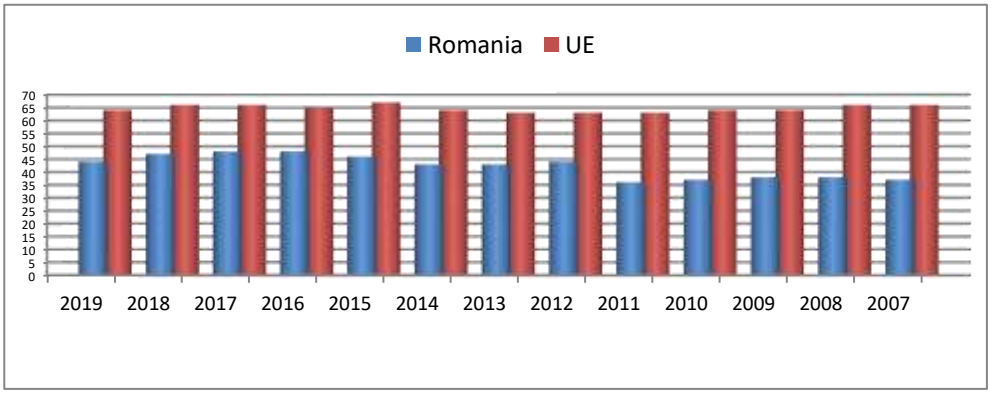

Figure 2
Source: adapted by the author from Corruption Perceptions Index (2019) Report in Romania

The main result of this index of corruption perception is, that at the level of the Romanian society there is an acute lack of integrity and education at the political level that contributes to the development and maintenance of the high degree of corruption in public institutions, affecting the society and the business environment.

Even the perception of citizens on the phenomenon of corruption in the Romanian state is not better. Thus, according to a survey conducted by the European Commission, between September and October 2019, Flash Barometer 482, in Romania, in the business environment, corruption is a major problem with a weight of 88%, compared to the European average of 37% (European Commission, 2019), and regarding the spread of this type of crime, the interviewees described a share of 97% in 2019, compared to 63% at European level (European Commission, 2019).

The Figure 3 shows that although the corruption perception index has fluctuated in the last 5 years (in 2004 the level was 44, the increase was in 2016, 2017 − 48, and in 2019 it dropped to 44), very high, compared to the European Union average, as Ease of Doing Business shows an increase in Romania's attractiveness for business activity. This interest of the business environment for Romania can be represented precisely by the implications of corruption, namely: lack of transparency, incorrect application of legislation, favouritism, bribery for various situations, etc.

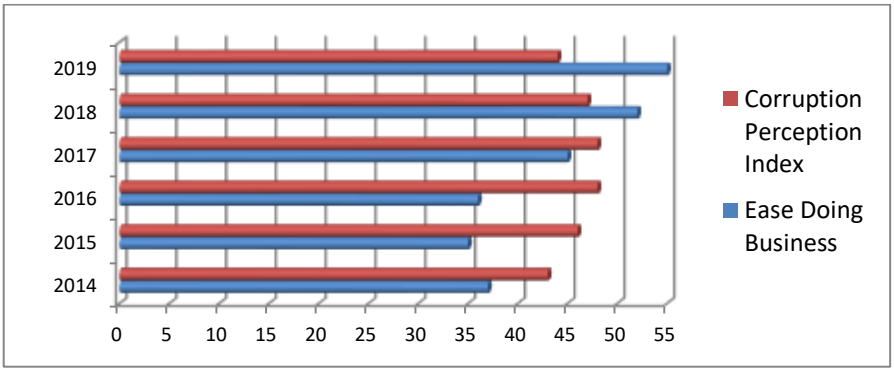

Figure 3
Source: adapted by the author from Ease of Doing Business and Transparency International Index

According to the freedom economic ranking, Romania is ranked 42nd in 2019, with a score of 68.6, being ranked regionally on the 21st place (out of 44 countries at regional level), and 42 in the world, with the moderately free status. (The Heritage Foundation, 2019). Foreign investors are reluctant about Romania, regarding the regulatory system which is unpredictable, and corruption is introduced at all levels of government and affects the rule of law (The Heritage Foundation, 2019).

6. Conclusions

The corruption phenomenon affects Romania, both from the public perspective − of the state institutions and of the civil servants −, as well as from the perspective of the business environment that diminishes the confidence of the foreign investors in the potential of the country, but also of the Romanian entrepreneurs who become reluctant to the training and professionalism of the local workforce. Thus, the extent to which the corruption phenomenon propagates and the finding of new ways of development and manifestation are of concern for the authorities, both nationally and internationally.

Therefore, at national level, the anti-corruption fight is in full swing, and the *National Anticorruption Strategy* for 2016-2020 has been materialized through the Government Decision no. 583/2016, being the result of a period of consultations, taking of good practices from the previous strategy and elaborating some directions of action adapted to the current situations. The purpose of this strategy is to promote the principles of integrity by applying, in a rigorous way, the "normative and institutional framework for preventing and combating corruption in Romania" (NAS, 2016), addressing public institutions with legislative, judicial, executives, the business environment, local public authorities and civil society. All types of interventions involve the transparency in the decision-making process, as well as the clarity of a double government on three pillars of intervention in the sphere of corruption: prevention, education, combating (NAS, 2016).

However, one of the major problems of Romania is the implementation of current laws. According to the reports of the European Commission, the Romanian judicial system has great difficulties, the most important being the poor quality of the staff, its lack or lack of qualified personnel in the key positions, the results being seen by the business environment in the country, therefore, at the country level, as a result of the raising awareness of the problem, the *National Strategy for Research, Development and Innovation* 2014-2020, which aims at an economic growth and to increase the role of science in society, with the help of qualified and trained human resources (NAS, 2016), both from a professional, as well as ethical point of view, an initiative conducted by the European Union by implementing the Europe 2020 strategy and the initiative *An innovation union with the help of the instrument − Horizon 2020* (European Commission, 2020) has been achieved.

Corruption remains a major challenge for the entrepreneurial environment, along with excessive administration and low degree of confidence of entrepreneurs in public administration, but Romania's strong point remains, according to Start-ups, Scale-ups and Entrepreneurship in Romania − Horizon 2020, “with upper − secondary-level education, exports in medium − and high-tech products, and employment in fast-growing firms in innovative sectors” (European Commission, 2020).

At the same time, Romania, like other countries of the European Union, is looking for solutions to fight corruption through legislative improvements and the development of new programs that coincide with the Europe 2020 Strategy. The

key documents adopted were "National Strategy for Competitiveness 2015-2020, the National Research-Development-Innovation Plan III 2015-2020, and the National Strategy on the Digital Agenda for Romania 2020" (European Commission, 2017).

References

[1] Alistar, V., & Moinescu, G., & Stănescu, I. (2006). *Ghid Anticorupție în justiție pentru cetățeni și oameni de afaceri* [Anticorruption Guide in the field of Justice for citizens and Business People], București. Retrited from https://www.transparency.org.ro/files/File/Ghid_anticoruptie_in_justitie_pe.pdf.

[2] Codul Penal (2009). *partea specială − Infracțiuni de corupție și serviciu, Capitolul I, Infracțiuni de corupție, art. 289, art. 290, art. 291, art. 292, art. 293, art. 294* [Penal Code, special part - Corruption and offenses in public position, Chapter 1, Corruption Offenses, article 289, article 290, article 291, article 292, article 293, article 294] Available at https://lege5.ro/Gratuit/gezdmnrzgi/infractiuni-de-coruptie-si-de-serviciu-codul-penal?dp=gqytsojvgm3to.

[3] Comisia Europeană (2019). *Barometru Flash 482 - Afacerile și corupția*, septembrie-octombrie 2019 [Flash barometru 482, Business and corruption, september-october 2019], p. 1, Retrieved from https://ec.europa.eu/romania/news/20191209_ziua_internationala_anticoruptie_flash_eurobarometer_ro.

[4] Comisia Europeană (2019). *Raport de țară din 2019 privind România* [European Commission, 2019 Country Report on Romania], Bruxelles / The European Commission, European Semester country report, 2019, Retrieved from https://ec.europa.eu/info/sites/info/files/file_import/2019-european-semester-country-report-romania_ro.pdf.

[5] Carjaliu, C. (2009). *Accepțiuni și sensuri ale noțiunii de corupție*, [Meanings of the notion of corruption] Revista de studii juridice Universitare, nr. 3-4, Moldova, Retrieved from https://ibn.idsi.md/ro/vizualizare_articol/97390.

[6] Dr. Johann Graf Lambsdorff (1999). *The Transparency International Corruption Perceptions Index 1999 − Framework Document*, Retrieved from https://images.transparencycdn.org/images/1999_CPI_Framework_EN.pdf.

[7] European Commission (2020). Retrieved from https://ec.europa.eu/programmes/horizon2020/en/area/innovation.

[8] European Commission (2020). *Horizon 2020 country profile for Romania*, Retrieved from https://ec.europa.eu/research/horizon2020/index.cfm?pg=country-profiles-detail&ctry=Romania.

[9] European Commission (2017). *Specific Support to Romania - Start-ups, Scales-ups and Entrepreneurship in Romania, Horizon 2020 Policy Support Facility*, Brussels, Retrieved from https://rio.jrc.ec.europa.eu/sites/default/files/report/KI-AX-18-008-EN-N.pdf.

[10] Ministerul Educației și Cercetării (2014). *Strategia Națională de Cercetare, Dezvoltare și Inovare*, 2014-2020. [The Ministry of Education and Scientific Research, The National Strategy for Research, Development and Innovation, 2014-2020], Retrieved from https://www.edu.ro/sncdi2014-2020.

[11] OECD Corruption (2007). *A Glossary of international criminal, standards*, p. 20, Retrieved from http://www.oecd.org/corruption/anti-bribery/39532693.pdf.

[12] OECD (2008). *Corruption: A Glossary of International Standards in Criminal Law*. OECD Publications, pp. 1-9, Retrieved from http://www.oecd.org/daf/anti-bribery/41194428.pdf.

[13] OECD SIGMA Paper (1998). *Effects of European Union Accession, Part 1: Budgeting and Financial Contro. Appendix 3: List of Useful Terms*, No. 19, Retrieved from https://stats.oecd.org/glossary/detail.asp?ID=4773.

[14] Radu, L., & Gulyas, G. (2010). *Corupţia în România, o problemă de nerezolvat*? [Corruption in Romania, an unsolvable problem] Revista Transilvana de Ştiinţe Administrative, 2(26), pp. 107-124, Retrieved from https://www.researchgate.net/publication/49606820_Corupția_în_România_o_problemă_de_nerezolvat/fulltext/57a7501008ae3f452938d1ab/Coruptia-in-Romania-o-problema-de-nerezolvat.pdf.

[15] The Heritage Index (2019). *Index of Economic freedom 2019*, Retrieved from https://www.heritage.org/index/pdf/2019/countries/romania.pdf.

[16] The Ministry of Justice (2014). Retrieved from https://sna.just.ro/Scop%2C+publicul+%C8%9Bint%C4%83+%C8%99i+abordarea+propus%C4%83.

[17] Transparency International Romania (2020). *Indicele de perceptie a coruptiei 2019, Recomandări și soluții pentru Români*a, [Corruption Perceptions Index 2019, Recommendations and Solutions for Romania] București, Retrieved from https://www.transparency.org.ro/sites/default/files/Comunicat%20TI-Romania_Perceptia%20coruptiei%20in%202019.pdf.

[18] Transparency International (2019). *Corruption Perception Index*, Retrieved from https://images.transparencycdn.org/images/2019_CPI_Report_EN_200331_141425.pdf.

[19] Dr. Vinay Bhargava (2005). *The Cancer of Corruption*, World Bank Global Issues Seminar Series, International Affairs, p.1 Retrieved from https://www.researchgate.net/profile/Elizabeth_Harrison9/publication/220011267_The_aCancer_of_Corruptiona/links/54d229090cf28959aa7c284b/The-aCancer-of-Corruptiona.pdf.

[20] Vitoria, A., and Kroeze, R. (2015). December 9. *How History can Help Us Think about Corruption and Anti-Corruption. P. 2* Retrieved from: http://www.historyandpolicy.org/opinion-articles/articles/how-history-can-help-us-think-a.

[21] Warren, M. E. (2004). „*What Does Corruption Means in a Democracy?*", American Journal of Political Science, 48(2), Retrieved from https://projects.iq.harvard.edu/gov2126/files/warrendemocracy.pdf.

[22] Wrong, D. H. (2002). *Power: Its Forms, Bases and Uses*, (3rd ed.), New Brunswick, NJ: Transaction Publishers, Rutgers, pp. 14-16.

[23] https://tradingeconomics.com/romania/ease-of-doing-business.

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Tourism in the BRICS Countries in the Context of the COVID-19 Pandemic

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Abstract

This article aims to highlight the impact of COVID-19 pandemic on the BRICS countries. Tourism is a very important activity for the economy of emerging countries in general, and the BRICS countries in particular. At the same time, tourism is an activity very sensitive to various risk factors. Tourism was developed with the view of diversifying the economic activities of these countries. In recent decades, the emergence of new risk factors, such as epidemics, that generated unprecedented health crises, have begun to have an increased impact, including in the BRICS countries. Thus, the inbound and outbound tourism of the BRICS countries was severely affected by the COVID-19 pandemic.

Keywords: BRICS countries, emerging economies, tourism, sanitary crisis, COVID-19.

JEL Classification: I10, L80, L83

1. Introduction

The BRICS countries are a group of emerging economies, in which tourism has grown in the context of sustainable development. These countries, which have important natural resources, are trying to diversify their economic activities and develop activities in other, more environmentally friendly sectors. Many emerging countries support and encourage the development of tourism, alongside traditional activities.

Over six decades of continuous growth, tourism has been one of the most important sectors of activity in terms of economic growth, both locally and globally (OECD, 2020a), participating in 2019, with 10.3% in achieving world GDP (USD 8.9 trillion), 1/10 of all jobs (330 million) and ¼ of all net new jobs created over the last five years (WTTC, 2020a). Globally, tourism continues to perform with 1.5 million international arrivals in 2019 (UNWTO, 2020a).

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Emerging economies are contributing with larger proportions of travellers to this global trend and are becoming increasingly desirable as destinations as they show greater competitiveness in travel and tourism (WEF, 2019).

The BRICS group of emerging countries is among the most sought after destinations in the world: China and India in Asia, the Russian Federation in Europe, Brazil in South America and South Africa in Africa. Travel & Tourism (T&T) competitiveness can be seen simultaneously as a powerful economic growth drive, or a risk to ongoing development of the industry, if not managed correctly. The BRICS countries had in 2019 very good positions in the T&T competitiveness report ranking. China ranked 13th (score 4.9), and is Eastern Asia-Pacific's largest T&T economy, accounting for over one-half of the sub-region's T&T GDP. The country has the index's best score for the natural and cultural resources sub-index. Brazil ranked 32nd (score 4.5), and has both the region's largest and most competitive T&T industry and environment thanks to exceptional natural (2nd) and cultural (9th) resources. India ranked 34th (score 4.4), and had the greatest ranking improvement (from 40 to 34). The Russian Federation ranked 39th (score 4.3), and is Eurasian's most competitive T&T economy and accounts for the majority of the sub-region's T&T GDP. It is the only Eurasian economy to score above the global average for natural (34th) and cultural (18th) resources. South Africa ranked 61st (score 4.0), and is the most competitive of the three sub-regions in Sub-Saharan Africa, but has experienced slow growth in competitiveness over the past two years. South Africa's biggest advantages come from tourist services infrastructure and T&T prioritization, although the sub-region does perform below the global average in both areas. South Africa has, by far, the largest T&T industry in Sub-Saharan Africa. The country's most significant advantage is its combination of natural (15th) and cultural (23rd) resources (WEF, 2019).

At the same time, tourism is a very sensitive activity to various risk factors. In general, the causes of tourism crises are of economic, political, geopolitical, security (terrorist attacks) and environmental nature. These crises can affect the demand and supply of tourism in different states. In recent decades, the emergence of new risk factors, such as epidemics, that generated unprecedented health crises, have begun to have an increased impact. The first health crisis that had effects on tourism for a longer period was the Ebola epidemic, which affected West Africa (99% of cases were in Guinea, Sierra Leone and Liberia). Ebola was the only epidemic with a major impact on T&T (WTTC, 2018) compared to other epidemics and crises studied by the WTTC.

The spill-over of SARS-CoV-2 virus, Ebola, and other infectious pathogens from animals to human beings is an important reminder of the need for countries to include protection of our biodiversity as part of interventions to effectively manage outbreaks of epidemics or pandemics in human populations. 2020 meant for the whole world a confrontation with an enemy that is difficult to control, the SARS-CoV-2 pandemic. Tourism activity has been affected by this enemy from the beginning, as tourism is one of the sectors most affected by this health crisis.

This article aims to analyze tourism activity in the BRICS emerging economies in the context of this new health crisis.

2. Literature Review

In the specialized literature, the coronavirus-type of viruses was presented as a family of viruses capable of causing the disease on both animals and humans. Coronavirus 2019 (COVID-19) is the most recently discovered coronavirus, an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In November 2019, the first case was detected in Wuhan, Hubei Province, China. Later on, other outbreaks were reported in countries such as Iran, Italy or South Korea (McKibbin & Fernando, 2020).

The causes of the global recession of 2020 are definitely something new in modern history, generating new types of recessions, different from previous ones. Thus, Ozili and Arun (2020) show how factors that are not of a financial or economic nature can generate a mixture of financial and economic crisis. Several authors have written about the social and economic implications of the pandemic (Nicola et al., 2020; McKibbin & Fernando, 2020), along with the World Tourism Organization (UNWTO), World Travel & Tourism Council (WTTC), Organization for Economic Co-operation and Development (OECD), and International Monetary Fund (IMF) publications, which have continuously analyzed the evolution of the disease and its impact on tourism industry. Research on the effects of travel restrictions is to be found in Chinnazi et al. (2020), whereas Koh (2020) presents a study on high-risk occupations connected with tourism (guides, taxi drivers, casino workers, cruise crews, tourism and hotel industry workers).

3. Research Methods

To highlight how tourism in the BRICS countries has been affected by the pandemic, the quantitative method is the one that can help us make a comparison between the relevant data for 2018 and 2019 and the similar accessible data for 2020. For tourism it is important to analyze the number of international arrivals, accommodation, tourism revenues and the contribution of tourism to GDP. In order to carry out this research, data provided by WTTC, UNWTO, OECD and IMF were used, which were processed by the author for this purpose.

4. Findings

As China is the country from where the disease spread (Hoque, 2020), it is important to see how the pandemic affected the tourism industry in the BRICS countries. Tourism is an activity of the tertiary sector, which has gained increasing importance worldwide, including in emerging countries, such as the BRICS countries. Tourism in the BRICS countries is rich in diverse natural resources, but some of them are depletable. Tourism offers a chance to diversify economic activities, which support a sustainable development, including a sustainable tourism.

4.1. China

China is both an important recipient of tourists, the main suppliers being states such as South Korea, Japan, United States, Russia, Vietnam, Singapore, India and Australia (OECD, 2020b), but also a large provider of tourists, especially for states in the Asia-Pacific region such as Thailand, South Korea, Singapore, Malaysia, Vietnam, as well as Japan, Australia, and Russia. Many Asian countries rely on Chinese tourists and were heavily affected by China's move to cancel outbound group trips indefinitely. Among them we can name Thailand and Japan. China is Thailand's number one market, generating nearly 30% of all arrivals. The Tourism Council of Thailand has estimated losses of at least USD 1.6 billion as a result of the lockdown (WTTC, 2020a). In 2018, China outbound tourist arrivals totalled 149.72 million, contributing to the economic development of the local area. Revenues from domestic tourism are also very important, 86% representing the domestic spending out of the total spending in 2019 (WTTC, 2020a). In the context of the outbreak of the SARS-CoV-2 epidemic and its spread in different regions of the country, people were advised to stay home to protect themselves from the virus. These lockdowns and other related measures have led to a decrease in tourism activity, both internally and externally.

Beijing has postponed the departure of all groups from China, and other countries such as Singapore, the United States and Australia have restricted access to foreigners coming from China (Hoque, 2020). Many domestic and international flights have been delayed due to the panic created by the spread of coronavirus, thus severely affecting airlines. Even though the infectious spread of COVID-19 has been slowing down in China, the effects of the pandemic on Chinese tourism industry are severe. The domestic tourism revenue in the country was estimated to drop 69% in the first quarter of 2020, followed by a 20.6% decline in the whole year of 2020. Amidst the global turbulence, in an initial assessment, the IMF expects China to slow down by 0.4% compared to its initial growth target to 5.6%, also slowing down global growth by 0,1% (OECD, 2020a).

4.2. Russia

In 2017, tourism contributed USD 18,670 million to the economy, i.e., 3.8% of Russian GVA (Gross Value Added) – an increase of 21.4% from 2016. In 2018, tourism expenditure amounted to USD 38,791 million. The number of international visitor arrivals recorded in 2018 was 24.6 million. The main source markets were Ukraine (with a 33.4% market share) followed by Kazakhstan (14.3%) and China (6.9%). Other key markets include Finland, Azerbaijan, Poland and Germany. The number of domestic arrivals recorded in 2018 was 62.2 million, an increase of 16.2% from 2017. In 2018, the number of total departures was of 42 million, and the destinations preferred by Russian people were Turkey (5.7 million), Finland (3.3 million), Kazakhstan (2.9 million), Ukraine (2.3 million) and China (2 million) (OECD, 2020a).

4.3. Brazil

Tourism in Brazil accounts directly for 3.1% of GDP, rising to 9.6% if indirect effects are also included. The sector supported 2.1 million jobs in 2018, which account for 2.5% of total employment. In 2018, international tourist arrivals reached 6.6 million and their spending amounted to USD 6,320 million. Argentina was the largest source market with 2.5 million tourists (37.7% of total), followed by the United States (8.1%), Chile (5.9%), Paraguay (5.4%) and Uruguay (5.3%). With over 206 million trips in 2015, the domestic market has high potential for growth. The majority of Brazilians choose domestic destinations for their holidays, including carnival and summer breaks. The main destinations are the Northeast regions, followed by the Southeast and South regions. In 2018, outbound tourism was 10.7 million and the preferred international destinations were the United States (2.2 million), Portugal (1.1 million), Argentina (0.9 million), Chile (0.58 million) and Spain (0.55 million). Tourism expenditure was USD 22,227 million (OECD, 2020a).

4.4. South Africa

In 2017 the direct contribution of the T&T sector to GDP amounted to USD 9,784 million, representing a 2.8% direct contribution to GDP. The outbound expenditure totalled USD 6,344 million, which is a positive balance for South Africa (OECD, 2020a). Direct employment in tourism totalled 722,013 in 2017, representing 4.5% of the total workforce. In 2018, there were 10.5 million international tourist arrivals, up 1.8% over 2017, and 4.5 million same-day visitors (total arrivals 15 million). Key source markets are other African countries, which make up over 70% of all international arrivals. Zimbabwe is the top source market (21.1% of tourists) followed by Lesotho (16.6%) and Mozambique (13.0%). South Africa's major long-haul overseas markets are the United Kingdom, the United States and Germany. Domestic tourism trips totalled 17.7 million. In terms of departures, the number of tourists from South Africa was 6 million. In 2018, South Africa was ranked the third most visited country in Africa, after Morocco and Egypt (UNWTO, 2020a).

4.5. India

Foreign tourist arrivals in India in 2018 totalled10.56 million, and the earning from tourism amounted to USD 28.585 billion. The source countries for foreign tourist were Bangladesh (21.3%), United States (13.8%), United Kingdom (9.75%), Sri Lanka, Canada, Australia, Malaysia, China, and the Russian Federation. Departures from India in 2017 totalled 26.30 million, the main destinations being Saudi Arabia (1,581,233), United States (1,285,466), Thailand (1,281,681), Singapore (1,272,077), China (818,954), United Kingdom (561,573), Malaysia, Indonesia, Sri Lanka, and Oman. Domestic tourist visits in India in 2018 were 1,854.9 million (GIMT, 2019). However, by analysing each month, we can see how in 2020, the situation has worsened. While in January 2020 there were

1,118,150 arrivals compared to 2019, with 1,103,380 arrivals, an increase by 1.3%, in February 2020 there were 1,015,632 arrivals compared to 1,087,694 arrivals in 2019, i.e., a decrease of 6.6%, and the decrease became all more pronounced in March, when the pandemic was declared and the danger became more aggressive, with 328,462 arrivals in 2020 as compared to 978,236 in March 2019, registering a decrease of 66.4% (GIMT, 2020).

In the first quarter of 2020, the devastating effects of the pandemic began to be felt in the tourism industry, reducing the number of foreign tourists, compared to the same period last year. Thus, in India, throughout January-March 2020, 2,462,244 tourists were registered, compared to 2019 when there were 3,179,792 tourists, i.e. a decrease of 22.6% (GIMT, 2020). Revenues over the same period decreased by 17.1% from USD 7.427 billion, in January-March 2019, to USD 6.159 billion, in January-March 2020.

5. The Way Ahead

Taking into account the unparalleled introduction of travel restrictions across the world, the expectation is that the international tourist arrivals will be down by 20% to 30% in 2020 as compared to 2019 figures, which means a decline in international tourism receipts (exports) of USD 300-450 billion, i.e., almost one third of the USD 1.5 trillion generated in 2019. UNWTO notes that in 2009, during the global economic crisis, international tourist arrivals declined by 4%, while the SARS outbreak led to a decline of just 0.4% in 2003 (UNWTO, 2020b). On average, domestic and inbound tourism account for 75% and 25% of internal tourism consumption, respectively. The importance of domestic tourism varies considerably at country level (OECD, 2020a). According to experts (UNWTO, 2020c), the recovery in domestic tourism will be possible in the second half of 2020, and the majority of experts are of the opinion that domestic tourism would only partially (52%) compensate for the temporary drop in international tourism or not at all (42%). Panel experts from Europe and Asia-Pacific region see a start of the recovery in the third quarter of 2020, with a more or less full international tourism recovery by 2021. As of June 15, 2020, 22% of all destinations worldwide (48 destinations) have started to ease restrictions, with Europe leading the way. Asia-Pacific, the first region to suffer the impact of the pandemic, had a 60% decrease in arrivals in January-May 2020, whereas the Americas and Africa both a 47% decrease (UNWTO, 2020c).

T&T are huge global businesses that contribute to the global GDP as well as global employment. Prospects for China have been revised markedly, with growth slipping below 5% in 2020, before recovering to over 6% in 2021, as output returns gradually to the projected levels before the outbreak (OECD, 2020b). The IMF (2020) had predicted a moderate global growth of 3.4 percent for 2020. But the COVID-19 disease changed the outlook unexpectedly (Ozili & Arun, 2020). Output contractions in China are being felt around the world, reflecting the key and rising role China has in global supply chains, travel and commodity markets.

The tourism industry was affected as the travel opportunities for Chinese tourists, who usually spend billions annually, were severely curtailed. The impact on travel to and from China may have devastating effects on the global economy. Many airlines have canceled several flights or significantly reduced the number of flights in and out of China. Many countries closed their land borders, cross-border ferries, and railways to and from China. China itself implemented strong border control policies to reduce the number of imported cases.

Table 1. Overview of the World Economic Outlook Projections
Real GDP, annual percent change

	2019	2020	2021
World output	2.9	-3.0	5.8
Emerging markets and developing economies	3.7	-1.0	6.6
China	6.1	1.2	9.2
India	4.2	1.9	7.4
Russia	1.3	-5.5	3.5
Brazil	1.1	-5.3	2.9
South Africa	0.2	-5.8	4.0

Source: Adapted from IMF, World Economic Outlook, April 2020, p. 7.

However, according to Table 1, in a more optimistic projection, China and India will recover faster after the crisis, while other states will experience a more difficult time. This aspect is supported by the strong economy of the two states, which have a faster capacity for action and the relationship with the other economies of the world.

6. Conclusions

The BRICS countries receive most of the tourists from the neighboring countries, but also tourists from the BRICS countries go to the neighboring countries to a large extent, developing an intra-continental tourism, which is worth taking into account in view of the fact that some trips can be made on land, in a safer manner in the lockdown and post-lockdown periods when many flights were canceled. Domestic tourism has become significant in more and more countries due to traffic restrictions and the spread of the virus. The BRICS countries are oriented towards domestic tourism, being among the largest consumers of domestic tourism with domestic spent of total tourism by 86% in China, 83% in India, 94% in Brazil, and 71% in Russia.

Although severely affected by the COVID-19 pandemic, the tourism activity continued to take place in the BRICS countries due to the fact that Brazil and South Africa are in the Southern hemisphere, where in January-March is a hot season and the spread of the virus was slower. Overall, the BRICS countries are trying to find solutions to overcome the crisis and unite in providing aid to other states that want to receive aid.

References

[1] Chinnazi, M., et al. (2020). The effect of travel restrictions on the spread of the 2019 Novel Coronavirus (COVID-19) outbreak. *Science, 368*(6489), pp. 395-400.

[2] Government of India Ministry of Tourism (GIMT). (2020) Foreign Tourist Inflow to India (January, February, March, 2020). Retrieved from: https://tourism.gov.in/sites/default/files/2020-05/Brief%20Note%20FTA%20March%2020_0.pdf.

[3] Government of India Ministry of Tourism (GIMT). (2019). India Tourism Statistics at a Glance – 2019. Retrieved from http://tourism.gov.in/market-research-and-statistics.

[4] Hoque, A. et al. (2020). The effect of Coronavirus (COVID-19) in the tourism industry in China. *Asian Journal of Multidisciplinary Studies*, 3(1), pp. 52-58.

[5] IMF. (2020). *World Economic Outlook: The Great Lockdown*. Washington DC https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020#Introduction.

[6] Koh, D. (2020). Occupational risks for COVID-19 infection. *Occupational Medicine*, 70(1), pp. 3-5.

[7] McKibbin, W. J., & Fernando, R. (2020). The global macroeconomic impacts of COVID-19: seven scenarios. *CAMA Working Paper* No. 19/2020. Retrieved from: http://dx.doi.org/10.2139/ssrn.3547729, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547729.

[8] Nicola, M., et al. (2020). The socio-economic implications of the Coronavirus and COVID-19 Pandemic: A review. *International Journal of Surgery*, 78, pp. 185-193.

[9] OECD. (2020a). *OECD Tourism Trends and Policies 2020*. Paris: OECD Publishing. Retrieved from https://doi.org/10.1787/6b47b985-en.

[10] OECD. (2020b). OECD Interim Economic Assessment, Coronavirus: the World Economy at Risk. Paris: OECD Publishing. Retrieved from: http://www.oecd.org/economic-outlook, https://www.oecd.org/berlin/publikationen/Interim-Economic-Assessment-2-March-2020.pdf.

[11] Ozili, P., & Arun, T. (2020). Spillover of COVID-19: Impact on the global economy. MPRA_paper_99317.pdf. Retrieved from https://mpra.ub.uni-muenchen.de/id/eprint/99317.

[12] WEF. (2019). *The Travel & Tourism Competitiveness Report 2019*. Geneva: WEF. http://www3.weforum.org/docs/WET_TTCR_2019.pdf.

[13] UNWTO. (2020a). *World Tourism Barometer*, 18(1). Retrieved from https://doi.org/10.18111/wtobarometerereng.

[14] UNWTO (2020b). International Tourist Arrivals could fall by 20-30% in 2020, 26 March 2020. Retrieved from https://www.unwto.org/news/international-tourism-arrivals-could-fall-in-2020.

[15] UNWTO (2020). World Tourism Barometer and Statistical Annex, Update July 2020.Retrieved from https://www.e-unwto.org/doi/abs/10.18111/wtobarometereng.2020.18.1.4.

[16] UNWTO. (2019). *International Tourism Highlights 2019 Edition*. Madrid: UNWTO. Retrieved from https://doi.org/10.18111/9789284421152.

[17] WTTC. (2020a). *Travel &Tourism: Global Economic Impact & Trends*. Retrieved from https://wttc.org/Research/Economic-Impact.

[18] WTTC. (2020b). *Travel &Tourism: Monthly Economic Impact- March*. Retrieved from https://wttc.org/Research/Economic-Impact.

[19] WTTC. (2018). Impact of the Ebola epidemic on Travel &Tourism. Retrieved from: https://wttc.org/Research/Insights, file:///C:/Documents%20and%20Settings/iuliana/My%20Documents/Downloads/Impact_of_the_Ebola_epidemic_on_Travel_and_Tourism_2018.pdf.

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Contemporary Business − Between Sustainability and Waste

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Abstract

The use of waste management in the context of sustainability has been increasingly important over the years. Despite this importance, it is noticed that this area is still little explored and there are many possibilities of academic research. The main goal of this report is to form a waste management plan, help implement a waste management plan, and encourage adopting new environmental technologies. This report discusses a short introduction about the sustainable process, waste management, and case study in Romania.

Keywords: Sustainability, Waste management, The Ministry of Environment, Romania, Contemporary Business.

JEL Classification: M11, Q01, Q53, Q56

1. Introduction

Nowadays, overpopulation and rapid development of industries and lifestyles lead to an increase in consumption and a depletion of natural resources. On the other hand, humans have always produced waste and disposed of it in a way, which influenced the environment. Therefore, the increase in waste that is generated by industrial factories and human activities needs to be managed. For this reason, scientists have been researching intensely in fields such as sustainable engineering and green engineering to reduce energy and natural resource consumptions. The idea of sustainability has a quantifiable unit, which refers to three pillars of social, environmental, and economic life. These pillars focus on environmental policies, which increasingly require the reduction, reuse, and recycling of waste. This type

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of action contributes to closing the loop of material use throughout the economy by providing waste-derived materials as inputs for production (Skumatz et al., 2008).

Sustainable manufacturing process and solid waste management are used for conserving valuable natural resources, preventing the unnecessary emission of gas and protecting public health. The main goals include reducing environmental impacts and offering economic opportunities. Solid-state recycling process becomes an effective and powerful methodology to achieve the green state forming from recyclable waste to useful parts. The developed process can be considered as a typical green movement or environmentally manufactured process. It has many benefits including simpleness, cost-effectiveness, and energy-saving and can be cleanly recycled as it does not harm the environment (Sachs et al., 2006).

The main goal of this report is to explain the main advantages of a sustainable manufacturing process and its effects in minimizing or eliminating production and processing wastes through eco-efficient practices, and it encourages the adoption of new environmental technologies. Therefore, this report discusses a brief introduction about the sustainable process, waste management, and the case study of Romania.

2. Literature Review

2.1 Problem statement

Given the wide range of issues inherent to the concept of sustainability, the increasing volume of information related to this subject and their complexity, the insertion of KM can provide many benefits to this area of research (Chang et al., 2018; Halati and He, 2018; Reijsen et al., 2015; Singh and El-Kassar, 2019; Yigitcanlar, 2011) and therefore needs to be further deepened. Currently, the use of the concept of sustainability is discussed and used in several types of research around the world, which led to the dissemination of several conceptual interpretations according to the purpose of each research, resulting in the considerable extension of its meaning and importance. A widely adopted definition of sustainability is that developed in the World Commission on Environment and Development WCED (Brundtland, 1987, p. 41): “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

As a consequence of transdisciplinary intrinsic to the concept of sustainability, standard definitions can hardly encompass its true dimensions. In this sense, Biswas et al. (2018) and Bhandari et al. (2018) highlight the importance of the Triple Bottom Line (TBL) for an adequate understanding of the dimensions of sustainability. Initially created by John Elkington, the TBL (“people, profit and planet”) played an important role in the search for an understanding of sustainability. According to this concept, the dimensions of sustainability are economic, social and environmental. That is, for a company to be considered sustainable, in addition to being profitable, it needs to take into account in its

decision-making the social and environmental impacts of its actions (Biswas et al., 2018; Depken and Zeman, 2018; Zhang et al., 2018).

The three Rs are commonly used terms in waste management; they stand for "reduce, reuse, and recycle". As waste generation rates have risen, processing costs increased, and available landfill space decreased, the three Rs have become a central tenet in sustainable waste management efforts (El-Haggar, 2007; Seadon, 2006; Suttibak & Nitivattananon, 2008; Tudor et al., 2011). The concept of waste reduction, or waste minimization, involves redesigning products or changing societal patterns of consumption, use, and waste generation to prevent the creation of waste and minimize the toxicity of waste that is produced (USEPA, 1995). Common examples of waste reduction include the use of reusable coffee mugs instead of disposable ones, reducing product packaging, and buying durable products which can be repaired rather than replaced. Reduction can also be achieved in many cases through reducing consumption of products, goods, and services. The most effective way to reduce waste is by not creating it in the first place. Therefore, it is obvious why reduction is placed at the top of waste hierarchies (USEPA, 2010).

As it was the case with the coffee cups, in many instances, reduction can be achieved through the reuse of products. Efforts to take action to reduce waste before it is actually produced can also be termed pre-cycling. It is sometimes possible to use a product more than once in its same form for the same purpose; this is known as reuse (USEPA, 1995). Examples include using single-sided paper for notes, reusing disposable shopping bags, or using boxes as storage containers (UC Davis, 2008). Reusing products displaces the need to buy other products thus preventing the generation of waste. Waste minimization through reduction and reuse offers several advantages, including: saving the use of natural resources to form new products and the wastes produced in the manufacturing processes; reducing waste generated from product disposal; and reducing costs associated with waste disposal (USEPA, 2010).

Not all waste products can be disposed and even reusable products will eventually need to be replaced. It is inevitable to convert that waste into a by-product of daily human living (Kim, 2002), but in many cases it is possible for this waste to be diverted and recycled into valuable new materials. Glass, plastic and paper products are commonly collected and reformed into new materials and products. Recycling products offer many of the benefits of waste reduction efforts: displacing new material usage, reducing waste generated and the costs associated with disposal. However, recycling requires energy and the input of some new materials. Therefore, this process is lengthier, placing recycling lower on the waste hierarchy than reduction and reuse (UC Davis, 2008; USEPA, 2010). Many waste management frameworks seek to incorporate the three Rs in some capacity. In the UK, North America, throughout Europe and in parts of Asia, waste hierarchies are being incorporated, thus promoting the adoption and use of "reduce, reuse and recycle" initiatives (Allwood et al., 2010). Waste management hierarchies place the

highest priority on waste prevention, reuse, and then waste recovery. Disposing materials in a landfill is the least desirable of the options (ECOTEC, 2000).

2.2 The Research Gap

This study aims to research the extent to which waste management can contribute to achieving sustainability in new urban projects in Romania. This will be done by taking advantage of the main indicators of organizations supporting sustainability. Afterwards, the study will propose a series of steps to be taken into consideration. These will lead in a direction that helps this urbanization rise and become sustainable.

3. Research Questions / Aims of the Research

3.1 Research questions

The main goal of this article is to study how Romania acts with regard to waste management and to give recommendations for good practices. As mentioned above, urban plans in Romania lack the application of the principles and goals of sustainability in their projects. The absence of these elements from its clear goal to achieve sustainability can be easily noticed as most of these projects aim to achieve investment purposes without considering the importance of the environment and sustainable urban systems.

In conclusion, this type of generalized behaviour in the Romanian system makes us ask three questions:

- What components are essential in a comprehensive waste management plan?
- What types of considerations should Romanian organizations contemplate in developing a waste management plan?
- What is the range of options that exists in forming a waste management plan?

3.2 Purpose of the study

This study aims to research the extent to which waste management can contribute to achieving sustainability in new urban projects in Romania by taking advantage of the indicators of organizations supporting sustainability, then reaching a direction that helps this urbanization to rise and become sustainable urbanization.

4. Research Methods

The research relied on the descriptive approach, through describing the phenomena related to the study, as well as on the analytical approach through the use of statistical methods in analysing the data of the questionnaire collected, with the aim of identifying the relationship between the integrated waste management and sustainable development process, in order to reach results and

recommendations based on which to make decisions that bring the best possible benefit for the society.

The research used a sample of workers in the Romanian Ministry of Environment, the number of individuals in the sample reaching 50 during the period November - December 2019.

5. Results

Questionnaire analysis, the first axis:

Table 1. The axis of the integrated waste management process

Phrase	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Relative weight
There is a lot of interest in the integrated waste management process	48	30	12	6	4	0.824
There are capabilities that enhance the effectiveness of the integrated waste management process	42	28	14	10	6	0.780
The integrated waste management process starts from the collection areas	38	32	10	14	6	0.764
There are many effective methods used in the assembly process	32	34	14	12	8	0.740
Citizen behaviour affects the integrated waste management process	44	30	12	10	4	0.800
The prevailing energy policy of the country affects the integrated waste management process	40	34	14	6	6	0.792
Community economic factors influence the integrated waste management process	34	28	12	14	12	0.716
Advanced technology affects the efficiency of the integrated waste management process	38	32	14	10	6	0.772
The integrated waste management process improves the surrounding environment	40	34	12	6	8	0.784
The integrated waste management process reduces environmental pollution to the lowest possible level.	38	32	10	14	6	0.764
The integrated waste management process is subject to effective control from the competent authorities.	32	34	14	12	8	0.740

Source: Produced by the author, using the SPSS software.

When arranging the axis statements in terms of the degree of relative importance, the value of the greatest relative weight, from the point of view of the study sample, was "There is a lot of interest in the integrated waste management process" with a relative score of 0.824. The second variable in terms of relative importance was "Citizen behaviour affects the integrated waste management process" with a relative score reaching 0.800. The variable "The prevailing energy policy in the country affects the integrated waste management process" reached third place with a value of 0.792; and the following "Integrated waste management process improves the surrounding environment" with 0.784.

In what concerns the rest of variables, these are as follows: "There are all capabilities that help in the effectiveness of the integrated waste management process", 6th place in terms of relative importance with a score of 0.780; then "Advanced technology affects the efficiency of the integrated waste management process", 7th place with a value of 0.772; then "The integrated waste management process starts from the collection areas" and "The integrated waste management process reduces environmental pollution to the lowest possible level", both reaching a relative value of 0.764. The least important variables form the point of view of the study group were "There are many effective methods used in the assembly process"; "The integrated waste management process is subject to effective control from the competent authorities" – both scoring 0.740 and last "Community economic factors influence the integrated waste management process", with a relative weight of 0.716.

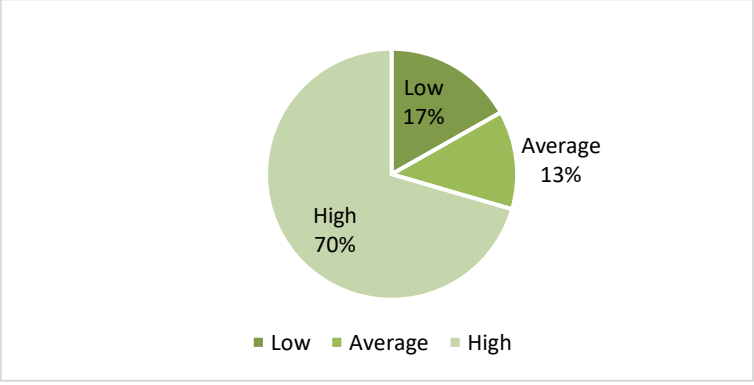

Figure 1. Axis levels of the integrated waste management process

It is clear that the axis has been divided into 3 levels (high - medium - low) and it was found that for 70.5% of the sample, the focus of the study is in the high level, while for 12.7% of the sample, the focus of the study is in the middle level, while the low level consists of 16.8% of the sample, which shows a high level of performance of the integrated waste management process from the point of view of the study sample individuals.

The second axis:

Table 2. The axis of sustainable development

Phrase	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Relative weight
The integrated waste management process contributes to community development	44	30	12	10	4	0.800
The integrated waste management process increases the level of environmental awareness of citizens	40	34	14	6	6	0.792
The integrated waste management process contributes to achieving the environmental goals required to be achieved	40	34	12	6	8	0.784
The efficiency of the integrated waste management process increases as a result of the increase in the efficiency of the control management method	34	30	14	16	6	0.740
The Ministry of Environment aims to achieve sustainable development through many methods	42	26	12	10	10	0.760
The integrated waste management process meets the objectives of the Ministry of Environment in achieving sustainable development	32	30	18	14	6	0.736
There are many benefits to society through the integrated waste management process	38	32	14	12	4	0.776
The integrated waste management process is achieved in the development of the environmental sector	42	26	14	12	6	0.772
The integrated waste management process is in line with the development goals to be achieved	40	28	14	14	4	0.772
The country was able to achieve high levels of development as a result of using various methods of development	44	30	12	10	4	0.800

Source: Produced by the author, using the SPSS software.

When arranging the axis statements in terms of the degree of relative importance, from the point of view of the study sample, it was found that "The integrated waste management process contributes to community development" and "The country was able to achieve high levels of development as a result of using various methods of development" were considered to be the most relevant of the axis with a relative weight of 0.800. Following closely, the study group considered the variable "The integrated waste management process increases the level of environmental awareness of citizens" to be of importance to sustainable development with a score of 0.792.

When it comes to the values of the rest of the variables, these rank as follows: "The integrated waste management process contributes to achieving the environmental goals required to be achieved", ranked 4th in terms of importance to the focus group, with relative score of 0.784; then "There are many benefits to society through the integrated waste management process", with score 0.776; next, "The integrated waste management process is achieved in the development of the environmental sector" and "The integrated waste management process is in line with the development goals to be achieved" both reaching a relative score of 0.772. The last three were: "The Ministry of Environment aims to achieve sustainable development through many methods" with score 0.760, then "The efficiency of the integrated waste management process increases as a result of the increase in the efficiency of the control management method", with score 0.740, and lastly "The integrated waste management process meets the objectives of the Ministry of Environment in achieving sustainable development", reaching score 0.736.

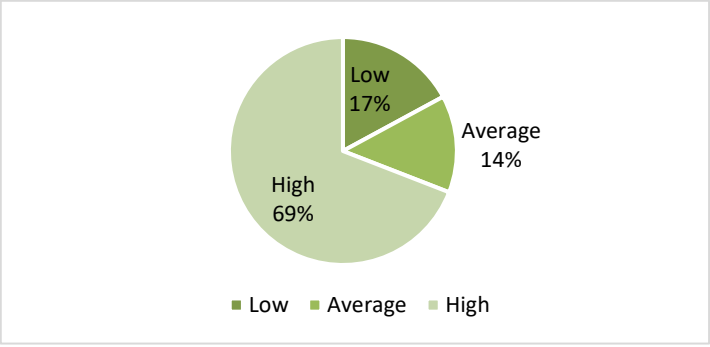

Figure 2. Axis levels of sustainable development

It is clear that the axis has been divided into 3 levels (high - medium - low) and it was found that for 69.1% of the sample, the focus of the study is in the high level, while 13.8% is in the middle level, while the low level consists of 17.1% of the sample, which shows the high level of the process of sustainable development from the point of view of the study sample individuals.

Study hypothesis test

"There is a positive relationship with statistical significance between the integrated waste management process and the level of sustainable development."

To ensure the validity of the study hypothesis, the study carried out the correlation coefficient test to study the correlation between the integrated waste management process and the level of sustainable development, and it was found that there was a significant direct correlation at the level of 0.01, which confirms the validity of the study hypothesis and that there is a direct impact of the integrated waste management process on the level of sustainable development, i.e. The higher the level of integrated waste management process, the greater the level of sustainable development achieved.

Table 3. Statistical significance at the level of significance 0.01

The variable	Integrated waste management process
Level of sustainable development	0.779

Source: Produced by the author, using the SPSS software.

6. Conclusions

The current article focused on the relationship between urban waste management as urbanization. What is more, the study also aimed at discovering how integrated waste management can help for a better development of a country per se. Thus, after releasing the survey, there were a series of variables that were taken into account, so as to prove the hypothesis. Therefore, in order to summarize some of the findings, these are:

- There is a great interest of officials in achieving high levels of integrated waste management process in the community;
- There is a high level of performance of the integrated waste management process from the point of view of the study sample group;
- There is a great interest of officials in achieving high levels of sustainable development in society;
- The high level of the sustainable development process from the point of view of the study sample individuals;
- There is a direct impact of the integrated waste management process on the sustainable development level.

All these variables come to aid the affirmation according to which "There is a positive relationship with statistical significance between the integrated waste management process and the level of sustainable development" thus, rendering, once more the hypothesis to be valid.

Acknowledgement

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References

[1] Allwood, J. M., Ashby, M. F., Gutowski, T. G., & Worrell, E. (2010). Material efficiency: A white paper. Resources, Conservation and Recycling, 55(3), pp. 362-381. Elsevier B.V. DOI: 10.1016/j.resconrec.2010.11.002.

[2] Bhandari, R., Saptalena, L. G., Kusch, W. (2018). Sustainability assessment of a micro hydropower plant in Nepal. Energy. Sustain. Soc. 8, 3. https://doi.org/10.1186/ s13705-018-0147-2.

[3] Biswas, I., Raj, A., Srivastava, S. K. (2018). Supply chain channel coordination with triple bottom line approach. Transport. Res. Part E Logist. Transp. Rev. 115, 213e226. https://doi.org/10.1016/j.tre.2018.05.007.

[4] Brundtland, G. H., Khalid, M., Agnelli, S., Al-Athel, S., & Chidzero, B. (1987). Our common future. New York, 8.

[5] Chang, D. L., Sabatini-Marques, J., da Costa, E. M., Selig, P. M., Yigitcanlar, T. (2018). Knowledge-based, smart and sustainable cities: a provocation for a conceptual framework. J. Open Innov. Technol. Mark. Complex. 4, 5. https://doi.org/10.1186/ s40852-018-0087-2.

[6] Depken, D., Zeman, C. (2018). Small business challenges and the triple bottom line, TBL: Needs assessment in a Midwest State, U.S.A. Technol. Forecast. Soc. Change 135, 44e50. https://doi.org/10.1016/j.techfore.2017.05.032.

[7] ECOTEC Research and Consulting Ltd. (2000). Beyond the bin: The economics of waste management options. Retrieved from www.foe.co.uk/resource/reports/ economics_waste_options.pdf.

[8] El-Haggar, S. M. (2007). Sustainable industrial design and waste management: Cradle-to-cradle for sustainable development (p. 424). Oxford: Elsevier/Academic Press.

[9] Halati, A., He, Y. (2018). Intersection of economic and environmental goals of sustainable development initiatives. J. Clean. Prod. https://doi.org/10.1016/j.jclepro. 2018.03.322.

[10] Kim, S.-J. (2002). Korean waste management and eco-efficient symbiosis − a case study of Kwangmyong City. Clean Technologies and Environmental Policy, 3(4), pp. 371-382. DOI: 10.1007/s10098-001-0124-9.

[11] Reijsen, J. van, Helms, R., Batenburg, R., Foorthuis, R. (2015). The impact of knowledge management and social capital on dynamic capability in organizations. Knowl. Manag. Res. Pract. 401e417.

[12] Sachs, N. (2006). Planning the funeral at the birth: Extended producer responsibility in the European Union and the United States. *Harvard Environmental Law Review*, 30(51).

[13] Seadon, J. K. (2006). Integrated waste management-looking beyond the solid waste horizon. Waste management, 26(12), pp.1327-36. DOI: 10.1016/j.wasman.2006.04.009.

[14] Singh, S. K. (2019). Territoriality, task performance, and workplace deviance: Empirical evidence on role of knowledge hiding. J. Bus. Res. 97, 10e19. https:// doi.org/10.1016/j.jbusres.2018.12.034.

[15] Singh, S. K., El-Kassar, A.-N. (2019). Role of big data analytics in developing sustainable capabilities. J. Clean. Prod. 213, 1264e1273. https://doi.org/10.1016/j. jclepro.2018.12.199.

[16] Skumatz, L. (2008). Pay as you throw in the US: implementation, impacts, and experience. Waste management, 28(12), 2778-85. Elsevier Ltd. DOI: 10.1016/j.wasman. 2008.03.033.

[17] Suttibak, S., & Nitivattananon, V. (2008). Resources, Conservation and Recycling Assessment of factors influencing the performance of solid waste recycling programs. *Conservation And Recycling*, 53, 45-56. doi: 10.1016/j.resconrec.2008.09.004.

[18] Tudor, T., Robinson, G., Riley, M., Guilbert, S., & Barr, S. (2011). Challenges facing the sustainable consumption and waste management agendas: perspectives on UK households. *Local Environment*, 16(1), 51-66. DOI: 10.1080/13549839.2010.548372.

[19] U.S. Environmental Protection Agency. (1995). Decision-makers' guide to solid waste management, volume II. Washington, D. C. Retrieved from http://www.epa.gov/ osw/nonhaz/municipal/dmg2/.

[20] U.S. Environmental Protection Agency. (2010). Reduce, Reuse, Recycle. Wastes - Resource Conservation. Retrieved January 5, 2011, from http://www.epa.gov/ wastes/conserve/rrr/.

[21] U.S. Environmental Protection Agency. (2010). Reduce, Reuse, Recycle. Wastes - Resource Conservation. Retrieved January 5, 2011, from http://www.epa.gov/ wastes/conserve/rrr/.

[22] UC Davis. (2008). The 4 R's of waste reduction.

[23] Yang, J., Yuan, M., Yigitcanlar, T., Newman, P., Schultmann, F. (2015). Managing knowledge to promote sustainability in Australian transport infrastructure projects. Sustain. Times 7, 8132e8150. https://doi.org/10.3390/su7078132. Yigitcanlar, T., 2011. Position paper: redefining knowledge-based urban development. Int. J. Knowl. Based Dev. 2, 340e356.

[24] Zhang, W., Padmanabhan, P., Huang, C.H. (2018). Firm level offshoring activities, pollution regulation, triple bottom line, and market structure: What do they have in common? J. Clean. Prod. 195, 618e624. https://doi.org/10.1016/j.jclepro. 2018.05.232.

[25] Zheng, X., Li, L., Zhang, F., Zhu, M. (2019). The Roles of Power Distance Orientation and Perceived Insider Status in the Subordinates' Moqi with Supervisors and Sustainable Knowledge-Sharing. *Sustainability*, 11, 1421. https://doi.org/10.3390/ su11051421.

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Sustainability through Learning and Development in Outsourcing Sector

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Abstract

Sustainability is a goal easily called out in business presentations, not only that is a unique selling point, but mostly that is becoming one of the differentiations in any industry and furthermore, it is that one element that will create the added value to the culture of a company. Studies even claim and prove a higher market share on such companies that have adopted sustainability as a business practice. Whether we are looking at geographies, specific industries or people's preferences, we have the same common drive, which is sustainability. Businesses are facing multiple challenges, now after the recent lockdown and economical shock in dealing with the current employment context.

Our main objective for this paper is to analyse the connection between learning, development and businesses mainly for outsourcing sector and how this connection can bring sustainability to companies in the future. Moreover, based on an industry-specific questionnaire, we shall try to avail some of the practices and measures taken to predict and nurture a sustainable business for the future.

The outsourcing industry where the speed of business models, demand and client variety is in a constant change, education for the people and for the upcoming generations is a continuous focus and effort for the future of a sustainable business.

Expectations post investigation on the specificities of the service industry are that new models of sustainability towards education are being designed, implemented or in the midst of creation, to adapt to a business healthy environment.

Keywords: sustainable business, learning and development, outsourcing sector, service industry.

JEL Classification: M5, L20, L80

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1. Introduction

Learning and development practices (L&D) in the organizations may be considered as being part of their centre of future development. Through L&D practices, companies may enable the individuals and also the companies to fulfil their personal and organizational goals. These processes render a significant contribution to the transformation of individuals and companies (Jamshid Ali Turi et. al., 2019). L&D as a field of management research and practice is concerned in terms of how individuals either singly or in groups acquire a sense of obtaining something that already exists or is created in the sense of making something completely new (Kapur R., 2020). Using L&D, individuals increase their knowledge and skills, and this will lead to an increase in their productivity and of their future occupational role. Being in a continuous learning process as an individual and as a company, it is the premise of a sustainable business model.

The current paper is going to focus on one main aspect of the business sustainability in the current context (Covid-19 context) namely the learning and development practices. As a starting point, in the current paper there will be some aspects brought into discussion with regards to the business practices and understanding of the L&D elements in wider business context and more specifically in the outsourcing sector. This will be comprised in a brief and relevant literature overview, followed by a narrowed down observation of the learning clusters in the current context and lastly, providing a visual exemplification of the current and actual transfer of knowledge flow towards the industry, which may already address the aspects of business sustainability as an overall observation.

In addition to the theoretical aspects, the aim of this paper is to analyse the responses captured through a questionnaire on the L&D activities linked to the relevant economical agents for the outsourcing industry and some findings to prepare us for the future business environment, and finally propose a new model of sustainability through L&D practices, as part of the final conclusions of this paper.

2. Outsourcing Sector in Romania

In the past years, outsourcing became an essential part of many businesses. Outsourcing is an effective business tool that can increase the efficiency of companies, the competitiveness and profitability. It helps companies to develop and evolve, regardless of theirs size and type of activity.

More, companies started to delegate outsource jobs to other countries, which are culturally and geographically close (Katarzyna Budzyńska, 2017). In Europe, the trend is from Western Europe to Central and Eastern Europe (CEE). Such situation can also be seen in Romania, where service centres that work for clients mainly from Western Europe started to open and Romania became a very attractive pole for outsourcing businesses. The country became a top location in EU because of the quality of workforce, the cost of doing business, the good investment climate, the flexibility of people to adapt to different business cultures, and quality of life.

Romania is the one of the leading destinations in EEC for Business Process Outsourcing (BPO), Information Technology Outsourcing (ITO), Research and Development (R&D) or Shared Services (SS). The main locations for outsourcing businesses are: Bucharest, Cluj-Napoca, Iaşi and Timişoara. The Association of Business Service Leaders in Romania (ABSL) reports a number of approximately 265 companies in outsourcing sector and around 125,000 employees. These numbers make Romania the second most important country in the EEC region in terms of size of outsourcing sector, after Poland.

A.T. Kearney measures every year an index that compares the outsourcing sector dynamics for 50 countries. Historically, this measure has been based on metrics within three major categories adding digital resonance in 2019 report: financial attractiveness (35%), people's skills and availability (25%), business environment (25%) and digital resonance (15%). After introducing the digital resonance variable in the index composition in 2019, Romania has worsen its rank as compared to 2017, dropping 10 positions, thus being the 7th country in EU in terms of attracting outsourcing businesses and the 28th in the world from a top of 50 countries. In 2019, Romania improved its financial attractiveness, people's skills and availability, the country environment and infrastructure and also the cultural adaptability. Romania has worsen its situation mainly because of the digital resonance variable which takes into account aspects such as: digital skills of the labour force, legal adaptability, meaning the extent to which the legal framework takes digital business models into account, the amount of corporate activity, digital outputs, including creative outputs, as well as knowledge and technology outputs.

In order to grow in ranking, Romania has to work on all these topics in the next years and this could be possible only by the support of the Government creating the appropriate legal framework and, most importantly, through learning and development practices (L&D). Taking into account the current crisis, it will be challenging for the outsourcing sector in Romania to find the perfect mix in order to evolve in a sustainable way in the future.

3. Problem Statement

Bearing in mind that we are in a context of unforeseen (future) consequences and the current status quo of the global economy is unlikely to be predicted in a certain and truly reliable design, unable to name and printout all aspects or implications due to Covid-19, this paper and topic under discussion has made an attempt to unveil some of the unknown concepts, and test the readiness and openness to the future uncertainties. More specifically, the L&D practices are taken a step further and brought to the level that has been developing for the past years, as a pillar for sustainable business.

Multiple sources are addressing aspects like L&D, education, corporate social responsibility (CSR) and other human bound elements for a sustainable business, as knowledge and transfer of knowledge are the heritage of a sustainable business.

Outsourcing sector is defined by the transfer of knowledge, meaning

transactional and procedural activities having at the core a certain level of skills and knowledge requirement. While some articles talk about the skills that make a person employable, Foerester-Pastor and Golowko (2017) have conducted a research on the employability skills needed for the outsourcing sector, where various aspects were captured and analysed as relevant to gathering skilled and capable human assets. As per their key results, one personal attribute considered relevant, and also with an impact on this research, is the learning attitude.

If the skills are mapped and easily understood, there are also studies talking about knowledge. Knowledge has been extensively analysed and clustered in various notions and terms, for example in terms of tacit and explicit knowledge. According to R. Muthuveloo et al. (2017), tacit knowledge is defined through 4 major dimensions that were considered in their research as influential factors determining organisational performance and hence a recommended practice, at least for 2 determining dimensions, namely socialization and internalization.

Edvardsson and Dust (2020), for readers' wisdom, propose in their research a review of 42 sources that are linked and would bring some data and facts on various learning and knowledge management concepts, specific for the outsourcing sector. Here once more, tacit and explicit knowledge reappears as a key element, which has also inspired the below knowledge transfer design, as a visual flow. Figure 1 is the contribution of the authors to the research underlying this paper, yet appreciating the knowledge linked to explicit and tacit knowledge concepts, available in the above named sources.

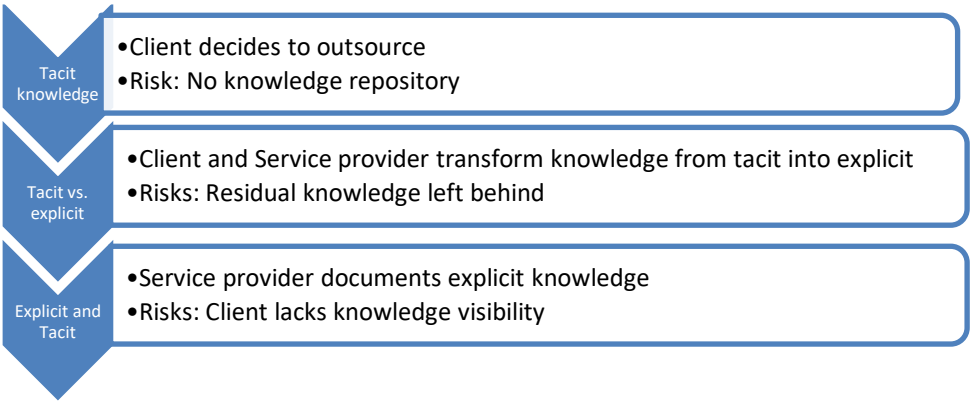

Figure 1. Tacit and explicit knowledge transfer in Outsourcing. A High-level flow (authors' development)
Source of inspiration: Edvardsson and Dust (2020): The Knowledge and Learning Potential of Outsourcing

Some recent studies and reports conducted by Ipsos-Future of Jobs (2020) on the local Romanian labour market and a global research offer a perspective of the current times, elaborated by The Adecco Group–Resetting Normal: The definition of a New Era of Work (2020) brings information relevant for the future of outsourcing sector.

Ipsos has identified 6 behavioural stages during Covid-19, where, as a finding, 2 of the stages are more present in the overall population, meaning amongst the 4,221 respondents from across industries like: production, services and other administration/support sectors. Resistance stage is at 30% of the respondents, meaning that they are awaiting that life will just go back to normal, as it was, and Anticipation stage at 25%, where respondents are recreating new priorities and habits for the unknown future.

Adecco, while looking at 8 countries across the globe and 8,000 respondents (1,000/ country) is considering in the structure of the study the time element as the 3 essential moments: pre-pandemic, during pandemic and post pandemic, hence to better understand 5 key elements that have emerged in the new work era. The flexibility, working hours, new leadership, further development and trust equation are the dimensions under concern and the responses have revealed some interesting facts on the behavioural aspects of the employer and the employees, at a global level, as well as at country level.

While extracting the wisdom of the two reports mentioned above, there are some common elements which predict the future: digital and remote working skills (69%) and support for working on platforms/systems (65%) are priorities in terms of training needs at a global level, while locally, 2 of the main challenges that the labour market / employees have to face are personal development (19%) and learning new ways of working (16%), while exercising social or physical distancing. Because of the changing requirement of the external world, companies should keep adapting their strategy, which needs continuous information gathering and processing and these all are possible through continuous organizational learning and development (Pietrzak and Paliszkiewicz, 2013, Kark et al., 2020). Under such a challenging work setup, the research proposed in this paper is to better understand the business sustainability from an L&D perspective and what considerations are to be further developed and adapted.

4. Aims of the Research and Research Methods

Through the current research, the purpose is to take the pulse of the market and of the outsourcing industry on the readiness of investing and continuing to provide L&D services and activities for a sustainable business model.

The expectation of the research is that the sector is ready and willing to adapt, while some of the current practices of learning will impose a paradigm shift, something which may take time and new tools. Once having the infrastructure set up, the last element which needs to make the final shift would be the human element, meaning the "buy in" of the people at all levels and business relations.

The method selected in the current paper was the questionnaire method based on 17 questions designed to capture the embedded practices of the organisations, understand the relevant concepts of this paper and also to assess the appetite for L&D practices as an overall business approach, mainly inculcated into the business culture. Throughout the questionnaire there are elements that can predict the readiness to adapt into the new online, the virtual way of providing access to

learning or even other means of activities for a sustainable business.

Targeted respondents were from the major players to offer a pertinent view of the investigated data, they are top international companies and also they retain around 9% of the employees from the outsourcing sector in Romania. The data was collected between August 7th and August 21st, 2020. Fifteen respondents elected were from the BPO sector or partners of services, relevant for collecting predicting data. The average duration to fill in the questionnaire was 10 minutes and the questions where created with various options: multiple or single choice option, ranking scales and free text. The questions were focused on the strategy of the company regarding L&D practices, the current and future investment in L&D, the culture of the company regarding L&D and corporate social responsibility actions.

5. Findings

In terms of relevance to respondents, the results came in from a reliable and qualitative representative population, with a mix between Owners / CEO / General Managers as one category, People Managers as a distinctive one and a third category, Individual Contributors with strategic decision roles, in the top hierarchical structures. 3% of them are currently engaged in business roles with companies with more than 500 employees, as a total headcount, as in figure 2.

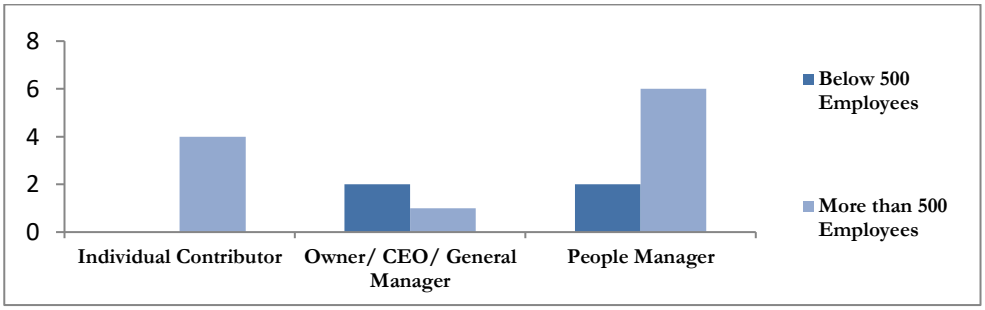

Figure 2. Distribution of roles and size of company of respondents

After testing and investigating past practices, before pandemic, the results have concluded that 100% of the participants to the questionnaire have the L&D practices as part of their company's culture, while 93% also confirmed the existence of a policy/strategy dedicated to sustain the culture of learning for a sustainable business model and the same 93% confirmed that the BPO sector invests in the L&D practices, as a rule.

While the majority of the respondents do value L&D practices and have a strong attachment to them, they have not confirmed any significant financial increase from 2018 to 2019, just to get a better understanding of the past practices and priorities. In the figure 3 below, it is obvious that the majority have mentioned "No change" in the financial allocation for L&D, in the comparison between 2018 and 2019.

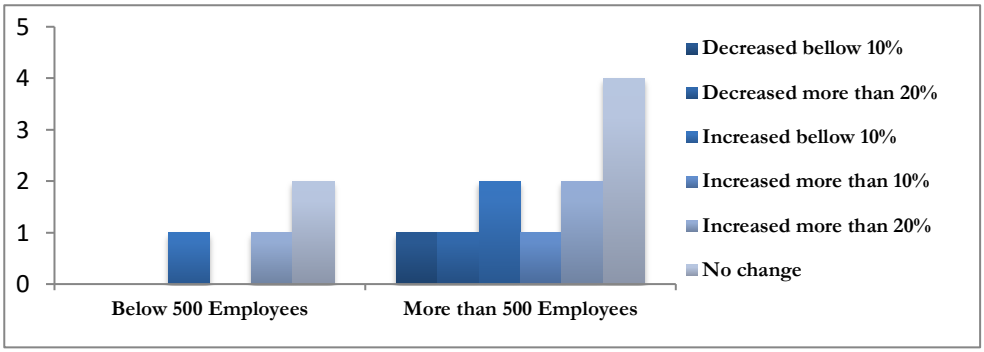

Figure 3. Budget allocation for L&D comparison between 2018 and 2019

In a context of quite a rigid market for L&D investments, 53 % of the respondents are expecting an increased interest in the development areas, education/upskilling/growth at work, while only 24% foresee a readiness for financial investments, as opposed to 67%, ready to enable internal knowledge up-skilling as an immediate option to support the future of the business and ensure sustainability.

As sustainability is often seen as *invest today for tomorrow's results*, Corporate Social Responsibility (CSR) with a focus on education is also part of the areas of the BPO strategy. Here too, 100% of respondents have personally been involved or are active in CSR projects, focused on L&D and many share personal knowledge in a community as a trainer or share best practices within a structured external forum, to bring a long term contribution on business sustainability. 93% consider that supporting and investing in educational programmes, as part of CSR, is in the core strategy of the BPO culture.

In the last question #17, the questionnaire is testing the expectation setting and readiness for the future; we see a 40% readiness to adapt online to a mix of learning options, whether virtual content (self-paced) or instructor-led content, as an online session. On the other end, 6% still believe and accept the classroom classical delivery, yet the curiosity of the results is at the 9% of "Others". This is a major result and outcome, as some of the proposed models are not there yet, are hard to be called out due to a lack of "title" and are just now in the making or becoming the next learning models. To emphasise more, the next is a quote from one of the respondents: "*not yet invented. Online is just a phase into something else".*

6. Conclusions

The targeted respondents were those which are more exposed to offering service solutions to the wider market. In such a context, the readiness of these companies into adapting fast with internal knowledge, capable employees and with the overall knowledge ecosystem is key for the sustainability of their services. This means that not only the content will be considered relevant, but a wider factor of data like: best channels to deliver, best technology to implement, adapted experiential learning,

while in online or virtual sessions the challenges just pile up once we open the depth of these levels.

Such companies, in our view, are bound by moral and business ethics and practices to be pilots, innovators and also designers of services and solutions, real knowledge mechanisms for growth, to ensure and support the business sustainability in the new era. The new era is as per some respondents of the questionnaire something that is not yet here, and such new normality is not yet known to us. The transition phase we are in is a metamorphose of the future roles, knowledge and real human assets and values pertained into the employees of the future, into the roles which we not yet know of and maybe even in the way we would relate to such a topic and Learning and Development.

We dare saying that such a new future can be anything from a knowledge helmet attached to the forehead, to a Nano sized data chip inserted in the human-system, or robots taking over the more procedural and transactional knowledge and tasks, but one thing is for sure: personal touch, human interaction and survival instinct cannot be made obsolete, or better yet, we as professionals cannot let it become obsolete. It is difficult and challenging to maintain a sense of personal connection and belonging to the culture of a company when not nurtured and "lived" in person. While collaboration has become more effective as most of studies claim that productivity increased during lock-down, the work became only task oriented collaboration and not the kind that creates opportunities for informal learning and mentoring. Companies which will find ways to reinvent themselves and will find ways to renew personal bonds will experience significant benefits in terms of employees' satisfaction, engagement, retaining talent and increased standard of living for employees. What is for sure is that organizations should develop a culture of trust, the trust employees have in the decisions of companies and their ability to navigate from the current economic crisis and the trust of companies in their employees and their willingness to work and evolve. This can create sustainable business that can bring value added to the society and could be the key in this changing working environment. At the same level with trust, a new business model should incorporate flexibility in the working policies in companies and more than this flexibility in the mind-set of the employees who should be ready to adapt and to accumulate new knowledge and skills.

References

[1] ABSL (2020). ABSL Outsourcing industry Reports, Retrieved from https://www.absl.ro/press-room/#99-134-absl-outsourcing-industry-reports.

[2] The Adecco Group (2020). Resetting normal: defining the new era of work, Retrieved from https://www.adecco.ro/wp-content/uploads/2020/06/Reset-Normal-Global-Report.pdf.

[3] Edvardsson, I. R., Durst, S. (2020). Caper 3. *The Knowledge and Learning Potential of Outsourcing.*

[4] Foerster-Pastor Foerster-Metz, U. S., & Golowko, N. (2017). Employability skills for the Romanian outsourcing industry. *Proceedings of the International Conference on Business Excellence, Volume 11* (Issue 1).

[5] Katarzyna, B. (2020). Sector business process outsourcing in Visegrad Group, *Int. J. Innovation and Learning*.

[6] Kark et al., COVID-19: People, technology, and the path to organizational resilience, Retrieved from https://www2.deloitte.com/global/en/pages/about-deloitte/articles/people--technology--and-the-path-to-organizational-resilience.html.

[7] Kapur, R. (2020). The Practice of Learning and Development in Organizations Retrieved from https://www.researchgate.net/publication/339200211_The_Practice_of_Learning_and_Development_in_Organizations.

[8] Kearney, A. T. (2019). Digital resonance: the new factor influencing location attractiveness - The 2019 Kearney Global Services Location Index, Retrieved fromhttps://www.kearney.com/documents/20152/4977724/Digital+resonance+the+new+factor+influencing+location+attractiveness.pdf/7a39643a-dc22-87f5-936b5e734999f57d?t=1581025251793.

[9] Ipsos (2020). Viitorul pieței de muncă din România, Retrieved from https://www.ipsos.com/ro-ro/viitorul-pietei-muncii-romania.

[10] Muthuveloo, R., Shanmugam, N., & Teoh, A. P. (2017). The impact of tacit knowledge management on organizational performance: Evidence from Malaysia. *Asia Pacific Management*, Review 22, pp. 192-20.

[11] Pietrzak, M., Paliszkiewicz, J. (2013). Framework of Strategic Learning: the Pdca Cycle. *Warsaw University of Life Sciences*, Poland.

[12] Jamshid Ali Turi, Shahryar Sorooshian, Yasir Javed (2019). Impact of the cognitive learning factors on sustainable organizational development, *Heliyon*, 5 (2019) e02398.

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An Intra-Residential Smart Metering System – Design and Implementation

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Abstract

The purpose of this paper is to describe an intra-residential smart metering system capable of differential metering of individual equipment, as it was designed and implemented as a prototype during the "Intelligent system for trading on wholesale electricity market" (SMARTRADE) project. The proposed system is capable of data acquisition, primary processing, aggregation, long-term storage, and complex data analysis. The hierarchical design is intended to cover the area of a large residential area / large building / building complex.

Keywords: smart metering, edge computing, scalability, Internet of Things.

JEL Classification: C8, Y10

1. Introduction

Residential smart metering systems are designed to ensure the measurement of electricity consumption in an apartment, house or building, thus ensuring a sufficiently fine measurement granulation for companies that sell electricity, but insufficient if a micro-analysis of the consumption is desired - we mean analysis of the consumption profile for each electrical consumer inside a building.

One can also conceive the use of the commercial residential smart metering systems for this purpose, but this way of working would be impractical, due to costs, complexity, and volume occupied by the measuring equipment (Alskaif & Van Sark, 2016).

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For this reason, in order to obtain a finer granulation of the measurement, most of the time one should not use residential smart metering systems, but composite smart home systems that also include components capable of measuring individual consumption.

The purpose of this paper is to describe the design and implementation of an intra-residential smart metering system, capable of differential measurement up to the level of individual equipment.

2. Problem Statement

The minimum requirements that such a system should meet, as it was established during the design phase, are the following:

- Scalability - the system should be able to expand or shrink easily, depending on the number of electricity consuming equipment in the residence.
- Price - taking into account that the usual financial resources of a residence do not compare to those of an organization/enterprise, the total cost of holding (acquisition and exploitation) the system should be small.
- Multiple visualization modes – various data visualization ways should be available so that it can be easily interpreted (e.g., instantaneous consumption level, average consumption, total consumption, at the level of single consumer equipment, at the level of the residence, in the form of a graph, in tabular form, comparative analysis, prediction, etc.) (Kajáti, Miškuf, Ulbricht, & Zolotová, 2018)
- Data analysis - the ability to perform data analysis operations at various levels and of various complexities.
- Interoperability and portability - the data collected and analysed by the system should be available in various forms to the residential user. Hence, the need for at least the final results of the analyses to be available online / on PC/smartphone/tablet, etc., regardless of the operating system and browser used. Also, the primary data should be available for analysis using various data processing applications. Another facet of interoperability would be the possible communication between the components of such a system and other components in the smart-home category.
- Flexibility - the system should be able to analyse data for the whole range of residential electrical equipment, from those with very low consumption, of the order of a few watts or milliwatts (e.g., night light, stand-by equipment), to those with relatively high consumption, of the order of kilowatts (e.g., air conditioners, washing machines, etc.).
- Open source - at least the software component of the system should be available in an open-source variant so that it can be easily adapted to the various requirements of residential users. Besides, the use of open-source software would probably also contribute to a lower TCO.
- Adjustable data sampling frequency - The time interval at which the data is taken should be adjustable, from very short time intervals (e.g., 1-10 seconds) to longer time intervals (30 minutes - a few hours) for one to be able to experimentally achieve the correct balance between a sampling frequency as high possible - to better track the evolution of equipment with high

consumption variability, and the storage space required for data storage - if we are trying to reduce costs, at least the components of the system that will deal with the primary data collection and processing may not have very high performance and storage capacity.

- Ease of use − at least the final visualization components of the analysed/ aggregated data should be easy to use for the average user.
- Super-scalability − systems of this type should be able to be further aggregated into larger systems, which will achieve the accumulation/analysis of data at the level of the residential complex or maybe even more. Fulfilling this requirement would increase the cost requirements and would require the addition of additional levels to the proposed system. Ideally, such an additional level should consist of a single, optional subsystem that achieves this purpose only − the operation of subordinate systems should not depend in any way on its operation.

3. Design and Implementation

The system proposed in this report consists of two distinct layers:

- Primary Data Acquisition and Processing (PDAP) subsystem. Subsystems of this type are designed to cover the level of a small residence/building. The requirements covered are the above, less the requirement of super-scalability and partly those of data visualization, data analysis, and respectively interoperability and portability.
- Aggregation, long-term storage, and complex data analysis (ASDA) subsystem. This subsystem is designed to cover the level of a residential complex / large building / complex of buildings. The covered requirements are super-scalability and, in part, data visualization, data analysis, and interoperability, and portability.

The structure of the proposed system is represented in Figure 1.

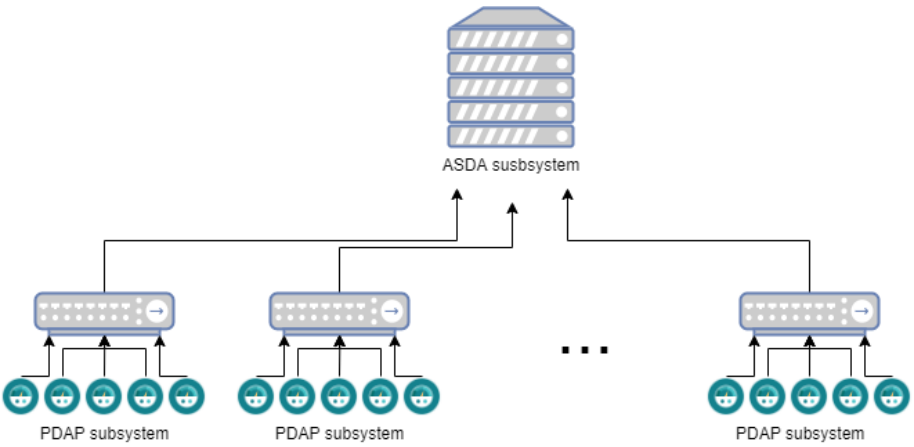

Figure 1. The structure of the data measurement, storage, and analysis system, overview

4. Primary Data Acquisition and Processing (PDAP) subsystems

The primary data acquisition and processing subsystems should contain two types of components:

- Intelligent components for measuring the consumption of equipment, to ensure the data acquisition function of the PDAP subsystem.
- A component of short-term storage and primary analysis of data to ensure the control part of the PDAP subsystem.

A diagram of the PDAP subsystem is shown in Figure 2.

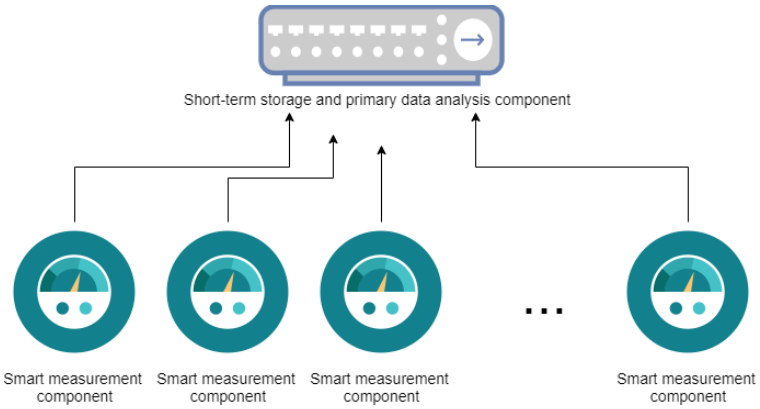

Figure 2. The PDAP subsystem diagram

4.1. The smart measurement component

For the smart measurement components, three possible technical implementations were available:

First alternative. Using various types of analogical sensors, such as current and voltage sensors. Analog sensors can be used with any system that can acquire data in the analogical format. The disadvantage is that the sensors of this type transfer data only by cable, only in analogue format, the installation is more complex (the sensors are placed on the power cords of the tracked equipment) and can prove complicated for an individual without basic knowledge on electronics.

Second alternative. Using IoT current and voltage sensors, such as the one described in (magLab, 2020). Sensors of this type are digital sensors, IoT integrated so they can be used with any connected system.

On these two alternatives, the value of consumed power would be obtained by calculation, from the values of current and voltage, respectively.

The advantage of using this alternative is obtaining more complex information (voltage and current instead of power), thus being able to also track the quality of supplied electricity.

Third alternative. Using smart plugs. Smart plugs are equipment used to measure power consumption. Smart sockets are interposed between the consumer and a regular socket, thus offering the advantage of easy use. Other advantages of

using this type of data acquisition are the fact that the data is provided in digital format, the data transfer is done wirelessly and some of these also have data processing and control facilities.

Following the comparison of the two working variants in terms of advantages and disadvantages, for the PDAP subsystems, we decided to use smart sockets.

We decided to use the products provided by TPLink (TP Link, 2020) for the implementation of the system, for reasons related to the ease of configuration and the multiple ways of acquiring the data offered (both through the software of our product, freely available and separately, through the usage of an open-source script, thus managing to cover the criterion of using open source software for data acquisition, storage, and analysis).

4.2. The short-term storage and primary data analysis component

For the short-term storage component and primary data analysis, two main implementation options are also available:

First alternative. Use of microcontroller-based computers (small computing systems, based on the use of an 8/16/32 bit microcontroller; typical examples of such systems are Arduino Mega 2560, Arduino Uno, Arduino Nano, NodeMCU, Teensy, MSP430, STM32, PocketBeagle, Penguin, ESP8266, Particle Photon, etc.) (Buckley, 2018).

The advantages of using this variant are given by the very low cost, the very low consumption of electricity and in some cases, the very small size.

The disadvantages involved are related to the relatively low computing power of these systems, the need to write dedicated software for each application, the need to directly modify the software for an application reconfiguration, small memory, inability to support large applications such as database systems, in most cases, the lack of an operating system, etc.

Second alternative. Use of a single-board computer (complete computer systems, built on a single circuit board, with microprocessor, memory, input/output system and other features needed for a functional computer; typical examples of such systems are Raspberry Pi 3, Asus Tinker Board, ODroid XU4, Banana Pi-M64, NanoPi NEO4, Rock64, Libre Computer AML-S905X-CC, LattePanda Alpha 864, UDOO X86 ULTRA, NanoPC-T3 Plus, HiKey 970, Parallel) (Kimari, 2019) (ZDNet.com, 2019).

Given the advantages and disadvantages listed and the fact that the APPD subsystems must operate autonomously and provide the features listed earlier in this paper, we chose to use single-board computers. Taking into account other factors, such as price and direct availability on the Romanian market of the electronic components, for the implementation of the system prototype, a single-board computer type Raspberry Pi 3, model B+ was used (RaspberryPi.org, 2019).

This choice of the computing system to be used for the PDAP subsystems implies that there is enough storage space on these computing systems to store a significant amount of data - Raspberry Pi 3, model B+ has a MicroSD slot compatible with high capacity cards (64-128 GB) (Raspberrypi.org, 2020). Part of

this space will be occupied by the Raspbian operating system (approximately 8 GB) (Raspberrypi.org, 2020) and a smaller part will be occupied by the various applications required but, on a 64 GB card, approximately 50 GB will remain available for storage. More than enough space for storing a large number of measured values (at a sampling rate of 1 measurement every 30 seconds and considering an approximate size of 1,000 bytes per record, the storage space required for the data provided by a single measuring component is about 1,000 MB per year, considering an APPD subsystem with 20 measuring components, it turns out that on such a card, data covering about 2.5 years of measurements can be stored locally). Based on these considerations, under normal circumstances, the use of cards with lower storage capacities (16-32 GB) can be considered to obtain a reduction in costs per APPD subsystem (on a 16 GB card, data for about 36 days of measurements can be stored, and on one of 32 GB, data for about 310 days of measurements, under the above conditions).

The software of the PDAP subsystem consists of:

- The operating system of the Raspberry Pi 3 single-board computer, model B+ is a Raspbian operating system, an open-source operating system derived from the Linux Debian distribution.
- Various scripts that were written in the Python language.
- A graphical data representation application called Grafana. Grafana allows the interrogation, visualization, warning, and understanding of the values of the available data, regardless of where and how they are stored. The main activity in Grafana is the creation, exploration, and sharing of dashboards containing different methods of visualizing data and analysis results.

The actual retrieval of data from the smart sockets and the writing of this data in the database were done with the help of several Python scripts created within the project. Python scripts are further run through batch files, with separate versions for Windows Command Prompt and bash.

The database used for the PDAP subsystem is a MySQL database consisting of 3 tables.

We opted for the separation of instantaneous consumption data, and statistical data related to daily and monthly use, in two different dashboards.

Grafana dashboards are composed of various types of panels. The first dashboard consists of 12 panels: operating time, status, LED status, Wi-Fi signal strength, instantaneous voltage, instantaneous intensity, instantaneous power, total energy consumed, voltage evolution over time, intensity evolution over time, evolution over time of power and the evolution over time of the total energy consumed (Figure 3).

Figure 3. The first dashboard of the PDAP subsystem

The second dashboard consists of two panels: monthly statistics and daily statistics (Figure 4).

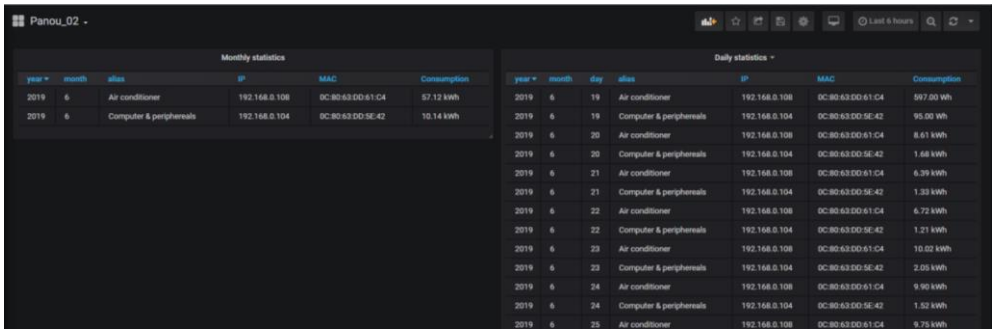

Figure 4. The second dashboard of the PDAP subsystem

5. Aggregation, Long-Term Storage and Complex Data Analysis Subsystem (ASDA)

The ASDA subsystem is a system that operates autonomously over the PDAP layer, depending on it only insofar as they constitute the source of data to be stored and analysed.

Such a subsystem can be designed both in the older paradigm of the supervisory system model but also by following the newly introduced concept of intermediate data processing − fog computing. This concept was introduced in 2012 by (Bar-Magen Numhauser, 2012) and standardized in 2018 by (IEEE Standards Association, 2018).

Taking into account the specifics of the project and in terms of multiple advantages (better use of existing computing resources, decongestion of traffic in

the central area of communications systems, reducing latency of representation and response, etc.), upon the implementation of the ASDA system we opted for a fog-computing solution. Taking into account the target characteristics (mainly the use of open source applications), the software chosen for implementation was FogLAMP.

FogLAMP is an open-source platform for IoT and a component to be used in fog computing. It uses a modular microservice architecture, which includes the collection, storage, processing, and transmission of historical sensor data to Enterprise systems and cloud-based services. FogLAMP can run in highly available, standalone, unsupervised environments, assuming insecure network connectivity. FogLAMP provides a modular and distributable framework under the open-source Apache v2 license. The modules can be distributed in any layer of the IoT ecosystem − Edge, Fog, and Cloud − and work together to provide scalability and resilience.

6. Conclusions

The current paper attempted to sketch the way a fine-grained monitoring system can be implemented for monitoring the electricity consumption data of various existing equipment in a residential or organizational context.

It outlines the requirements that should be met and a technical proposal is presented to ensure that these requirements are met while providing the desired functionality.

The conclusion is that such a system should be implemented as a multi-level fog-computing system in which the Edge level is provided by autonomous subsystems and the Fog level is implemented through a cluster of various type computers. Data storage, analysis, and primary visualization are implemented separately in the Edge area (consisting of PDAP subsystems, in the context of this paper), and the Fog area (referred to as ASDA, in the context of this paper) is based on a local cluster.

A final comment is that it should be preferred that both the Fog area and the Edge area, although having separate implementation and functionality, run a common stack of services, such as FogLAMP.

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References

[1] Alskaif, T., & Van Sark, W. (2016, 08 31). *D1.4 – Smart grid roll-out and access to metering data: state-of-the-art.* Retrieved from Parent-Project.eu: https://www.parent-project.eu/wp-content/uploads/D1.4_Smart-grid-roll-out-and-access-to-metering-data-1.pdf.

[2] Bar-Magen Numhauser, J. (2012). Fog Computing introduction to a New Cloud Evolution. Escrituras silenciadas: paisaje como historiografía. *Escrituras Silenciadas: Paisaje Como Historiografía / José Francisco Forniés Casals (Ed. Lit.), Paulina Numhauser (Ed. Lit.), Proceedings from the Cies Iii Congress* (pp. 111-126). Alcala: Proceedings from the Cies Iii Congress.

[3] Buckley, I. (2018, 02 02). *6 Best Arduino Alternative Microcontrollers.* Retrieved from MakeUseOf.com: https://www.makeuseof.com/tag/best-arduino-alternative-microcontrollers/.

[4] IEEE Standards Association. (2018, 08 02). *IEEE 1934-2018 - IEEE Standard for Adoption of OpenFog Reference Architecture for Fog Computing.* Retrieved from Standards.IEEE.org: https://standards.ieee.org/standard/1934-2018.html.

[5] Kajáti, E., Miškuf, M., Ulbricht, I., & Zolotová, I. (2018). Comparison of Cloud IoT Platforms for Smart Metering Solution Based on NodeMCU. *WSEAS*, volume 15.

[6] Kimari, K. (2019, 01 30). *5 of the Best Raspberry Pi Alternatives in 2019.* Retrieved from MakeTechEasier.com: https://www.maketecheasier.com/raspberry-pi-alternatives/.

[7] magLab. (2020, 08 28). *IoT Current and Voltage Sensor.* Retrieved from magLab: https://www.maglab.ch/products/iot-current-and-voltage-sensor/.

[8] RaspberryPi.org. (2019, 01 01). *Raspberry Pi 3, Model B product brief.* Retrieved from RaspberryPi.org: https://static.raspberrypi.org/files/product-briefs/Raspberry-Pi-Model-Bplus-Product-Brief.pdf.

[9] Raspberrypi.org. (2020, 08 28). *Formatting an SDXC card for use with NOOBS.* Retrieved from Raspberrypi.org: https://www.raspberrypi.org/documentation/installation/sdxc_formatting.md.

[10] Raspberrypi.org. (2020, 08 28). *SD cards.* Retrieved from Raspberrypi.org: https://www.raspberrypi.org/documentation/installation/sd-cards.md.

[11] TP Link. (2020, 08 28). *TP Link HS110 Specifications.* Retrieved from TP Link: https://www.tp-link.com/en/home-networking/smart-plug/hs110/#specifications.

[12] Wifi Magazine. (2020, 08 28). *SCT013-000 Product Specification.* Retrieved from Wifi Magazine: https://wifimag.ro/pdf/Datasheet-SCT-013-000.pdf.

[13] Wifi Magazine. (2020, 08 28). *SCT013-030 Split core current transformer.* Retrieved from Wifi Magazine: https://wifimag.ro/pdf/SCT013-030-0-30A-0-1V.pdf.

[14] ZDNet.com. (2019, 01 02). *The best Raspberry Pi alternatives (2019 edition).* Retrieved from ZDNet.com: https://www.zdnet.com/pictures/the-best-raspberry-pi-alternatives-2019-edition.

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An Empirical Study: Training, Education and other Determinants Related to the Development of a Growth and Innovative Mindset - Essential in a Sustainable Business Context

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Abstract

This article examines the scientific and educational approach of the success and innovative mindset, essential for a sustainable business context in relation to recent global events.

The research considered the theoretical empirical developments as well as the practical dimension in which it had emerged.

The methodology consists of the examination of the dimensions related to the development of a growth mindset to improve performance in business and entrepreneurial leadership, such as vision, innovation and creativity, risk taking, charisma, proactivity, followed by an analysis from the cognitive science perspective about what seems to be the secret to success: an adjustable mindset and continuing life learning approach.

The first part of the article focuses on the theoretical explanation of the entrepreneurial business leadership concept in relation to several other disciplines in which it had developed, such as sociology, psychology, management, economics, business administration, strategy, finance, marketing, followed by an analysis of the importance of learning in contemporary business context.

Theories and thoughts of experts of the cross-cultural field are highly regarded, providing a detailed insight into the intrinsic motivational factors of success, the continued development of online learning, projected directions and trends within the contemporary transformational global business context.

Keywords: education, cognitive transformation, growth and success mindset, global business context, business performance, intrinsic motivation, sustainable business context.

JEL Classification: I25, I26

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1. Contemporary Business Landscape − the Most Challenging Learning Opportunity

The dynamic nature of the international markets in the context of globalization as we all witnessed, presented the businesses environment with a series of challenges and opportunities generated by the Covid-19 pandemic, which many countries are struggling to keep under control. Essential importance in reducing the spread of the virus by effective communication streams and equally promoting a safe recovery is attributed to the advanced technology and digitization, which played a key role in fighting this global pandemic. Entrepreneurs and business leaders remain focused on the evolution and the global healthcare response to the virus spread, in their attempt to revitalize the long-term economic health and achieve sustainability for their businesses. The successful business leaders are well aware that being ready for the future is not only a passive process of preparing and predicting, but a matter of vision and determination towards adopting a proactive strategy to shape the character of the business, by making far sighted choices (Gunther McGrath, MacMillan, 2000). In the knowledge-based economy, new entrants may have the ability to force the well-established market leading companies to redesign the business strategy as to better adapt their products and services to the current challenges in order to exploit opportunities appealing to the safety measures on the one side and the desires and intentions of people, on the another side. Today's entrepreneurs have to possess agility, clarity and professional attributes that enable them to identify the issues that ought to be addressed in the near and far sighted future, together with analytical capabilities of the global conditions, facilitating their decisions on diversification, expansion through connections with other businesses, market positioning on which their organization's future depends. It becomes apparent that the business consequences and contingencies are very dependable on the strategic decision makers, who are continually expected to rise up to the challenge and grow the companies by analysing the economic climate, forecasting future trends and efficiently responding to the challenges faced with (Handy, 1989). It could well be stated that the successful individuals are those who realize why the changes happen and discern what might be the appropriate direction, followed by conscious choices and welcoming the change in itself. This precise aspect it is believed to be the ingredient that fosters the development of a success and innovative mindset. Those individuals who manage to deal with the unknown in unprecedented conditions seem to be better able to control and overcome the sudden and unexpected evolution of events threatening to destabilize the presumed equilibrium of the status quo. The pillars of good strategic decision-making rest on strong human values - the best equipped, the most successful and long-surviving individuals are those who are well anchored in values that can hold them together in harsh circumstances and possess a set of determinants that do not change depending on the surrounding conditions. The current global events have been showcasing a high degree of volatility and tremendous challenges to take on. Looking at things from a different perspective, possessing strong values implies an analytical detachment

and the willingness to have own perceptions challenged and often have the courage to argue in favour of a new vision or strategic positions that may seem difficult to accept at times (Handy, 1989). Considering a more introspective approach, the degree and intensity of the emotional involvement comes from ones' internal motivation and passion, representing a crucial element to cognitive transformation, and may well be the key to a fulfilled life, as well as a successful business career.

Taking into account the continuous transformational character of the global environment, the secret of the successful individuals and strong business leaders lays in education, continuous training and sharpening of the management and professional competencies of their employees, as a long-term sustainable investment.

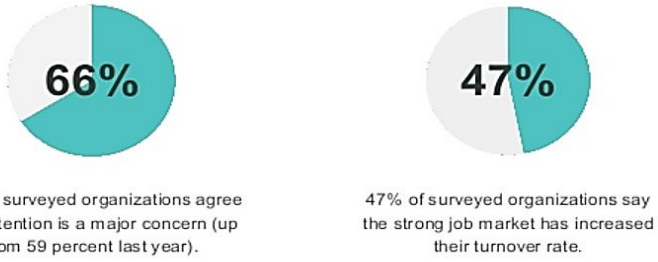

Figure 1. High Performance Engagement Report 2019

Source: McKinsey Global Survey https://www.slideshare.net/BizLib/3-key-elements-to-keeping-high-performers-engaged

The above report issued by McKinsey Global reflects the concern of major organizations pertaining to the workforce retention and the high rate of employee's turnover in their attempt of achieving business sustainability. While industry standards for containing the Covid-19 impact are slow to emerge, the world of work is being transformed by the upskilling and reskilling revolution made possible by the digitization of the learning process. Learning organizations and academic institutions focus their strategies to help people manage the challenges in this new unpredictable setting developing training programmes that anticipate the needs and rise above to help the society towards a positive and sustainable professional path. Traditional corporations and multileveled global organizations have been for the past years struggling to deal with uncertainty and maintain an optimized level of efficiency and profitability meanwhile various start-ups and young entrepreneurs have seized the opportunity and turned it into their advantage, by successfully launching their private businesses.

2. Determinants and the Importance of a Success and Innovative Mindset in Current Times

A growth and success mindset encompasses a set of character traits and skills which enable entrepreneurs to use the uncertainty for their benefit by identifying potential business opportunities in areas where others may not think of it as being possible. However successful these entrepreneurs might be

in their line of activity, nothing would be possible without a valuable set of the character traits backed by a lifelong learning mentality and ongoing sustained effort. Somehow, these individuals manage to remain extremely disciplined, being always in touch with the reality and continually analysing the business environment, the dynamic shifts in the economic conditions and the evolution of the markets. They seem to be organically attracted by challenging projects where their adaptive nature is better used in designing strategies and structure, rather than investing their energy into already successful business organizations. In these times of dramatic transformation, strategy becomes more and more the focus of energy and interest for entrepreneurial leadership, shadowing a sense of uncertainty over the decisions making process (Drucker, 1999). Generally, a successful mindset is grounded in a vision and the role of training and education comes to inspire and influence the society. Top performers envision their dreams translated into actual successful results and achievable goals being committed to hard work until dreams become reality. The majority of the high achievers consider that the opportunity of success is more important than the possibility of failure and the current global turmoil poses many opportunities for some. Comfortably accepting taking chances, having a higher risk tolerance compared to the majority of people and in case of project failure, they are very likely to learn quickly from the experience and try again (Kiam, 1986). Another important determinant is confidence. Successful individuals, managers and entrepreneurs have a high degree of confidence, they believe in their own abilities, which help them overcome failure, knowing that they will succeed the next time. A good level of confidence comes from having sustainable principles, knowing own abilities and limitations – a key characteristic in tough times or setbacks. The level of confidence derives from the awareness of the self-possessed aptitudes and capabilities, inborn talents and abilities which become efficient tools in planning and managing the business ventures and various circumstances (Grove, 1983). In these transforming times, many learning enterprises emerged aiming to attract and re-skill people who possess the intrinsic motivation and "have the ability of seeing opportunities, identifying gaps between needs and wants, are ideas generators, very perceptive of the surrounding world, with a good understanding of people's intentions and emotions (Boyle, 2004).

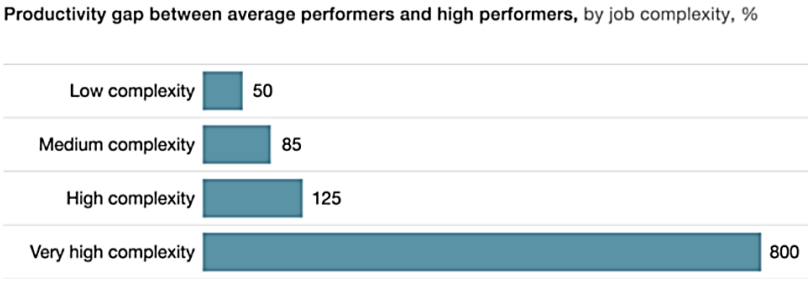

Figure 2. The relationship between talent and business performance

Source: McKinsey Global Survey https://www.slideshare.net/BizLib/3-key-elements-to-keeping-high-performers-engaged

McKinsey Global highlighted the relationship between talent and performance and differentiating complexity aspects between average and high performers. Learning programmes designed to enhance logic and reasoning skills in order to solve consumer and business problems continue to attract those who are "perseverant and determined to succeed overwriting the long working hours, disappointments, and setbacks" (Love, 1986). Crisis management, risk management, business development training, procurement & supply chain, blockchain management, machine learning, financial, leadership development, executive courses, business bootcamps, all offer the knowledge sharing of the brightest academics and industry experts. The majority of the academic institutions have employed and perfected their online research programmes striving to contribute and become an active part of the solution to the problems we face today and build along with the student's determination, vision and enthusiasm. Their passion, along with good communication skills, planning and decision-making becomes essential when they have to deal with various circumstances and problems, finding the most appropriate resolution (Blanchard, 1999). Decision-making in times of crisis is another essential skill and sometimes, the difference between success and failure can be the individuals' ability or inability to plan and prepare for the future. Thinking ahead about the changes a company needs to make to continue growing implies fewer surprises in the long run, as sometimes unexpected growth can leave entrepreneurs scrambling for immediate solutions for lack of equipment, staff, and time. (Branson, 2013) highlights that failure could very well be one of the secrets to success, as one can innovate and grow only by trying something new and if failing occurs, the learning process ensures the continuity in an improved form. However, dealing with failure is not an easy undertaking; it is common to every human being, regardless of the efforts that are being put in, in order to avoid it. Everybody faces challenges and unpleasant events in life, but resilience and how to overcome failure is the essential trait that builds a growth mindset. Successful individuals are those who have the capacity to quickly adjust to changes and overcome challenges on their journey of failing forward and reconcile emotionally to a fresh start. The ability to quickly reroute derives from the attitude, the overall outlook, the ability of mastering a personal psychological support, as well as adopting a continuous life learning approach. Entrepreneurs and leaders in general, experience many setbacks and their success is dependent on their ability to overcome failures and quickly bounce back, being persistent and resilient to different challenges and circumstances (Hanson, 2018). Learning & development organizations have tailored their programmes as to instil such intangible skills while teaching the ability of applying elaborate problem-solving techniques, communicating effectively and being empathetic listeners, essential to developing an innovative business culture.

3. Adopting a Growth Mindset to Improve Performance and Ensure Business Sustainability

The world's business environment, major industries and national economies have been shattered by the recent global crisis triggered by the Covid-19 pandemic that changed the core and the norms of living and working conditions around the globe. Nevertheless, people with a mentality of always learning are able to see opportunities where others see problems, and therefore adapt in a successful way to the occurring changes and transformations of the world around. Authenticity and enthusiasm often translate into creating new ideas, designing products, strategies and business models leaving behind the traditional way of doing things. Creativity and innovation will pave the way towards a sustainable business context. The combination of the creative thinking with today's technological developments will translate in major future disruptions and great discoveries in science, information technology, economics, biotechnology and other associated fields, improving the global welfare and the overall quality of life itself. Today, more than ever, the world needs leaders able to propose new ways of doing things and ensure the sustainability and preservation of the population and global resources. Extreme importance is attributed to the training component and the educational dimension which focuses on acquiring the necessary skills and techniques that are applicable in the real world (Handy 1994). People appreciate people who are good listeners and represent their interests well. Research showed that individuals who are exposed to leadership while working, regularly participate in workshops and seminars learning management skills, strategies and theories specific to leadership, etc., can better identify the diversity and the difficulty of problem-solving, distinguishing between advantages and limitations. The latest significant growth of modular credential based online programmes offers the opportunity of sharpening ones' skills as a future entrepreneur, planner, public speaker, debater, negotiator, etc. - skills that are of maximum importance in a leader's professional portfolio in addition to reading, participating to lectures and conferences. Literature review showed a mix of factors contributing to the reasons and motives why some people wish to influence change and seek positions of power (DeHeaven, 2008). For some, the desire to be in the middle of the action is sufficient to mobilize their efforts, while others seek to make an impact in the community. Living their lives with good meaning and purpose might be sufficient to take on a daunting task, while other may adhere to a certain ideology (Kiyosaki, 1998). People are fuelled by various intrinsic motivations, from ideals of overcoming own limitations to exhilaration of solving problems or a desire to feel relevant generated by the psychological need to prove one's worth or "it might be the honour of holding highly regarded positions and make an impact in the world" (Deci, Ryan, 1985). Whatever the motivation, the general tendency is to filter the experiences by the impact caused by someone who encouraged and inspired us with the power of their personal example.

4. Findings: The Importance of Learning in Contemporary Business Landscape

Education continues to play an essential role in the development of young talents as it provides them with the building blocks they need for the future. However, the recent times highlighted a need of upskilling and reskilling of talents with the help of the digital transformation and automation who is estimated to have an unprecedented impact in the world. As a result to the Covid-19 pandemic, 74% of the surveyed executives of a Gartner report will permanently keep online part of the remotely placed workforce. The existing workforce is increasingly reskilled by learning organizations whose flexible study programmes are focused on driving learner engagement to meet today's business needs and anticipate the future demand and transformation of work. A McKinsey Global 2019 Survey on distribution of organizational investment reflects the priority of business enterprises highlighting that training and development receives considerable investment funds: close to 25% training and developing compared to the 15% allocated to recruiting and compensation changes. Thinking analytically and creatively and knowing how to manage a business is a great advantage, and a great number of universities are actively teaching subjects specific to entrepreneurial leadership as to instil the set of attitudes, skills and behaviours that students need in order to develop a growth mindset to succeed academically, personally and professionally (O'Rourke, et. al. 2014).

A 2018 LinkedIn Learning report highlighted that 81% of the executives interviewed regarded human talent as a top priority, while 90% considered learning and development to be a necessary benefit to the company's employees. According to 2020 LinkedIn Learning survey, managers spend on average 30% more time learning soft skills than the average learner. There is a broad array of online learning facilities and MOOC programs a form of accessible massive online open courses specifically designed to target all segments of students, from young learners to reskilling professionals to aspiring managers, entrepreneurs and executive leaders. It is clear that the education becomes a competitive advantage and a real investment - one which effective organizations appreciate as being an advantage for the individual, especially when practical experience may be lacking. As the world is confronted with what was proved to be a severe global crisis, the society had been forced to rapidly change and coupled with the career span which is shorter on average, as a consequence the need for intelligent people in organizations is increasingly growing. On the same note, organizations need to foster the opportunity for young talents to grow while they work and develop critical thinking abilities, practical and analytical intelligence (Goleman, McKee, Boyatzis, 2002). According to the LinkedIn Learning workforce report conducted in 2018 where 200 executives, 400 managers, 1,200 talent development professionals and 2,200 employees were interviewed, approximately 94% of the employees declared that they would work longer in a company if invested in their career development. The same survey reflects the importance levels of certain skills developed under the training programmes and rated by the talent developers:

74% leadership skills, communication 66%, collaboration 50% and 50% role specific skills. The technological advancements of past years facilitated the introduction and development of the distance learning and online mentoring programmes, which had a tremendous impact on traditional higher education, reframing the fundamental academic structure of the educational institutions. Technological advancements, coupled with the imposed restrictions caused by the pandemic, forced the relocation of business activities strictly online. In some circumstances it had proved to be a perfect short-term sustainable strategy and the ideal long-term trajectory of the organization's future.

5. Conclusions and Recommendations

For the past years, the overall global trend was to embrace training and education as being the gateway towards a society better adapted to transformational changes, to the point where the well-developed countries have increasingly been supporting specialized training and funding programmes. As the global pandemic brought all industries to a halt, indirectly forcing organizations to remote their activities online, it becomes apparent that this trend will continue to increase. The importance of training and development will become globally recognized. According to 2020 LinkedIn Learning survey, more than 75% of each generation of learners prefer taking personalized course recommendations based on their career goals and skill deficiency: 77% of boomers, 78% of generation X, 79% of millennials and 80% of generation Z. Many people are motivated to learn, or start-up own businesses, continually developing themselves by keeping updated with the market trends, competitors' strategies, initiating creative and innovative ideas, thus ensuring the sustainability component of the business. As new ideologies emerge favoured by the world's interconnectedness and made possible by the technology development, various possibilities are created for those with a growth mentality and a desire to improve themselves. In these challenging times, all aspects ought to be considered: planful opportunism, trends forecasting, global economics, management practice, marketing strategies, business process reengineering, information technology, organizational learning and ultimately, the art of leadership (Tichy, Cohen, 2002). Past business developments and two decades of theories and research bring us to the challenging present times, opening the way to the future possibilities, business innovation of new concepts and business models, in this continuous transformational landscape of uncertainty. By assessing the wide spectrum of the global system complexity in the context of the current conditions, the conclusion to be drawn is that the current crisis management followed by decision making requires objective assessment, creativity of ideas, service and portfolio management as to restart, revive and reposition the performance in sound and sustainable business strategies. Organizations ought to embrace a growth mindset, creating a culture in which employees feel encouraged and motivated to contribute to the company's vision and assist communities with innovative products and services to better adapt, communicate, collaborate and enjoy

livelihood in a healthy and safe environment. While companies play a major role in hiring and attaining young talent through internships, international exchange programmes, etc., so do the academic institutions, L&D organizations play a crucial role in broadening the students' perspective, fuelling their passion and drive to continually develop themselves. As the world of work continues to undergo dramatic transformations, aspiring young talents who are at the moment acquiring their baggage of knowledge and preparing for a career need to be aware of the growing demands of the employment markets and what are the necessary skills that increases their chances for a more successful targeted recruitment. Training programmes that allow them to apply the discipline and strategic thinking patterns, learning about real case studies and making connections between the scientific findings and the reality display may well inspire their following actions and way of life, improving their ability to draw own logic reasoning and conclusions. As the world of research is being reshuffled, mainly influenced by the dramatic impact of this unprecedented crisis, besides the teaching of the scientific discoveries, theoretical principles and concepts, the goals of the educational system and learning organizations should concentrate more on increasing the practical component of training. It is of paramount importance that alumni involvement in workshop activities be increased, aiming towards efficiently shaping the workforce, the future managers, entrepreneurs and business leaders for a well-balanced and self-sustaining society. An efficient educational system fosters a culture of learning in an encouraging environment meant to inspire the individual's potential to acquire and develop a strong and healthy belief system. Determination, dedication and sustained effort expands performance records in school, career and life, enabling people to feel motivated and concentrate all their resources and abilities into achieving the highest goals.

References

[1] Blanchard, K. (1999). *The heart of a leader*, Cook C. David consulting partners of Ken Blanchard Companies.

[2] Boyle, M. (2004). *Why Fed-Ex is flying high*, Fortune, November 1st.

[3] Branson, R. (2013). *Failure and success, The history of a billionaire*, Independent Publishing Platform.

[4] Deci, E. L., Ryan R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behaviour*, New York.

[5] DeHeaven, B. (2008). *The currency of the future: when you know this, you control your destiny*, USA.

[6] Drucker, P. (1999). *Management challenges in the 21st century*, HarperCollins, New York.

[7] Gartner (2020). Retrieved from: https://www.gartner.com/en/newsroom/press-releases/2020-04-03-gartner-cfo-surey-reveals-74-percent-of-organizations-to-shift-some-employees-to-remote-work-permanently.

[8] Grove, A. S. (1983). *High output management*, New York, Random House Inc.

[9] Goleman, D., Mckee, A., Boyatzis, R. (2002). *Emotional intelligence in leadership*, Goleman Daniel.

[10] Gunther McGrath, R., MacMillan, I. (2000). *The Entrepreneurial Mindset – Strategies for continuously creating opportunity in an age of uncertainty*, Harvard Business School Press, Boston, Massachusetts.

[11] Handy, C. (1989). *The age of unreason,* Harward Business School Press, Boston M. A.

[12] Handy, C. (1994). *The age of paradox,* Harward Business School Press, Boston M. A.

[13] Hanson, R., Hanson, F. (2018). *Resilient: How to Grow an Unshakable Core of Calm, Strength, and Happiness,* Potter/Ten Speed/Harmony/Rodale, Mar 27.

[14] Kiam, V. (1986). *Going for it! How to succeed as an entrepreneur*. New York, William Morrow and Company.

[15] Kiyosaki, T. R., Letcher, L. S. (1998). *Rich dad, poor dad – what the rich teach their kids about money that the poor and middle class do not!* Tech Press, Inc.

[16] LinkedIn Learning, retrieved from https://learning.linkedin.com/content/dam/me/learning/en-us/pdfs/linkedin-learning-workplace-learning-report-2018.pdf.

[17] LinkedIn Learning, retrieved from: https://learning.linkedin.com/learning/resources/pdfs/LinkedIn-Learning-2020-Workplace-Learning-Report.pdf.

[18] Love, J. F. (1986). McDonalds: *Behind the arches,* New York, Bantam Books.

[19] McKinsey Global Survey, retrieved from: https://www.slideshare.net/BizLib/3-key-elements-to-keeping- high-performers-engaged.

[20] O'Rourke, E., Haimovitz, K., Ballweber, C., Dweck, C., Popović, Z. (2014). *Brain points: A growth mindset incentive structure boosts persistence in an educational game;* New York.

[21] Tichy, M. N., Cohen, E. (2002). *The leadership engine: How winning companies build leaders at every level*, Harper Business, New York.

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Collaborative Complexity on Bioeconomy Path

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Abstract

In the last decade, the term bioeconomy has gained importance in research debates. The place of the Amfiteatru Economic journal among the Web of Science publications addressing the field of bioeconomics is promising. The Bucharest University of Economic Studies is among the universities with representation in the field of bioeconomy. To promote a competitive and sustainable bioeconomy, there is a need for a participatory engagement between the public and stakeholders in open and informed dialogue, as well as governments and industries receptive to innovation. It was also found that the main theme of the red cluster from the bibliometric analysis undertaken in the field of bioeconomy is "innovation". For this, a 38-year cycle was studied which showed 1,054 articles identified that used the term bioeconomy. Bioeconomics is part of our daily lives, so publications display the multitude of terms and multidisciplinary life-supportive connections. Biological resources and innovative technologies are already being used to replace unsustainable products and processes, which are currently obtained from fossil resources. Some biobased goods may even have new properties, which make them superior to current known and used products. The results of the research can be useful for the regulations on climate change and environmental sustainability along with economic and social development; it is unanimously accepted that an activity, even commercial, contributes to the social support of the population and its health. Research and innovation promise solutions to the challenges of business and society. To reduce the gap between current potential and the moment when concrete applications begin to generate societal impact, critical efforts will be essential to make progress visible.

Keywords: bioeconomy, research, bibliometric analysis, collaboration.

JEL Classification: A30-39, N500, O300, Q000

1. Introduction

To prevent the harmful accumulations of life and to mitigate the existing ones, humanity needs ideas, concepts and legalities for the efficiency and clarification of

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the planetary environment. Thus, the terms that coagulate, globally, the social, economic and environmental are "innovation", "science", "biorafinery" and "forest" and represent the result of the bibliometric study on bioeconomy which includes works of scientific research published between 1975 and February 2019.

Extensive studies have shown that only the bioeconomy has the duty to highlight laws that reconstitute the biological primacy over typical human voluntarism. It is worth to note the contribution of the Romanian researcher Georgescu-Roegen who conceived and used the term bioeconomy to refer to a radical ecological perspective on the economy which he developed in the 1970s and 1980s.

In response to many questions, the research undertaken by Șerban M. (2013) culminated with the fundamental law of bioeconomy. According to the author, bioeconomy expresses the assurance of an optimal quantity of the living environment of humanity. Based on such considerations and through long observations, Vivien F-D. et al. (2019) found that bioeconomy has become a key word used by public institutions to announce and describe an alleged current economic and ecological transition.

Therefore, it is necessary that through appropriate mechanisms the natural basis of the planet and the climate system be preserved. Noteworthy is the European Commission's effort to stimulate Europe's transition to a circular economy, fuelled by global competitiveness, raising awareness, and promoting the concept of sustainability and last but not least, generating new jobs.

The reference to the innovative economy – "a bioeconomy for Europe" - is suggested by the European Commission, following the projections regarding the alarming growth of the population at global level. Specifically, the essential aspects refer to: development of technologies and processes for bioeconomy; developing markets and competitiveness in bioeconomy sectors; closer collaboration between decision makers and stakeholders. As a result, through the natural supports, economy is "timing" the race between the critical points of nature and politics while European Union, promoting the initiatives in bioeconomy, creates financial opportunities, respectively European structural investment funds.

2. Problem Statement

The European Commission laid the foundation for the new EU strategy on climate change through the European Green Agreement. In this context, the bioeconomy can respond to the challenge by managing sustainably resources and processing waste for commercial purpose.

Bioeconomy, as a field of current scientific research, achieves values of intelligence (knowledge and innovation development), sustainability (based on a greener, competitive economy and efficient in resource management) and also proves favourable to inclusion (aims to strengthen employment, social and territorial cohesion).

Bioeconomy is defined as the economy that produces and processes biological resources from terrestrial and aquatic ecosystems / agroecosystems. As a result, it

includes agriculture, forestry, fishing, aquaculture, food industry, cellulose and paper industry, but also important part of chemical, biotechnological and energy industries, an in-depth situation of the EC bioeconomy.

The bioeconomy and natural economies have common elements with the economies based on fossil fuel consumption. Like the natural economy, the bioeconomy is based on renewable (bio) resources. From another point of view, production is more intense as in the fossil fuel economy, but inputs are sustainably produced and are effectively rebuilt, reused, or recycled (Potting et al. 2017).

From a physical point of view, the bioeconomy can be measured by biomass flows, determined by fundamental economic concepts (demand and supply).

Demand is driven by society's need for food, feed, bioenergy and biomaterials (natural fibres, biochemicals and pharmaceuticals) (Kitchen and Marsden 2011).

Lewandowski (2015) considers that the supply of biomass is made from agricultural and non-agricultural land, respectively: (a) pastures provide pasture for animals; (b) agricultural land supplies cereals and crop residues; (c) forests, plantations and many small farms provide woody biomass for energy and for use as a building material; (d) lakes and rivers provide aquatic biomass.

The analysis of the existing scientific literature on bioeconomy takes a global approach and includes all fields of research (there is a significant overlap in research conducted on bioeconomy between the fields of human, social, natural and technical research; for example, the ethical aspects of bioeconomy development are often covered by journals classified as humanists, so the research field is included). Figure 1 shows the research areas in tangency with bioeconomy with a participation of at least 4% of the total works displayed by Web of Science. The works are presented mostly in English (Figure 2).

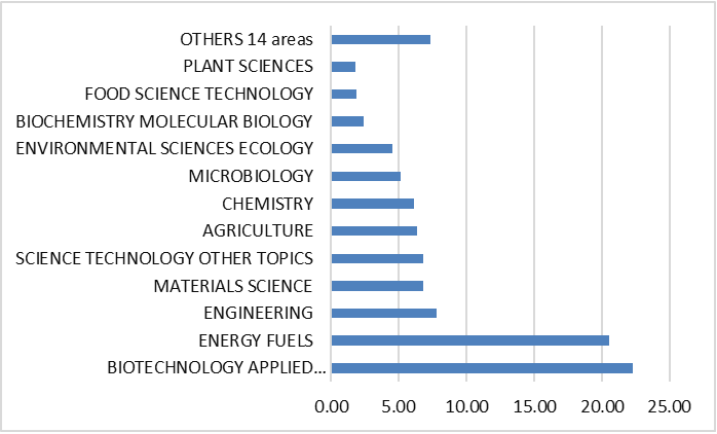

Figure 1. Research areas with bioeconomy application

Source: Personal quantitative processing of data downloaded from the Web of Science

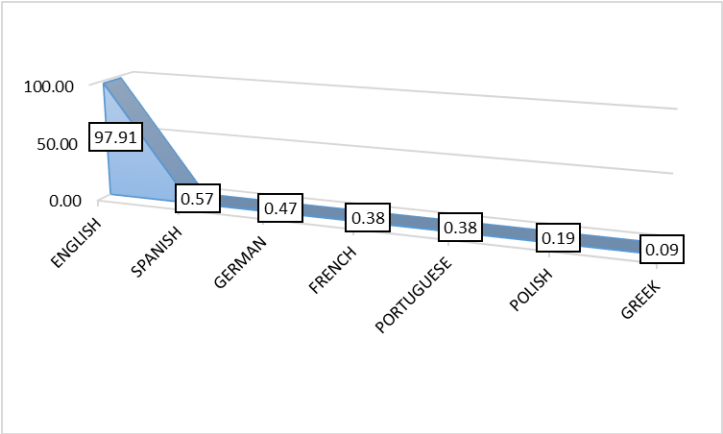

Figure 2. Linguistic representation of works (%)
Source: Personal quantitative processing of data downloaded from the Web of Science

This research is associated with didactic activities of universities. For this reason, it is important to know the representativeness considering publishing of universities in the bioeconomic field (Figure 3). It is found that the Bucharest University of Economic Studies ranges in the first half of all universities.

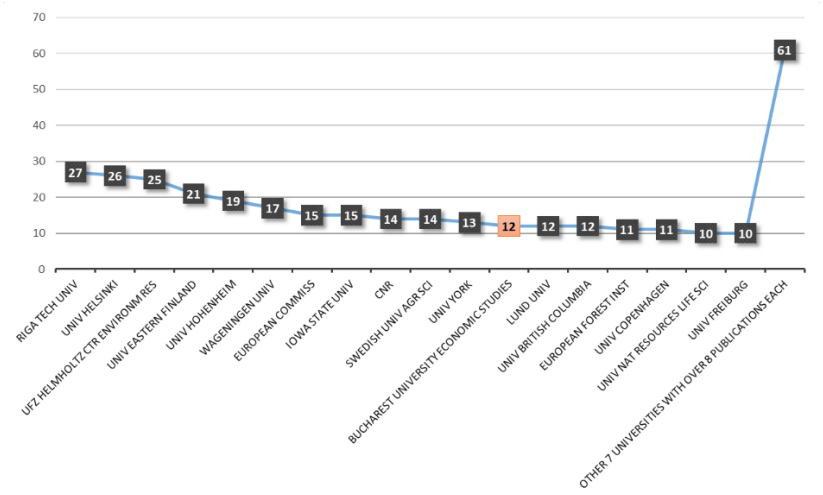

Figure 3. University representativeness for research in bioeconomy (number)
Source: Personal quantitative processing of data downloaded from the Web of Science

Universities operate in cities scattered throughout the world. Figure 4 shows in number and structure the scientific records from different countries. Romania is in the first half of the list of countries with advertising registrations (3%), but their number is below the average of country registrations.

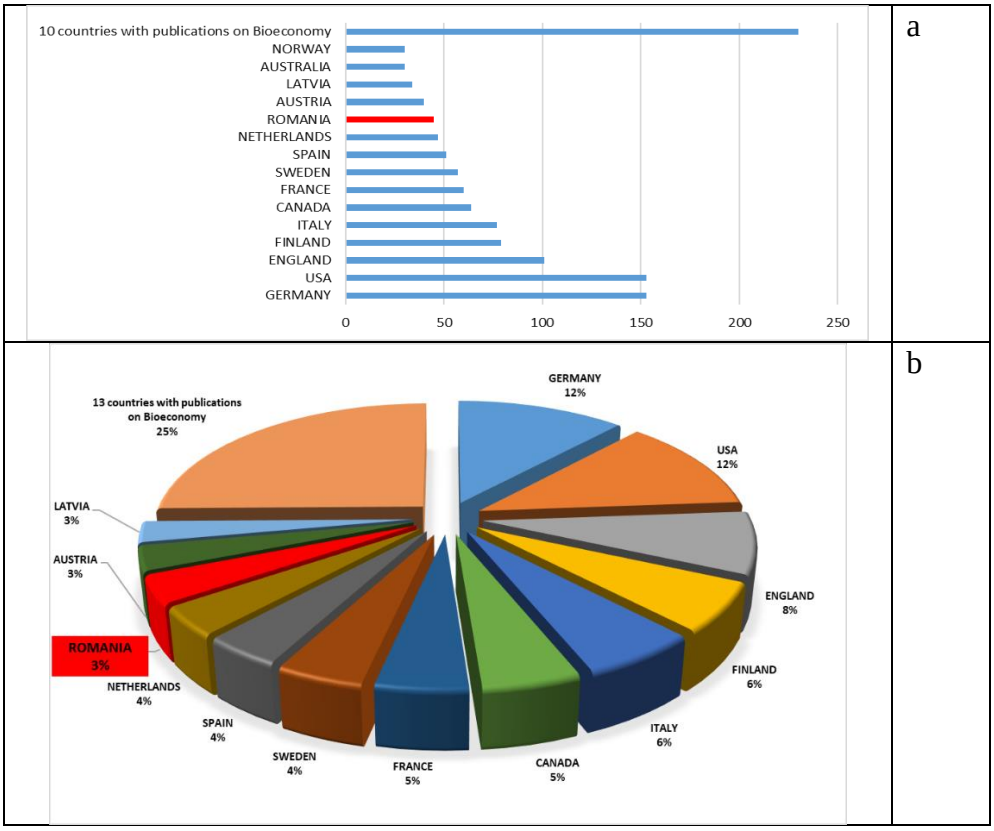

Figure 4. Countries affiliated to scientific publications in the field: a – number of records; b – structure of records

Source: Personal quantitative processing of data downloaded from the Web of Science

The results of the scientific endeavour are published in internationally recognized journals - ISI: Journal of Cleaner Production, Sustainability, Biofuels Bioproducts, Biorefining Biofpr, New Biotechnology, Amfiteatru Economic, Energy of Proceedings, Chemical Society, Bioresource Technology, Biotechnology for Biofuels, New Genetics and Society, Economic Complexity and Evolution, International Sugar Journal, Knowledge Driven Developments in the Bioeconomy Technological and Economic Perspective, Technology and Technology, Forests, Journal of Biotechnology, Current Opinion in Environmental Sustainability, Trends in Biotechnology, Applied Microbiology and Biotechnology, Biosocieties, Forestry Chronicle, International Scientific Conference Environmental. These include Amfiteatru Economic journal, with a 5% share in the bioeconomic theme (Figure 5). The journal is the product of the Romanian teachers, researchers and scientists mainly from the Bucharest University of Economic Studies.

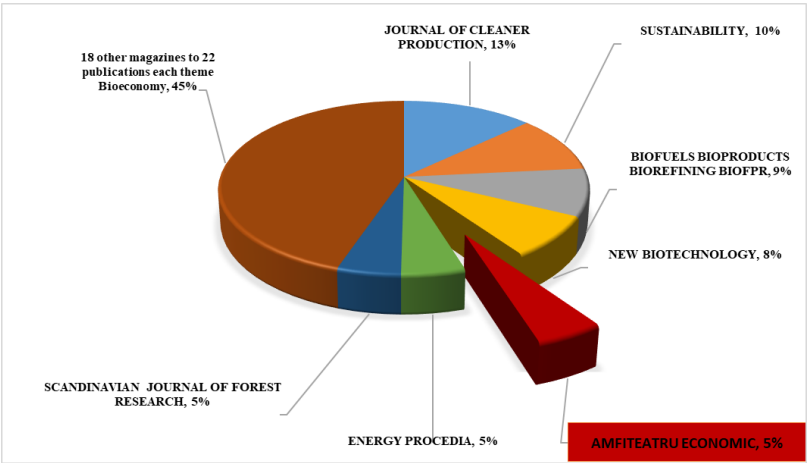

Figure 5. Publications that show scientific articles on bioeconomy theme
Source: Personal quantitative processing of data downloaded from the Web of Science

3. Research Questions / Aims of the Research

Sustainability is currently the most important issue in human existence. The constant growth of human population and the consumption per capita have contributed to the diversification of anthropogenic activities, involving natural resources that are close to depletion and accelerating the accumulation of waste. At the same time, urbanization, industrialization and modern agricultural practices have polluted the water, air and soil resources, making it difficult for future generations to survive. To stop these consequences, multidisciplinary bioeconomic research (methodological harmonization and coherence in the value chains of the bioeconomy) proposes sustainable solutions for policy development.

The quantitative approach of research through specialized literature in the field highlights the importance of the current bioeconomic models, as well as the socio-economic interconnection relations with the environment in the perspective of sustainability.

4. Research Methods

Bibliometric approach of bioeconomy foundation. Bibliometric analysis is based on the literary retrieval of the relevant scientific articles indexed in a recognized scientific database (Web of Science). The delimitation of a sample can be defined by the period of publication chosen, the geographical location of the authors, the selection of research areas, the selection of a journal sample or the selection of keywords (Diaconeasa et al., 2019; Zaharia et al., 2019). For the purpose of this study, the indexed literature analysed is that between the beginning of 1975 and the beginning of 2019 (February).

Web of Science displays 1,054 articles identifying the term bioeconomics (21,341 terms used, of which 641 appear in keywords and have a frequency of at least 10 times in the text; with 60% relevance are 385 terms out of 641).

The terms are grouped according to their correlations (Figure 6; VOSviewer Software Package).

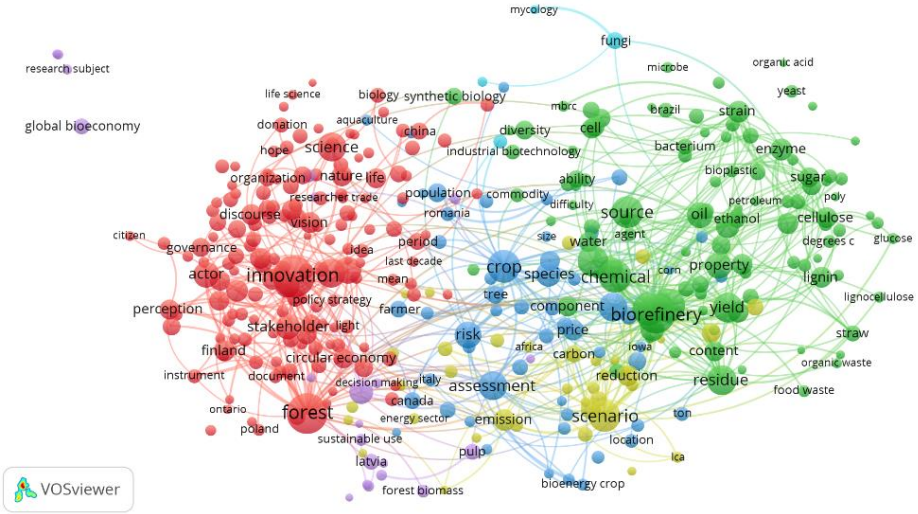

Figure 6. Map of the network for terms used in explaining the concept of bioeconomy

Source: Personal quantitative data processing downloaded from the Web of Science

Thus, groups / clusters of different colours were formed, with the main theme of the cluster in the centre.

For example, the red cluster formed around the word "innovation" (innovation), the key pillar of the bioeconomy; its main connections are with the following terms: circular economy, science, nature, forest, perception, stakeholder, governance, organization, actor, vision, but also references to concepts from other clusters.

Many key words can be found in worldwide scientific publications. Based on it, the bibliometric study was performed starting with 1975 and it represents the proof for interdisciplinarity in bioeconomics investigation.

5. Findings

An attempt was made to explore the academic literature that contributed to enhancing and deepening the understanding of the concept of bioeconomy, respectively exploring the origin and taking over the content of the term. As a result, the bibliometric analysis undertaken highlights the fragmentation of the research community in the field of bioeconomy and its distribution in different fields of science, even though natural sciences and engineering have a central role.

The literature review identifies the paths of bioeconomy. It refers to the links of bioeconomy with biotechnology (it stresses the importance of biotechnological research and the application and commercialization of biotechnology in different sectors of the economy), natural resources (it focuses on processing and modernizing biological raw materials, as well as creating new value chains) and ecology (it highlights the sustainability and ecological processes that optimize the use of energy and nutrients, while promoting biodiversity and avoiding monoculture and soil degradation). Bioeconomy includes production systems that involve biophysical and biochemical processes. Including all life sciences and related technologies that result in useful products, the collaborative aspect of the research, but not only, is shown. At the same time, the effects of climate change and the depletion of fossil resources have increased the pace of interdisciplinary research in the field of bioeconomy; noting the need to use bioresources responsibly by reducing / reusing / recycling / recovering, the bioeconomy finds its usefulness.

The quantitative approach of the research through the scholarly literature in the field highlights the importance of the current bioeconomic models, as well as the socio-economic interconnection relations with the environment in the perspective of sustainability. Using the Microsoft Office Excel program and VOSviewer software, an analysis of the content of the scientific publications from Web of Science platform including the term bioeconomy was made by quantitative and qualitative approach, respectively the main issues discussed in the titles and abstracts.

The terminology and definitions for bioeconomy accessed in the bibliometric analysis come in particular from the European Commission, the OECD (Organization for Economic Co-operation and Development), the United States of America, as well as the International Energy Agency for Bioenergy (IEA Bioenergy) and the European Association for Bioindustry (EuropaBio).

References

[1] Bran, Ș. D. (2019). Bioeconomia și perspective, *Teză de doctorat*, ASE București, pp. 17-41.

[2] Diaconeasa, M. C., Popescu, G., Boboc, D. (2019). Sustainable food consumption in the Web of Science Abstracts, *Economic Computation and Economic Cybernetics Studies and Research*, 53(1).

[3] European Commission (EC) (2012). *Innovating for Sustainable Growth: A Bioeconomy for Europe*, Brussels, Belgium.

[4] Organisation for Economic Co-operation and Development (OECD) (2009). *The Bioeconomy to 2030: Designing a Policy Agenda*, Paris, France, p. 326.

[5] White House (2012). *National Bioeconomy Blueprint*, Washington, DC, USA, p. 48.

[6] European Association for Bioindustries (EuropaBio) (2011). *Building a Bio-based Economy for Europe in 2020*, Brussels, Belgium.

[7] Georgescu Roegen, N. (1971). The Entropic Law and the Economic Process, *HUP eBooks*.

[8] Georgescu-Roegen, N. (1969). Process in farming versus process in manufacturing: a problem of balanced development. *Ugo Papi et Ch. Nunn, eds., Economic Problems of Agriculture in Industrial Societies*, London, Macmillan, New York, St. Martin's Press, pp. 497-528.

[9] Georgescu-Roegen, N. (1976). Process in farming versus process in manufacturing: a problem of balanced development. *Energy and Economic Myths*, New York, Pergamon, chap. 5.

[10] Georgescu-Roegen, N. (1979). *Legea entropiei şi procesul economic*. Publishing House Politică, Bucureşti.

[11] Kitchen, L., and Marsden, T. (2011). *Constructing sustainable communities: a theoretical exploration of the bio-economy and eco-economy paradigms.* Local Environment, 16(8), pp. 753-769, https:// doi.org/10.1080/13549839.2011.579090.

[12] Lewandowski, I. (2015). *Securing a sustainable biomass supply in a growing bioeconomy*. Global Food Security 6 (October), pp. 34-42, https://doi.org/10.1016/ j.gfs.2015.10.001.

[13] Potting, J., Hekkert, M. P., Worrell, E., and Hanemaaijer, A. (2017). Circular Economy: Measuring Innovation in the Product Chain. Utrecht: PBL Netherlands Environmental Assessment Agency, https:// dspace.library.uu.nl/handle/1874/358310.

[14] Şerban, M. (2013). *Bioeconomia – noua unire cu natura*, Publishing House Universitară, Bucureşti, pp. 113-114.

[15] Vivien, F.-D., Nieddu, M., Befort, N., Debref, R., Giampietro, M. (2019). The Hijacking of the Bioeconomy. *Ecological Economics*, Volume 159, pp. 189-197.

[16] Zaharia, A., Diaconeasa, M. C., Brad, L., Lădaru, G.-R., Ioanăş, C. (2019). Factors Influencing Energy Consumption in the Context of Sustainable Development. *Sustainability*, 11, p. 4147.

[17] www. EC. European bioeconomy.

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Assessment of a Decade of Greenhouse Gas Emissions

Iulian GOLE[1], Victor-Marian DUMITRACHE[2], Florentina Olivia BĂLU[3]

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Abstract

In this article, we aim to analyse the causes of the greenhouse gas emissions gap and their evolution, comparing the expected results established at the 2010 Hague Conference with what actually happened in the last 10 years. The paper will try to explain that even though some important steps were taken, the planet is not yet on a good path if we don't improve our industrial activity. The solutions already exists, few countries implemented them and we could see real results in different sectors of activity (mainly power generation), but obviously not simple to replicate everywhere. The public policies and the environment agencies in charge of implementing them must assume this responsibility and find appropriate methods so that the objectives assumed at COP 21 Paris can be achieved by 2030.

Keywords: GHG emission, COP21 target, CO_2 reduction potential, power generation, environment public policy.

JEL Classification: A 12, H 73, Q2, Q4, R11

1. Introduction

Despite a decade in which most of politicians and society leaders have focused on climate change and settling the goals of the Paris Agreement, the value of global greenhouse gas (GHG) emissions has not diminished at all; actually, the difference in emissions is bigger than ever. It is obvious that if there are no immediate and ambitious measures from all decision makers that will materialize in long-term strategies, accepted by all important factors, the objective of having a temperature increase of only 1.5°C compared to the preindustrial period can no longer be reached and even achieving the temperature target well below 2°C is becoming increasingly difficult. Of course, some unexpected events, like Corona virus, can immediately and drastically reduce the global commercial activity with a direct

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positive impact on reducing CO_2 fingerprint. No doubt, in the most affected areas, there will many people working remotely from home which means at least car traffic diminishing. This situation cannot be predicted, but it proves that the world can continue its activity without excessive consumption.

Before looking at the global trend in greenhouse gases (GHG) over the last 10 years, for a better understanding, we present a small summary of the objectives adopted by the Paris Agreement in 2015 - COP 21.

Thus, for many years, countries that have met under the United Nations Framework Convention on Climate Change (UNFCCC) have considered 2°C as the level of warming over which climate change would be extremely dangerous. In this context, concerns have been raised about the impact of climate change – some of them are already apparent and other expected at 2°C, including the effect of sea level rise in island countries below sea level.

Due to human activity, the concentration of atmospheric carbon dioxide (CO_2) has increased by more than 40% compared to preindustrial times. In addition of this, we faced the increase of level in other greenhouse gases, such as nitrogen oxide, and this situation has led to an average increase in global temperature of 1°C above preindustrial levels, with much higher heating in some regions, especially in Arctic area. Currently, global temperatures rise to around 0.2°C every ten years. This rise in temperature already has a visible impact, which is the rising of sea level and without any doubt this will continue in coming years. Global heating has brought its contribution to more frequent and intense extreme weather events, such as heat waves in Europe, unprecedented bush fires in Australia, heavy rainfall in dry area and even snowfall in Iraq. It is easy to predict that if this trend will continue, the impacts will become more and more severe, as long as general temperature increases.

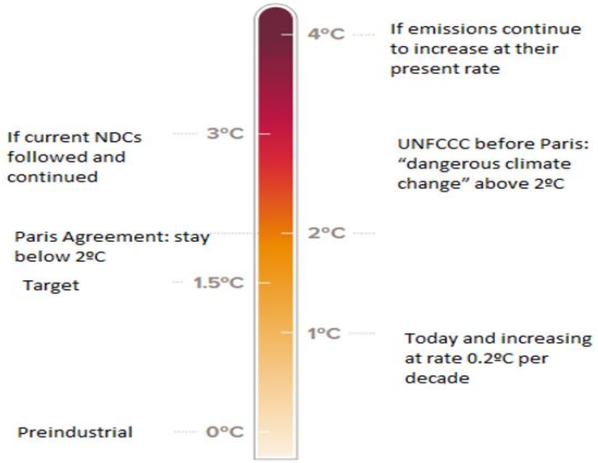

Figure 1. Level of expected global warming

Source: https://royalsociety.org/-/media/policy/Publications/2018/keeping-global-warming-to-1-5-C--challenges-opportunities.pdf

Under the actual circumstances (business carried out as usual), the pledge to reduce emission, voluntarily agreed by almost all countries under the Paris Agreement − named *nationally determined contributions* – NDC, with a high probability, we will have a global warming of around 3°C by 2100. But this is only if we observe the understanding we reach up until now. On the other hand, if GHG emissions continue to increase at their present rate (which means that not all countries observe their resolutions), temperatures could go above 4°C by the end of the century.

Aiming the 1.5°C objective may still be real but the politicians, lobbying societies, industry leaders and international corporations, public society have to go on the same direction in order to succeed. It is very important that the next period to have and follow a real project management, with a clear plan observed by all countries and international organisations, by each business sector and by all concerned players. As we will see in the next parts, there is a big difference between what was pledged by all countries and the reality.

Let's see what was achieved during the last decade, despite the official agreement conclusion and the happy faces after each COP or other international environment meeting.

There are still some countries who are registering a certain progress in terms of GHG emissions (mainly grouped under the EU) but they cannot offset the general situation. Overall, the global level of GHG emissions continues to grow in a steady pace. According to UNEP, between 2008 and 2017, the GHG global emissions grew with a rate of 1.6% yearly, reaching 53.5 Gt of CO_2 in 2017. According to preliminary data, 2018 will set a new record. If we look closer to the data, we can see that EU is the single entity which succeeds in diminishing voluntarily its emissions while Russia, Japan and USA are maintaining the same level. China and India are by far the most harmful in the general picture.

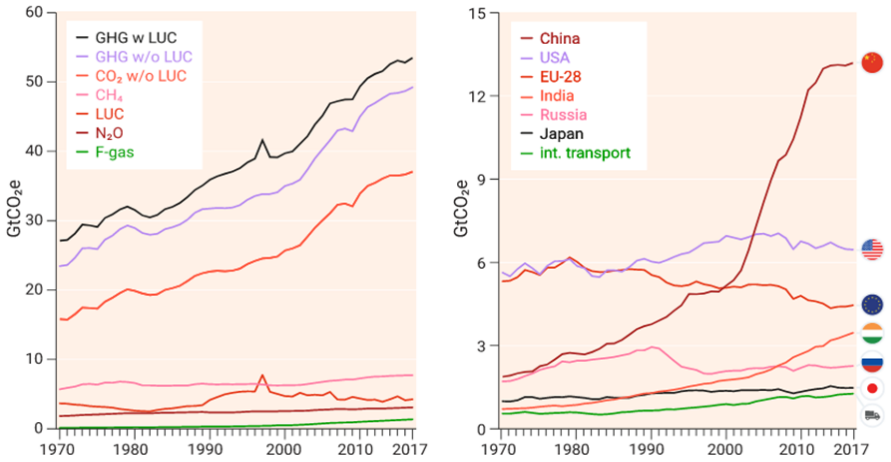

Figure 2. Global greenhouse gas emissions per type of gas and top greenhouse gas emitters

Source: UNEP (2018)

Unfortunately, the current level of GHG is at exactly the same level as forecasted for 2020 as if there were no policy or global willing to emissions gas reduction which means that there was no real change in the global emissions over the last decade. Despite some improvements, it was insufficient to offset the global economic growth (as we can see from data published by international experts (I.M.F., 2019) in the graphic below, the global GDP moved from 66.07 thousand billion USD in 2010 to 86.6 in 2019[i]) and population growth (according to United Nation data – published in the Revision of World Population Prospects, 2019 – from 6.9 billion to 7.7 in 2019; the same data could be also found in other sources[ii]). Unfortunately, it is proved once again that GHG emissions are strongly linked to economic activities and also with the growing number in population.

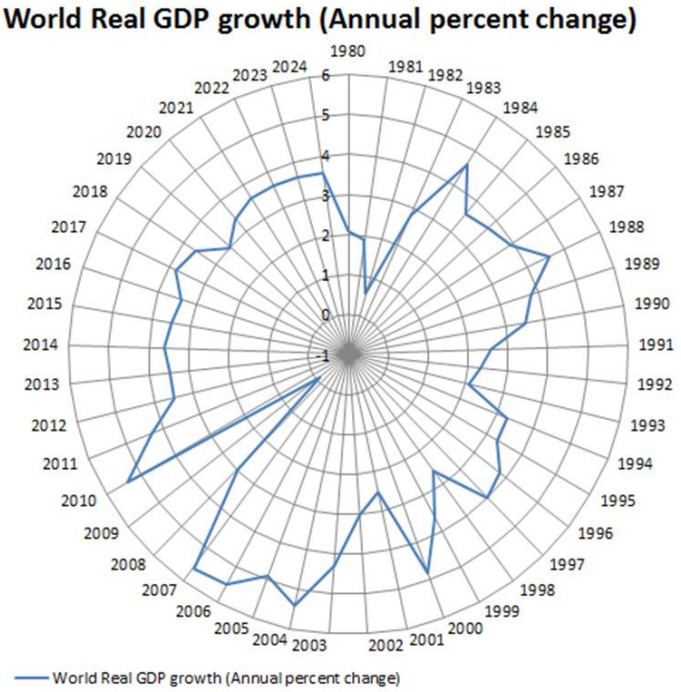

Figure 3. World GDP growth, own representation based on IMF data
Source: https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/WEOWORLD

We like it or not, we globally failed to reach the objective of reducing GHG emissions for the last decade, therefore we will have to suffer the consequences.

It is obviously that the data show that all countries have to raise their ambitions expressed by the actual NDCs, in order to get in line with the objective of limiting the warming below 2°C, useless to say that reaching the 1.5°C is almost a utopia at this time. Still, theoretically there is yet a chance, if everybody would have agreed to accept new and more ambitious NDCs that should have been applied immediately and in an accelerated manner. The researcher of Emissions Gap Report reached to the conclusion that continuation of current policies would go to a

rise of temperature of 3.7°C by 2100. Implementing the current NDCs would only make the temperature to reach 2.9°C by 2100 which is obviously not enough compared to the initial ambitions.

There are few strategic options to enhance NDCs, which we classified in four main groups:

GHG target	Sectorial non-GHG target	Policies and actions	Alignment of implementation of existing NDC objectives with long term ambitions
Increase in the level of urgency of existing GHG target	Increase in the level of urgency of sectorial non GHG target	Reinforcement of the actual policies and actions and control	Pledge to achieve the existing NDC through policies and actions that are in line with the long term solutions of decarbonisation
More communication about the benefits of the actual GHG target	Advancement of a sectorial non GHG target	Addition of new innovative policies based on the new evolution	
Reduction in the span to reach the existing target	Assuming and communicating the need to overcome the sectorial non GHG target		
Assuming and communicating the need to overcome the actual GHG target	Adoption of a new sectorial non GHG target		
Adoption of a new GHG target			

Some researchers (UNEP, 2019), in the Emission Gap Report drawn in 2017[iii] revealed a clear assessment of CO_2 reduction options for different sectors. The conclusion is that if there is a common willing we might have a real possibility to reach the 1.5°C target by 2030, if the countries and all concerned entities agree to adopt cost effective technologies and best practices. It is only needed to extend and multiply the existing clean technologies. The results will also bring an important contribution to all SDG indicators.

The results of the report are based only on proven and existing technologies and show that the emission could be reduced by 33 Giga tones CO_2 / year till 2030 (we

considered the average between 30 and 36 Gt CO_2) which is largely sufficient to reach the 2°C objective or even a lower objective.

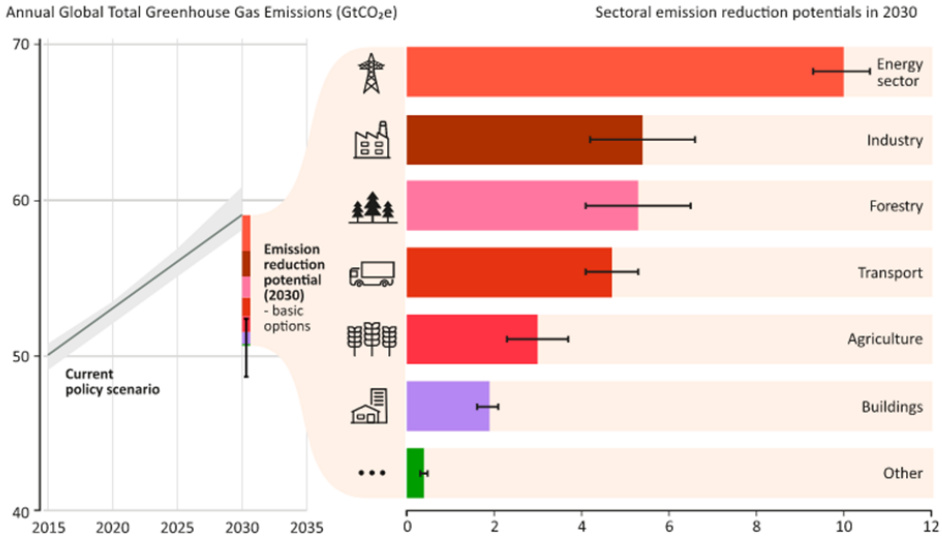

Figure 4. Emission reduction potential

Source: https://wedocs.unep.org/bitstream/handle/20.500.11822/30022/EGR10.pdf?sequence=1&isAllowed=y

We could also see that there is a big potential in certain area like solar and wind energy, efficient appliances, intelligent passenger car transport systems, stopping deforestation and initiating reforestation, efficient buildings and productive agriculture. Only these areas have together a potential of reducing up to 21 Gt CO_2 / year that would be enough to push the global temperature down to the 2°C objective. Not to mention that it is highly probable that till 2030 other areas or new technologies to bring their contributions to emission reduction, which means that today we have the possibility to reach the threshold of 1.5°C.

Nevertheless, we have to admit that these calculations are true only if all countries will start immediately to implement the most effective measures which are a theoretical assumption, considering that there are different economic policies in line with the local context. Still, it was proven that if wanted, we have all conditions to take action.

CO_2 emissions coming from fossil fuel consumption in the energy, transport and industrial sectors are representing the main part of GHG emissions. The researchers from the International Environment Agency (IEA, 2019), whose results are published in World Energy Outlook, found that the energy demand will raise by 1.3% each year to 2040, with increasing demand for energy services which make an obligation for the industry to improve its efficiency[iv]. In other words, we may conclude that the energy needs will increase by around 30% until 2040. This growing demand is nourished by the growing of population, the overall economic

growth mainly in the sectors of urbanization, transport, industrialization, infrastructure and growth of a world middle class. It is clear that the need to change the production lines of energy is immense but also the way we consume it, if we really want to achieve the Paris Agreement objective.

Fortunately, we can see quite a dramatic change in this sector in the forthcoming years. The technological advance is shared among all countries due to foreign investment; therefore the following graphic is very representative for energy future sources.

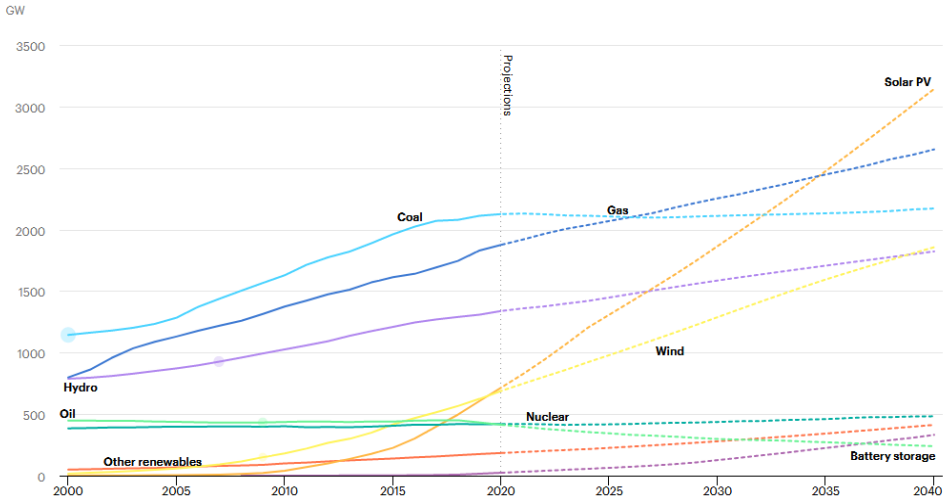

Figure 5. Power generation capacity by source - 2000-2040
Source: https://www.iea.org/reports/world-energy-outlook-2019

It is predicted that up until 2040 low-carbon energy sources to provide more than 50% of the total electricity production, while hydropower and nuclear will continue to have an important share - 15 and 8% from total.

Globally, the number of power plants using coal continues to grow, as do the emissions of coal. If we add the existing capacity to what is currently planned and under construction (assuming lifespans and standard utilization rates), we can see that it represents a significant part of the carbon budget available for a target of 2°C and would probably make the objective of 1.5°C impossible to ever reach. It is crucial to create a system that will allow the transition from coal to electricity if we want to have a real chance in achieving the target. We should start by cancelling new coal-fired power plant opening and continue with new energy alternatives solutions. For sure, the task is not easy since we have to take into consideration the affected workers, communities as well as industry owners but also the real new energy alternatives possibilities existing on the ground.

If we really want to move forward from the coal power production, we have first to stop the opening of the new facilities and then to find the best option to get out from the coal industry. There are only 10-11 countries in the world that are

producing significant coal emission and therefore finding the best solutions for a transition phase is very important in order to get them on board. We have to agree that because of the new energy equation, we will see affected workers communities, owners and other parallel industries that will suffer – therefore we have to be prepared to compensate their loss.

The Emission Gap Report of UNEP from 2018 shows that there are a massive increasing number of organisations willing to participate in climate action: "more than 7,000 cities in 133 countries and 245 regions in 42 countries, as well as more than 6,000 companies with at least $ 36 trillion in revenues" had pledged for mitigation actions.

Many players engage in "international non-state cooperation and subnational players are essential, but the actual mitigation effects are still limited and poorly documented initiatives". Obviously, it is an impressive number, but there is a huge potential for improvement. According to the available information, around 20% of the world population is taking part in the national or international environment actions; therefore, we can consider there is huge space for improvements all over the world. Still in the next years we have to look more into details about these aspects, since there are not sufficient data yet.

2. Conclusion

It is clear that, in order to reduce GHG emissions, the only solution is combining innovation with existing technologies together with a transformation of people behaviour. In any case, this will not happen naturally, therefore we should take into consideration few important steps in order to succeed:

1. The only organisation that can assume the leading role is the public and not the private organisation, therefore they should be ready to take the risks.
2. Public organisations have to share honest feedback with all other interested organisations in order to let private investments to undertake initiatives in different projects.
3. We should have a unique green policy, known and accepted by everyone − in any case, we should not have different sectors fighting each other in order to have the best positions.
4. The innovation area should be encouraged to search more into GHG reduction emissions and consequently to produce more results that could be shared with the players.

Almost everybody (except few climate sceptics) is accepting that we have a real problem regarding the global warming due to GHG emissions – if we are honest, it is visible. If we take into consideration that this was known and predicted long time ago, seeing the actual situation, we have to admit that the past decade has been a missed opportunity in terms of reducing the global emissions. We have to say that a large number of positive political and technological developments have happened, which founded a solid base foundation for future actions. Obviously, there is still much more work to do in order to find the best solutions in term of

cost, efficiency, long term investment, stakeholders affected – the ultimate objective being zero CO_2 emissions. The next 10 years will be crucial with no coming back options or shy measures if we really want to attain the Paris Agreement objective.

References

[1] IEA (2019). World Energy Outlook 2019, IEA, Paris https://www.iea.org/reports/world-energy-outlook-2019.

[2] International Monetary Fund. World Economic Outlook (2019). Available at https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/WEOWORLD.

[3] UNEP. The Emissions Gap Report (2017). Nairobi: United Nations Environment Programme (UNEP). Available at: unenvironment.org/emissionsgap.

[4] World Population Prospects: The 2019 Revision. Available at https://population.un.org/wpp/.

[i] https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/WEOWORLD.

[ii] https://www.worldometers.info/world-population/world-population-by-year/.

[iii] https://www.unenvironment.org/resources/emissions-gap-report-2017.

[iv] https://www.iea.org/reports/world-energy-outlook-2019.

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Study on the Development Strategy of Mihai Viteazu Township

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Abstract

The purpose of this paper is to prepare an analysis of the objectives proposed in the 2014-2020 development strategy of Mihai Viteazu Township, using the SOWT model.

The intended effects are to improve the quality of life of the inhabitants of Mihai Viteazu Township, so the best alternatives are in the short term to increase the financing rate of the works in progress and to prepare major medium- and long-term infrastructure projects in energy, communications, agriculture, health, sports and education meant to have a special impact on local development.

Tourism, too, is a viable alternative with great resources and can be a sustainable industry. Support for this branch by European rural development programmes can lead to additional revenue for farms located in high potential areas.

The programmes that Mihai Viteazu supported for the business environment in the tourism and tourism sector consist of granting fiscal facilities and exemptions from taxes and duties.

Keywords: rural development, analysis, investment, tourism.

JEL Classification: Z3

1. Introduction

The purpose of this study is to carry out a SOWT analysis for Mihai Viteazu Township under its many facets, focusing on rural development concepts in terms of sustainability and multi-functionality. In this context, we note that Romania is currently implementing the European model of sustainable agriculture and rural development and tourism development strategies.

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At the level of Cluj County, an action plan has been established as a priority approach for the 2014-2020 programming period, developing and updating development strategies.

Strategy is to maximize the chances of Mihai Viteazu and the members of the community to obtain non-reimbursable funds for the economic and social development of the community.

In the light of the need for economic, social, administrative and common infrastructure development, Mihai Viteazu has carried out this strategic development plan. The local development strategy of Mihai Viteazu Township for the 2014-2020 period was carried out through the involvement of stakeholders at the level of the township.

The Township of Mihai Viteazu is part of the Land of Transylvania, a region situated in the south-eastern part of Cluj County, at the western border of the Transylvanian Plain, mostly Turda – Câmpia Turzii Depression, formed by the middle and lower course of Arieş River. With an area of 47.53 km² and 4,753 ha, of which 1,129 ha (Mihai Viteazu 880 ha, Cheia 114 ha, Corneşti 135 ha). The village of Mihai Viteazu is located along the national road #75 Turda – Camceni, 6 km from Turda.

2. Problem Statement

Sustainable development is also important for future generations. We cannot just consume, we must leave something behind for those who will be in rural areas (Fistung, 2015, Toth et al., 2016). Agriculture and tourism activities rely on experienced people who are able to devote themselves to the benefit of the community (Qiu, et al., 2019).

Sustainability is the quality of an activity to be carried out without exhausting the resources available and without destroying the environment, so without compromising the possibilities of meeting the needs of future generations (Burja and Burja, 2013, Tiscus et al., 2016, Hăbac-Cotoar-Zamfir Al., 2019).

The concept involves striking a balance between economic growth and environmental protection and finding alternative resources (Frione and Frione, 2015, Xu et al., 2019). So, in rural areas, an attempt will be made to introduce environmentally friendly alternative energy, to reduce the amount of waste produced, and to organize environmental actions, to develop the community and to develop green activities such as tourism and agriculture, forestry (Clifford and D'Alessandro, 2019; Guaita Martinez, et al., 2019, Erbauch et al., 2019).

Romania, together with 192 other countries, has committed to setting the national framework to support the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals and Action Agenda at the Addis Ababa. The global action plan, which Romania chooses to support in the coming years, is aimed at improving poverty, tackling inequalities, social injustice and protecting the planet by 2030. It is an action plan for people, the planet and prosperity aimed at strengthening a safe and secure environment. The economy, society and the environment are the main co-ordinates for sustainable development.

In line with these aims, we have analysed the implementation of the 2014-2020 development strategy of Mihai Viteazu Township.

Around 200 economic operators are registered in the area of Mihai Viteazu Township, in various fields such as trade, construction, agriculture, services, industry. Most companies registered on the administrative territory of the township are operating in the field of services and trade, but the main activity of the inhabitants of Mihai Viteazu Township is agriculture.

Given the number of people and their distribution by villages belonging to Mihai Viteazu Township, it can be seen that Mihai Viteazu Village has the highest share in the stable population, with a 76% share, Cornești Village 14%, Cheia Village 10%. According to the data taken from the Agricultural register of Mihai Viteazu Township, in the locality there are a total of 2,534 agricultural households with 1,897 entries in Mihai Viteazu, 355 in Cornești, 282 in Cheia.

The development of the basic infrastructure was the first strategic objective of the Township of Mihai Viteazu. The following measures have been taken to achieve this: the rehabilitation and development of local and adjacent roads. In the 2014-2016 period, most roads in Mihai Viteazu Village were paved, with investments amounting to over RON 2,088,016. Between 2014 and 2017, in Mihai Viteazu Township, the main street was arranged with concrete tiles on a surface of 8,687.35 square meters. Also, in 2014, through an investment project worth RON 585,000, the roadsides of all three villages that belong to the construction of 5,602.70 square meters of pavement and concrete tiles and 66 linear metres of concrete rigid sheets were arranged. Provision is made for a sewerage network on all streets of the locality, carried out by the rural infrastructure development programme, set up by the Ordinance no. 7 of 2006. The rehabilitation of the drinking water supply system in Cheia Township, Mihai Viteazu Township, Cluj County was another objective. The measure of modernization and expansion of the public lighting network was achieved through the implementation of a public lighting project worth RON 1,363,700 for led lamps rehabilitation.

The second objective was to increase the tourist potential of the Township of Mihai Viteazu. The Europe for Citizens programme was inaugurated: The Community programme undertaken by the European Commission's Directorate-General for Migration and Home Affairs, which aims to promote active European citizenship by involving civil society in building a united Europe based on historical values and recap a common past, deepening intercultural dialog and concepts such as tolerance, solidarity, democracy, equal opportunities and mutual understanding.

Municipal support and promotion, the promotion of the township (website, local presentation brochure, leaflets with the opportunities of the township) were objectives worth RON 9,920.

The sustainability of the Mihai Viteazu Township has been achieved through the following measures: integration of local producers in the agri-food chain, development and rehabilitation of green areas in the locality.

A sorting station, consisting of administrative building and sorting hall, equipped with baling machines, of selected waste, on a public property made available by Mihai Viteazu Municipality and the improvement of the quality of life in Mihai Viteazu Township was achieved through the following actions: Modernization and renovation of Mihai Viteazu joint dispensary, modernization of the stadium and the village park.

The kindergarten from Mihai Viteazu Township has been renovated. According to the project implemented, it includes 8 classrooms, a gym, a sports hall, a table room, documentation and information centre, office, a kitchen and several bathrooms.

3. Research Questions

According to the study conducted in the form of a questionnaire, in the following we will detail the following questions:

How was the rural development strategy of Mihai Viteazu Township implemented?

The first development strategy of Mihai Viteazu Township was carried out in 2014, through alternative efforts and consultation of the representatives of the institutions, the business community, governmental organizations, the citizens of the township, in a process coordinated by a team of consultants and specialists of the City Hall. Mihai-Viteazu is now and in the future based on a comprehensive study, approved by the Decision of the Local Council no. 266/20.07.2014, a document which gives concrete expression to sectoral strategies and policies and the projects resulting from them, being financed from any relevant sources such as local, national, European, international.

How much money has been allocated to increase the sustainability of the rural area in Mihai Viteazu?

Following the study carried out for 2014-2020, Mihai Viteazu Township prepared feasibility studies for the restoration and modernization of infrastructure, agriculture, health, sports and education worth RON 17,766,182.

Who were the beneficiaries of each project carried out to improve the quality of life in Mihai Viteazu Township?

At the same time, Mihai Viteazu aims to identify and develop project ideas with multisectoral and regional impact, operationalized based on identified needs. These portfolio ideas will be proposed to the local institutions receiving 5 financial resources for development projects.

The last question asked is: What are the perspectives for development in Mihai Viteazu Township?

Accessing projects with non-reimbursable funds from the European Union;

Supporting cultural and sporting activities for young people and citizens of township;

Residential construction for young people through the ANL;

Improving educational infrastructure through the modernization of all school premises and kindergartens in the township;

Setting up a home and social centre for the elderly.

4. Research Methods

Following the deployment and analysis of individuals, the main strategic issues and the broad lines of development have been identified. On this basis, this development strategy sets out the main general objectives for the period 2014 to 2020. They shall aim at:

- Building awareness and skills development for the local population,
- Improving the quality of life of the inhabitants,
- Ensuring the economic sustainability of the township,
- Enhancing natural and cultural heritage,
- Building basic infrastructure;

The general objectives listed above have been divided into specific objectives and project ideas.

In this regard, we inform you that we performed the on-site documentation, collected information from Mihai Viteazu Township and analysed the strategy implemented by the regional Ministry of Development and investigated statistical data from the National Institute of Statistics (data on local community, economy, agriculture).

From a strategic point of view, the data taken provide an important starting point in supporting important strategic steps, carried out by Mihai Viteazu Township, thus preparing future projects. In practical terms, the adequacy of the research methodology and quality of life concerns related to the regional context can provide useful solutions for a better absorption of European funds and for their allocation in priority areas of the township.

5. Findings

How was the rural development strategy implemented by Mihai Viteazu?

It has been phased out and focused on 3 strategic objectives: developing basic infrastructure, harnessing the potential of tourism, ensuring sustainability and improving the quality of life of local residents.

How much money has been earmarked to increase the sustainability of Mihai Viteazu rural area?

Investments over RON 2,088,016 to modernize the infrastructure. Public lighting rehabilitation with led lamps worth RON 1,363,700. The municipal support and promotion, the promotion of the township (website, local presentation brochure, leaflets with the opportunities of the township), worth RON 9,920.

Construction of an all-day kindergarten, a project worth RON 2,457,000.

The development and modernization of the sports infrastructure through the modernization of the stadium was RON 1,119,978.11.

The construction of a clinic is a project worth RON 700,000.

The rehabilitation of the drinking water supply system in Cheia Township, Mihai Viteazu Towshnip, Cluj County has an allocated budget of RON 8,755,910.

The total amount of investment for the development and joint sustainability of Mihai Viteazu Township was RON 16,494,524.11.

Who were the beneficiaries of each project carried out to improve the quality of life in Mihai Viteazu Township?

The beneficiaries were the residents of Mihai Viteazu Township, tourists, local organizations and public administration.

What are the prospects for development in Mihai Viteazu Township?

Better life and higher living standards, decent conditions for health and education, strategies that make people develop local businesses (agriculture and tourism).

SWOT analysis of the development programme for Mihai Viteazu Township

The SWOT analysis requires development scenarios that are the result of a balancing of all possible alternatives, at different scales of approach and territorial entities with varying degrees of homogeneity. The acronym has its origin in the English caps for strengths, weaknesses, opportunities, and threats.

The comparative analysis is used to highlight the characteristics of concepts analysed and are based on a comparison of the results of rural policy measures, methods of management and the comparison of the overall results of rural resource exploitation systems.

The SWOT analysis method is an important method of strategic management. From the point of view of the rural economy, the SWOT analysis provides a complete picture of the rural area by studying at the same time its internal characteristics and external influences, considering both positive and negative variables.

The strengths worth mentioning are: drinking water distribution network throughout the township area; road network; all-day kindergarten; sports hall and sports field; clinic and medicines; dentistry office; coexistence of several nationalities, cultural, linguistic and religious interference with a wide variety of traditions and customs; human resources with varied qualifications; old traditions in the processing of some local resources; special tourist potential due to the cultural heritage and architecture; existence of programmes to support investments in the field of environmental protection and rehabilitation of the drinking water systems, sewage, water treatment and waste management; modernization of telecommunications equipment and extension of landline and mobile telephone network.

Weaknesses: poor capitalization of businesses, especially SMEs production plants; insufficient tourism promotion; insufficient staff qualified to provide the quality tourism jobs; absence of railway; transport infrastructure, telecommunications and equipment with inadequate technique in certain areas;

increased unemployment rate, due to restructuring; poor capitalization of businesses, especially SMEs production plants; reduced foreign capital investments in the local economy; insufficient tourism promotion; lack of a tourism concept that makes it possible to promote a unitary product in the country and abroad; poor quality of services and information tourism; low interest and entrepreneurial spirit of the rural population for tourism activities; lack of interest for tourism as potential for business and for the creation of new jobs; insufficient staff qualified to provide quality tourism jobs.

Regarding Opportunities and Threats, we can present what we discover after a deep analysis of the 2014-2020 rural development strategy in Mihai Viteazu Township.

Firstly, the Opportunities are as follow: location in an environmentally developed region with a tourism value potential; development of tourism by creating a network; enhancement of historical sites and monuments national heritage; increased interest in international tourism; development of complex tourist products; the available workforce that can be attracted to the system of tourist services and accommodation units not used at full capacity; harnessing human potential, preserving traditions, cultural and urban customs in order to transform the locality in a powerful tourist centre; creation of regional national funds to support regional and local development; national and regional programmes for mitigating and preventing pollution; improvement of the environmental law; internalization of environmental protection costs; introducing the obligation of EMS (Environmental Management Systems); The natural and urban heritage represents a basis of departure for the diversification of international tourism.

Secondly, the Threats are as follow: migration of young residents to other areas in the country and abroad; legislative instability, high taxation makes small entrepreneurship difficult; insufficient support for the SME sector (lack of facilities); inability to cope with competition from localities in the area or in the region in terms of attracting investment and economic development; high probability of unpredictable natural phenomena, floods, landslides, massive snow falls; danger of flora and fauna degradation in protected areas as a result of uncontrolled tourism; danger of degradation of valuable buildings in case that their protection and maintenance is not ensured; low payment capacity of consumers for the services offered; additional expenses to combat the effects of natural calamities; insufficient support for tourism development, in particular in rural areas; poor involvement and understanding by public authorities for the proper exploitation of the environment and a of the territory, for the benefit of tourism development.

6. Conclusions

In conclusion, Mihai Viteazu is today a modern rural settlement, which has the necessary facilities and provides the over 5,700 inhabitants with conditions for a decent material and spiritual life. It has been successful in promoting sustainable

employment and supporting labour mobility, promoting social inclusion, combating poverty and discrimination. Investment in education, training and vocational training for skills and lifelong learning, improving access, use and quality of information and communication technologies, strengthening the institutional capacity of public authorities and stakeholders for efficient public administration has been carried out.

The implementation of the strategy will take place in stages that will be organised according to the resources available at that time and local priorities. The validation of the strategy is achieved through the participation of citizens in the administrative decisions, this having a continuous character. The community will develop during the implementation of the strategy through exchanges of experience with European institutions and through special input.

Following the strategic elaboration process, fundamental practical points must be retained in order to restore and maintain a rational balance, in the long run, between the economic development and the integrity of the natural environment of the township:

- Mihai Viteazu Township meets all conditions for raising the standard of living of the community, which is possible only through the recovery and development of the economy;
- Socio-economic development by encouraging and supporting local businesses, initiating actions to protect and preserve the environment, will have positive effects;
- European rural development programmes are viable alternatives, with a special impact on local development;
- Guaranteeing the access to infrastructure (water, gas distribution) of the popup and of the economic consumers, but also the optimization and development of the transport, telecommunications and energy infrastructure;
- Ensuring the quality of educational services by rehabilitating the educational infrastructure (promoting learning, preventing school dropout, increasing the quality of teaching);
- Tourism in the Romanian rural area is a viable alternative, with a special impact on local development and is supported by European rural development programmes.

References

[1] Burja Camelia, Burja Vasile (2013). Education's Contribution to Sustainable Economic Growth in Romania, *Procedia − Social and Behavioral Sciences*, 81, pp. 147-151.

[2] Clifford, L., and D'Alessandro, S. (2019). Understanding why: Push-factors that drive rural tourism amongst senior travelers. *Tourism Management Perspectives*, [e-journal], 100574, https://doi.org/10.1016/j.tmp.2019.100574.

[3] Erbaugh James, Rosina Bierbaum, Guillermo Castilleja, Gustavo A. B. da Fonseca, Steffen Cole Brandstrup Hansen (2019). Toward sustainable agriculture in the tropics, *World Development*, 121, pp. 158-162.

[4] Guaita Martinez, J. M., Martin Martin, J. M., Salinas Fernandez, J. A., and Mogorron-Guerrero, H. (2019). An analysis of the stability of rural tourism as a desired condition for sustainable tourism. *Journal of Business Research*, [e-journal], 100, pp. 165-174, https://doi.org/10.1016/j.jbusres.2019.03.033.

[5] Fistung, F. D., Popescu, T., Sima, C. (2015). Interferences between Sustainable Mobility and Economic Development in Romania, *Procedia Economics and Finance*, 22, pp. 36-44.

[6] Frone, D.-F., Frone, S. (2015). The Importance of Water Security for Sustainable Development in the Romanian Agri-Food Sector, *Agriculture and Agricultural Science Procedia*, 6, pp. 674-681.

[7] Hălbac-Cotoară-Zamfir, R., Saskia, K., Zahra, K. (2019). The impact of political, socio-economic and cultural factors on implementing environment friendly techniques forsustainable land management and climate change mitigation in Romania, *Science of The Total Environment*, 654, pp. 418-429.

[8] Tisca, I. A., Istrat, N., Dumitrescu, C. D., Cornu, G. (2016). Management of Sustainable Development in Ecotourism. Case Study Romania, *Procedia Economics and Finance*, 39, pp. 427-432.

[9] Toth, A., Mateoc Sîrb, N., David, S., Mateoc, T., Sârb, G. (2016). Organic agriculture: An opportunity for sustainable development of Romanian villages, *Journal of Biotechnology*, 231, Supplement.

[10] Qiu, S., Cai, L., Lehto, X., Huang, Z., Gordon, S., and Gartner, W. (2019). Reliving self-presentational concerns in rural tourism. *Annals of Tourism Research*, [e-journal], 74, pp. 56-67, https://doi.org/10.1016/j.annals.2018.10.005.

[11] Xu Ming, Yuanyuan Cui, Meng Hu, Xinkai Xu, Shen Qu (2019). Supply chain sustainability risk and assessment, *Journal of Cleaner Production*, 225, pp. 857-867.

[12] National Statistical Institute (2019). *Statistical Yearbook 2018*.

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Local Communities and Eco-Tourism: Attitudes of Residents towards Conservation and Eco-Tourism in Yammouneh Nature Reserve of Lebanon

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Abstract

Scholars believe that tourism is an essential tool of income creation for communities living in rural areas. However, excluding the local community from the planning and management of tourism may lead to undesired results in rural destinations, and sometimes conflicts and backlashes may occur harming the natural heritage.

In Lebanon, rural tourism witnessed an increase of share within the tourism industry. However, it still encounters challenges when it comes to involving the local community in the tourism management process.

This research aims to analyse the locals' opinions and preferences, in order to determine strategies, attain the participation of local people, and assess their opinions and attitudes toward the eco-tourism in Yammouneh reserve.

Keywords: Ecotourism, Tourism, Yammouneh nature reserve, Lebanon.

JEL Classification: L83

1. Introduction

There has always been a strong bond among protected areas conservation, eco-tourism management and the integration of local residents. IUCN (International Union for Conservation of Nature) defines a protected area as a geographical area that is controlled by legal or other effective means in order to preserve nature in the long term through ecosystem services combined with cultural values.

In many countries, protected areas will only be sustainable if local communities become a vital part of conservation efforts and receive economic benefits from

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those efforts (MacKinnon 2001). Ecotourism is the safest way to provide economic benefits for local communities and to finance protected areas for conservation and management.

Hector Ceballos-Lascurain defines ecotourism as responsible journeys to natural areas to enjoy nature promoting conservation with low negative visitor impact and socio-economic benefits for population. This definition has been adopted by the International Union for Conservation of Nature (IUCN) during the 1st World Conservation Congress (Ceballos-Lascurain & IUCN, 1996).

Involving the local community in ecotourism and protected areas management is crucial for developing a successful management plan, and it was recommended at the IVth World Parks Congress from Caracas - 1992 (Thomas, Middleton & IUCN, 2003).

Five levels of participation were defined by the World Commission on Protected Areas (WCPA) in the Programme dedicated to Protected Areas by IUCN. While the first level is only informing locals about the management plan, other levels comprise consulting them, deciding together or working together. However, the highest level of participation is to support the community with information and experts to help them make informed decisions (WCPA & IUCN, 2003).

2. Problem Statement

Known for its unique Mediterranean climate, Lebanon remains one of the most attractive sites in the Middle East for its richness in biodiversity. With a very small surface area (10,452 km^2), Lebanon boasts to have one of the highest densities of floral diversity in the Mediterranean basin. Seven Nature Reserves were officially established in order to protect endangered species and conserve their habitats covering nearly 5% of the overall area (MOE[5] Lebanon). However, there are still challenges in achieving sustainable development of these nature reserves, as Yammouneh nature reserve is experiencing destroy of its ecological system by the locals who are not warned.

Ecotourism can be considered a strategy to support conservation, but also a revenue generator for the communities in which it is practiced. Its advantages are multiple, contributing both to economic development and to the conservation of the protected area by: generating income useful for the sustainable management of protected areas, job creation, but also the development of a sense of common ownership. However, if it is not carefully managed and planned to create a balance of its objectives (ecological, social, economic), it can cause damage to the environment (Jalani, 2012).

It is also known that community-based ecotourism (CBET) refers to responsible tourism in natural areas, conserving the environment and improving the wellbeing of locals. Community-based ecotourism can increase employment opportunities and empower the local community (sustainable development) (Ma, Yin, Zheng, & Hou, 2019).

[5] Ministry of environment.

In the meantime, the ministry of tourism in Lebanon launched the Rural Tourism Strategy for Lebanon in 2014 with one of its main strategic objectives "Improved quality of visitor experience in rural areas of Lebanon" (Ministry of Tourism Lebanon, 2015). Still, involving the local community in the conservation and protection of rural destination remains one of the big challenges.

Since its establishment, Yammouneh reserve management has encountered problems mainly due its relation with the local community and their poor knowledge about the management decisions in the nature reserve. Moreover, locals still face problems starting new tourism projects due to their poor experience in the field and lack of support from experts. While tourism is quite good in the region, yet ecotourism remains unfamiliar in Yammouneh nature reserve. There is no state control over activities harming the environment, no public support for ecotourism endeavours, all in addition to insecurity and poor awareness.

Yammouneh natural reserve is located in Bekaa Valley in Lebanon at a height starting 1300m to 3088m above the sea level with highly particular characteristics.

The region is located in north Lebanon on the eastern slopes of the Mount Lebanon chain, below the highest peak of Lebanon "Qornet El Saouda" (3083 meters above mean sea level), and covers approximately 170 km^2. The study area is composed of two different regions: the Legal Reserve (LR) and the Conservation Region (CR) (Green Line Association, 2001).

Yammouneh is an area between Asia and Africa in the Eastern Mediterranean. The fresh water that can be found here is very important both for animals and for plants (fish, birds, reptiles, junipers, cedars). There are also therapeutic plants with high potential and important for economic development. Here one can also find goldfish, considered extinct in this environment, but which was recently found in small ponds. There are also many ancient sites in the reservation (the Roman temple and a sacred lake). One can still visit a large water cave west of the temple that fills the lake every spring.

The objectives related to this natural reserve are to preserve its ecosystem, protect the natural resources and rehabilitate endangered species. Thus, this reserve is important for its ecological, cultural and tourism value.

3. Research Questions/Aims of the research

The study was conducted from May till October 2017 using an oral survey by randomly sampling 108 residents, of whom 52 were permanent residents and 56 were seasonal residents (seasonal residents stay in the region mostly in summer and holidays).

The survey measured the residents' knowledge about conservation issues in the Yammouneh natural reserve and the attitudes of residents towards ecotourism in the reserve and any possible tourism venture. Additionally, interviews with local community leaders were conducted to obtain information about community history and to pilot-test and review the survey instrument.

The questionnaire comprised 30 questions covering the following sections: demographic questions, questions about socio-economic conditions, questions

about knowledge regarding conservation and management issues in the natural reserve and questions about ecotourism in the reserve and possible tourism ventures nearby.

4. Research Methods

Survey data were analysed using SPSS (Statistical Package for the Social Sciences) with level of significance set at $p < 0.05$.

Cross-tabulation data using Chi-Square tests controlled for selected variables were used to determine the degree of dependence between independent variables and attitudes towards ecotourism in the reserve. Independent variables included socio-demographic questions, knowledge questions, participation questions.

5. Findings

Table 1. attitudes of permanent vs seasonal residences toward conservation and ecotourism in Yammouneh nature reserve.

	Seasonal Residents					Permanent Residents					P
Attitudes of Residents towards conservation and ecotourism	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	
The reserve is important in the conservation of species and the surrounding ecosystem.	28	28	0	0	0	32	14	4	2	0	0.013
the reserve should be maintained and the conservation laws should be enforced	32	24	0	0	0	30	20	2	0	0	0.319
Tourism is important for the region	32	22	0	2	0	28	21	3	0	0	0.161
Ecotourism is important for the region	22	30	2	0	0	22	28	0	0	0	0.383
Do you encourage tourists to visit Yammouneh	30	24	0	0	2	32	20	0	0	0	0.319
Yammouneh region is ready for tourism investment	18	20	8	8	2	26	16	2	4	4	0.118
Ready to participate in awareness programs about ecotourism and wildlife conservation.	10	32	12	0	0	18	30	4	0	0	0.043
Ready to participate in decision making about the ecotourism management in the reserve.	10	26	14	4	2	26	20	6	0	0	0.002

Source: Authors' own contribution

Table 1 reveals that around 94% of the residents within the study believe that Yammouneh nature reserve is important in the conservation of species and surrounding ecosystem and only 2% of them (they are permanent residents) do not agree with this statement. Thus, this is a good start for any management plan regarding conservation of the reserve.

As for the second statement, around 98% consider that "the reserve should be maintained and conservation laws should be enforced" and 2% (they are permanent residents) were neutral regarding this statement. Accordingly, the residents will respect the laws and abide the rules and regulations enforcement in the reserve.

Regarding tourism and ecotourism, 95% stated that tourism is important for the region and 98% considered the same for ecotourism. Moreover, 98% would encourage tourists to visit the reserve and the surrounding region while only 2% strongly would not (they are seasonal residents).

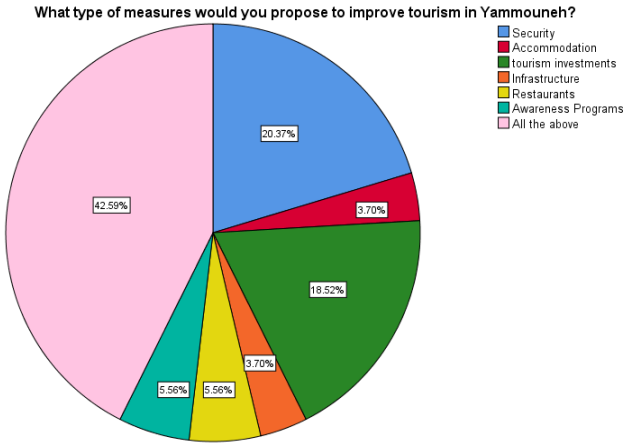

Figure 1. Measures to improve tourism in Yammouneh from residents' perspective
Source: Authors' own contribution

Concerning tourism investment, 74% of the residents think that Yammouneh region is ready for tourism investment, with 52.5% of them being permanent residents. However, 16.6% of the total residents did not agree that tourism investment is possible. Also, 42.59% consider that Yammouneh needs security measures, more investments in lodging, tourism, and restaurants businesses in addition to awareness programs to improve tourism as shown in figure 1.

Table 2. Ability to involve in ecotourism venture frequencies - SPSS output

		Would you like to be involved in ecotourism venture in the future?		
		No	Yes	Total
Are you permanent resident?	Seasonal R	18	36	54
	Permanent R	10	42	52
Total		28	78	106

Source: Authors' own contribution

While 66.7% of the residents have not been involved in a tourism venture before, table 2 displays that 73.5% agree to involve in any possible ecotourism venture, 53% of them being permanent residents. Regarding the type of tourism venture suggested by the residents, 39.13% voted for hospitality businesses, and 19.57% chose ecotourism ventures as displayed in figure 2.

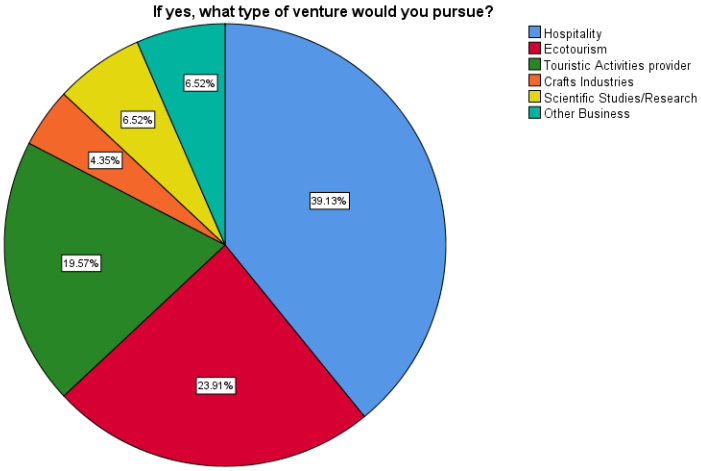

Figure2. Type of tourism venture suggested by residents
Source: Authors' own contribution

From the residents' perspective, Camping and Hiking activities would be the most interesting activities for tourists with 24% and 22.2% of the votes, respectively (see figure 3).

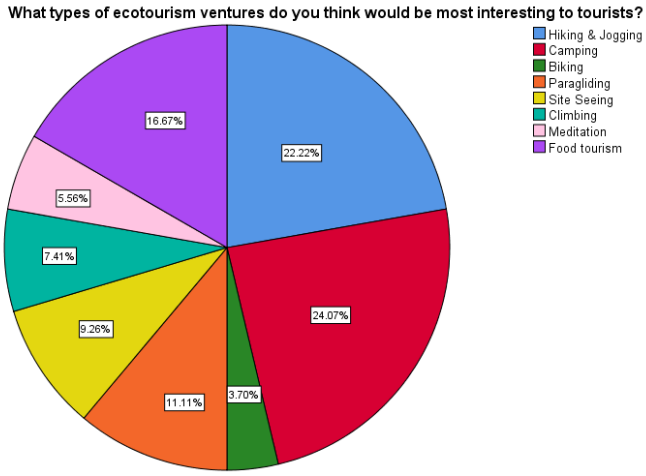

Figure 3. Ecotourism ventures suggested by the residents
Source: Authors' own contribution

As regards locals' involvement in ecotourism activities, awareness program and decision making, the results shows that 83% are ready to participate in awareness programs about ecotourism and wildlife conservation, (53.3% of them are permanent residents).

Moreover, around 80% are eager to participate in decision-making about the ecotourism management in the reserve, 56% of them being permanent residents.

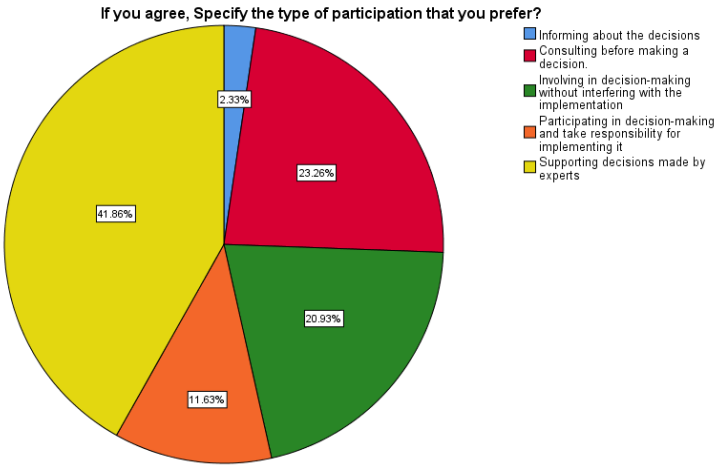

Figure 4. Frequencies of participation Levels in ecotourism management of the Yammouneh nature reserve
Source: Authors' own contribution

Five levels of participation were determined in the questionnaire as defined by WCPA in the Guidelines for Management Planning of Protected Areas. The results in figure 4 show that 41.8% of the residents are in favour of the highest level of participation, which means deciding along the collaboration of experts. Nevertheless, only 2.33% chose to be informed about the decisions without being consulted. This proves that, without the inclusion of residents in the management process, actions plans will be hard to implement in the nature reserve.

6. Conclusion

The permanent and seasonal residents of Yammouneh region were very responsive and supportive of advanced protection measures and showed their willingness to participate in tourism/ecotourism ventures and awareness programs. The only obstacle while dealing with locals was their exclusion from the planning and management process. This led many tourism management plans to perdition. Locals want to be involved in decision-making and implementing processes and have many ideas about tourism and ecotourism in their region. They have the culture to embrace tourism planning. Still, the rural tourism is seen as a trend and not as a culture. Thus, it is crucial to incorporate awareness programs in the rural tourism strategy as well as in the educational system.

References

[1] Ceballos-Lascurain, H. (1996). *Tourism, ecotourism, and protected areas: The state of nature-based tourism around the world and guidelines for its development*. Gland, Switzerland, and Cambridge, IUCN in collaboration with the Commission of European Communities: UK.

[2] Green Line Association (2001). *Biodiversity conservation through sustainable use of natural resources in Yammouneh*, Retrieved from: http://greenline.me.uk/wp-content/uploads/2001/08/Yammouneh-Use-of-Natural-resources-2003.pdf.

[3] International Union for Conservation of Nature (2020). *WCPA publishes a new guide to identifying ecosystem services in protected areas.* Retrieved from: https://www.iucn.org/news/protected-areas/202009/wcpa-publishes-a-new-guide-identifying-ecosystem-services-protected-areas.

[4] Jalani, J. (2012). Local people's perception on the impacts and importance of ecotourism in Sabang, Palawan, Philippines, *Procedia - Social and Behavioural Sciences*, 57, Philippines.

[5] Ma, B., Yin, R., Zheng, J., & Hou, Y. (2019). Estimating the social and ecological impact of community-based ecotourism in giant panda habitats. *Journal of Environmental Management*.

[6] MacKinnon, K. (2001). Editorial. *Parks* 11(2). IUCN, Gland, Switzerland.

[7] Ministry of Tourism Lebanon (2015). *Lebanon rural tourism strategy*. Retrieved from http://www.mot.gov.lb/Content/uploads/Publication/150225013030192~Rural%20Tourism%20Strategy_English.pdf.

[8] Ministry of Environment (2020). *Protected Areas in Lebanon*, Retrieved from: http://www.moe.gov.lb/protectedareas/.

[9] Thomas, Middleton & IUCN (2003). *Guidelines for Management Planning of Protected Areas.* Retrieved from https://portals.iucn.org/library/sites/library/files/documents/PAG-010.pdf.

[10] World Commission on Protected Areas (WCPA) (2003). *Best Practice Protected Area Guidelines Series No. 10 IUCN – The World Conservation Union*. Gland, Switzerland, and Cambridge, UK.

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Effective Web Presence Solutions for Enhancing e-Fashion Customers' Satisfaction

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Abstract

Technology has been changing the way companies interact with their customers, this trend being emphasized during the COVID-19 pandemic. Traditional advertising tools are complemented or replaced by new marketing techniques, and companies are aiming to improve their reach by leveraging social media or the influencer trend. E-commerce makes it possible to browse and compare an ever increasing number of products, and to make purchases from any place with Internet access. Moreover, retailers who incorporate the online world into their business models might face less difficulty during adverse events. However, e-commerce is also defined by fierce competition among companies in their quest for gaining customer satisfaction and loyalty. Buyers can easily abandon their carts and switch to another seller, if the purchasing experience is flawed or another offer is more tempting.

In the fashion industry, e-commerce is particularly challenging, as colors, sizes and quality are still difficult to reproduce in the web-based world. Thus, creating the right customer experience through e-stores can make the difference between success and failure for online fashion retailers.

In this context, the paper is based on a quantitative analysis investigating the relationships between customer perception regarding the quality of product information, navigation ease, the online presence of the web store and customer satisfaction with the purchase.

Keywords: e-commerce, fashion, customer experience, customer satisfaction.

JEL Classification: L81, M1, M3, F23

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1. Introduction

The Internet is now reaching more than 4.57 billion people across the globe (Clement, 2020), facilitating the expansion of businesses' reach over frontiers.

The COVID-19 pandemic pressured companies to find new ways of operating, as can be seen in *Figure 1* on two of the most developed markets, the United States of America and the United Kingdom.

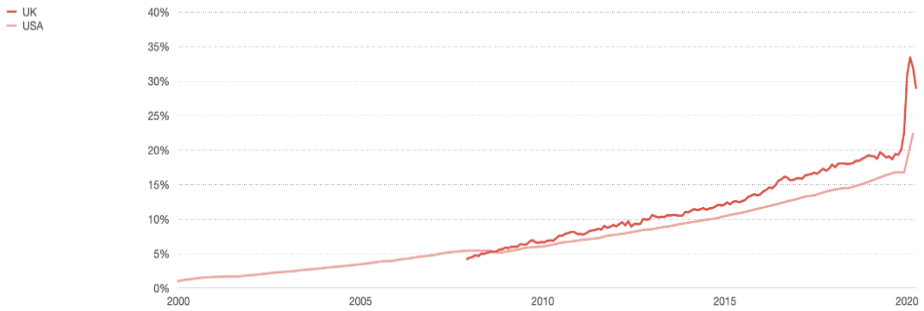

Figure 1. E-commerce as % of addressable retail[5]
Source: Benedict Evans, based on data from ONS and US Census

Within the fashion industry, the winners have been the ones that had digital capabilities, know-how and experience on how to effectively make use of their e-commerce platforms (Gonzalo *et al.*, 2020). Moreover, the effect of the pandemic over online retail could be long-drawn, as part of the consumers might prefer a contact-free approach even after all offline business activities will be permitted, especially helpful for SMEs in their process of surviving while learning (Bratianu *et al.*, 2020).

Authors such as Burgess, Sellitto and Karanasios (2009), Layon (2012), Kovalenko and Kuzmenko (2020), or Dima *et al.* (2018) have undertaken extensive reasearch into web implementation and visibility strategies, developing comprehensive guides that could help companies transition to the knowledge economy, online environment and, more recently, smartphone e-shopping.

The experience provided by fashion brands influences the brand love, brand loyalty and customer satisfaction (Ferreira *et al.* , 2019). However, for e-fashion, the highly competitive online environment, as well as the struggle in bringing the products as close as possible to the customer by providing correct information through the website, make it challenging to achieve customer satisfaction and loyalty. Any flaw in the purchasing experience is a step closer to cart abandonment. Thus, online fashion retailers should devote particular attention to creating a satisfying customer experience.

[5] Excluding cars, car parts, fuel, bars and restaurants. Seasonally adjusted. Quarterly US and monthly UK data.

2. Context

The global market share of the fashion industry has been estimated to reach $1.52 trillion in 2020 (Statista, 2020a). As for e-commerce, fashion is the largest business to consumer (B2C) market segment (Statista, 2020b), with an expected market size of $713bn by 2022 (Research and Markets, 2019).

Fashion is one of the industries facing the *'buying before trying'* consumer skepticism (Blázquez, 2014) due to the key role of the point-of-sales experiences (and trial) for goods such as clothes and accessories.

The world of fashion e-stores manifests high complexity in matters of providing correct information regarding the product's size, quality and other product details which might still be difficult to reproduce through the online environment. This partially explains why the fashion industry was not among the first to transition to e-commerce (Blázquez, 2014). However, it was noted that even the traditional, offline retailers of luxury fashion products are pushed by the new consumption trends to integrate the online environment into their business model (Harba, 2019).

According to McKinsey (2019), the younger generations seem to be open to new approaches when it comes to the fashion marketplace with two driving forces having a particular influence on the future of the global e-fashion industry, namely: (1) young consumers' preferences for new products and services, and (2) the developments in technology and social media.

For instance, digital innovation transforms the way companies sell online, as artificial intelligence (AI) makes it easier for consumers to find and purchase the items they see. McKinsey (2019) and Anagnoste (2018) suggest that e-fashion companies should start adopting robotic process automation (RPA) and application programming interfaces (APIs) in order to integrate cloud-based services, and follow machine learning algorithms that build customer profiles based on both geographical location and individual preferences, chat solution integrations (e.g. Alexa, Siri), mobile app push notifications that keep the customers engaged, secure payment systems and fast delivery. In the years to come, developments in augmented reality could ease the difficulty of providing correct product information.

Furthermore, the younger generations' openness to new online fashion retail approaches makes way for diversified marketing techniques. While advertising on social-media has become common to many brands, the use of social-media to interact with the customers, engage them, get to know them, and build a community is not yet fully mastered by vendors, despite, for instance, of the strong positive correlation found between the number of Instagram posts and customer engagement (Balan, 2017). Also, an extensive presence on social media is often correlated with the relatively new trend of marketing through influencers (Khamis, Ang and Welling, 2017; Stubb, Nyström and Colliander, 2019), which was found to be one of the most successful ways of driving sales (SocialPubli, 2019).

The role of aesthetics in the online shopping environment has also been studied. The website is the main interface between the brand and the consumer, the quality of its design and functionality being critical in producing the right level of

customer experience. Szymanski and Hise (2000) were among the first to notice that website design enhances customer satisfaction, while Kim and Eom (2002) explored the importance of usability in achieving customer satisfaction. Furthermore, authors studying the psychology behind online shopping show that online stores are not only used as facilitators of knowledge, goods or services, but also as places for recreation and entertainment (Ganesh *et al.*, 2010). Therefore, experience becomes the enabler of consumer satisfaction, which positively correlates with the purchasing intention and, more importantly, with consumer long-term loyalty (Dedeke, 2016; Hasan, 2016).

3. Research Aims

The study investigates the link between the quality of product presentation, navigation ease, online presence and customer satisfaction with their purchase from the online fashion store, by testing the following hypotheses:

Hypothesis 1: A higher level of navigation ease within the online fashion store concurs with a higher level of quality regarding the visual and product information design.

Hypothesis 2: A higher level of quality regarding the visual and product information design within the online fashion store drives a higher level of self-reported satisfaction with the order.

Hypothesis 3: A higher level of ease of navigation within the online fashion store drives a higher level of self-reported satisfaction with the order.

Hypothesis 4: The online presence of the fashion web store and the self-reported satisfaction with the order are positively related, mediated by the quality of product information and the navigation design of the online fashion store.

4. Research Methods

A quantitative analysis of data collected through a self-administered online survey addressed to a randomized sample of respondents from Romania was used for hypothesis testing. The sample resulted in 140 valid answers, meeting the requirements for a maximum margin of error of 7% and a confidence level of 90%.

The survey is structured around two sections. The first section is based on 4 items aimed at gathering descriptive data (i.e. gender, age, preference for online vs. offline fashion shopping, frequency of online fashion shopping). The second section is entirely constructed around 30 Likert style items, for assessing the sample's preference regarding some particularities of online fashion shopping. The rating was done on a scale from 1-to-5 with only the ends defined (1 = "strongly disagree"; 5 = "strongly agree"). For answering the questions, the respondents were asked to consider their experience with the most recent online fashion store they placed an order on. The analysis was made through SPSS by performing a factor analysis using the Principal Component Analysis (PCA) extraction method with Varimax rotation, and a reliability analysis. The results were checked against a parallel analysis, and a confirmatory factor analysis (CFA) was further employed

through AMOS, in order to validate the measurement model, ending with the construction of a structural model.

5. Findings

The 140 valid answers come from 57 males and 83 females. Most of the respondents are aged between 25-34 (54%) and 16-24 (30%), followed by 9% 35-44 year olds, 4% 45-54, 2% over 54 and 1% under 16. Concerning their preference for online fashion shopping, 39% of the respondents said they like both online and offline fashion shopping, 36% preferred to shop from physical stores, instead of online, while 25% preferred online fashion shopping over the traditional way. Furthermore, most of the respondents said they shop online for clothes and accessories a few times a year (56%), followed by 37% doing so at least once every month, and 7% at least once a week.

As a result of the factor analysis procedures conducted for the Likert section of the survey (i.e. PCA, CFA, parallel analysis), as well as aiming to maximize the Cronbach's Alpha reliability values for each factor, 14 items were deemed unnecessary and removed, as they did not manage to capture valuable and reliable data for the constructs. The remaining 16 items were split into 4 factors, representing the following areas of interest concerning online fashion retail: (1) the quality level of the media and information design used for presenting the products – named "visual", (2) the level of navigation ease when using the website – named "navigation", (3) the online presence of the web store – named "marketing", (5) the satisfaction and trust the respondent has regarding the online fashion store – named "satisfaction". The standardized regression weights for each item and the Cronbach's Alpha values, based on standardized items, for each factor are presented in Table 1.

Table 1. Factor analysis results

Factor	Item	Standardized factor loading	Cronbach's Alpha
Satisfaction	Based on my past experience, the goods I buy from this store look exactly like on the website (S1)	.734	.863
	I am satisfied with my decision to purchase from this website(S2)	.812	
	Based on my past experience, I believe that the online store is trustworthy (S3)	.575	
	I intend to continue using the online fashion store for purchasing clothing in the future (S4)	.796	
	I would strongly recommend the online fashion store to others (S5)	.821	
Visual	The website of the online fashion store looks professionally designed	.762	.800
	The website of the online fashion store uses high-quality media (pictures and videos) to showcase the products	.693	
	The website of the online fashion store looks clean and harmonious (colors, boxes, menus)	.780	

Factor	Item	Standardized factor loading	Cronbach's Alpha
	In the online fashion store every product has original and detailed information (details on fabrics used, fashion advice)	.599	
Navigation	The website of the online store provides good filters and other navigation tools to search the content	.792	.856
	It is easy for me to navigate the website of the online store	.853	
	The functional layout of the website is user-friendly	.870	
	The website's interface is adapted for smartphones	.603	
Marketing	I have discovered the online fashion store through online advertising	.750	.786
	The online fashion store uses influencer marketing (influencers are presenting products from this brand)	.687	
	The online fashion store has a significant presence on social media (Facebook, Instagram, Twitter)	.788	

Source: Analysis of the dataset in SPSS and Amos

The model has reliability values greater than 0.7 for each of the latent variables, with standardized factor loadings >.5 for each indicator variable. It presents adequate inter-item-correlations to allow for factor analysis according to the Bartlett's test of sphericity having a p-value < .001, and a Kaiser-Meyer-Olkin (KMO) test for sampling adequacy value of .853 > .5. The four factors explain 66.2% of the variance, and the unstandardized regression weights for all items are significant at the .001 level. As available in Table 2, the constructs show no validity concerns, with critical ratios (CR) higher than .7 for all latent variables, and average variance extracted (AVE) values >.5 and higher than their respective maximum shared variances (MSV).

Table 2. Measurement model validity check

	CR	AVE	MSV	MaxR(H)	mk	visual	nav.	satisf.
marketing	0.786	0.552	0.089	0.792	0.743			
visual	0.803	0.507	0.355	0.816	0.217	0.712		
navigation	0.864	0.619	0.341	0.889	0.298	0.491	0.787	
satisfaction	0.866	0.567	0.355	0.881	0.241	0.596	0.584	0.753

Source: Authors' own calculations

The measurement model shows satisfactory fit, according to the ranges suggested by Awang (2012, as cited in Al-Mamary and Shamsuddin 2015), with chi-square = 136.06, df = 98, CMIN/df = 1.388 < 5, CFI = .962 >.9, TLI = .953 >.9, RMSEA = .053 < .8, NFI = .877 >.8, GFI = .888 >.8.

Following with the structural model, a satisfactory model fitness is also observed, with chi-square = 136.93, df = 100, CMIN/df = 1,369 < 5, CFI = .963 >.9, TLI = .955 >.9, RMSEA = .052 < .8, NFI = .877 > .8, GFI = .888 > .8. The magnitude of effects between the structural model's factors is presented in Figure 2.

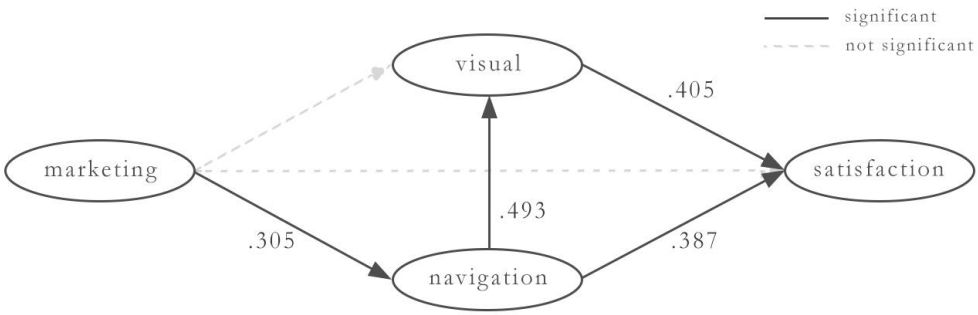

Figure 2. Structural model - standardized path coefficients
Source: Authors' own calculations

The level of *navigation* ease within the online fashion store influences the level of the *visual* presentation of the information, having the highest impact among all structural paths in the model, with a beta coefficient of .493, 95% confidence interval (CI): [.268,.673] p=.011, and, along with the moderate positive correlation between the *navigation* and *visual* latent variables of .491, it is supporting *Hypothesis 1*.

The next largest effect runs from the quality rating of the *visual* and product information design of the online fashion store to the self-reported *satisfaction* of the respondent with their order, beta coefficient = .405, 95% CI: [.157,.613] p=.012. This is supporting *Hypothesis 2*, along with the moderate positive correlation of .596 between the *visual* and the *satisfaction* constructs.

The *navigation* ease within the online fashion store directly influences the self-reported *satisfaction* of the respondent with their order, beta coefficient = .387, 95% CI: [.167,.606] p= .006, and also with a standardized indirect effect = .199 through the *visual* factor. Along with the moderate positive correlation of .584 between the *navigation* and *satisfaction* factors, the findings are supporting *Hypothesis 3*.

The *marketing* latent variable has no significant direct relationship with the *visual* and *satisfaction* ones, however, it has a direct standardized path coefficient of .305, 95% CI: [.086,.533] p=.012, with the *navigation* factor, and an indirect effect of .179 over *satisfaction* through the *navigation* and *visual* factors. The *marketing* variable shows low positive correlations with the *satisfaction* (.241), *navigation* (.298) and *visual* (.217) factors. Therefore, the online presence of the fashion web store has a small indirect positive impact over the self-reported satisfaction with the placed order, mediated by the quality level of the visual,

product information and navigation design of the online fashion store. This validates *Hypothesis 4*.

The predictors for the *satisfaction* factor (i.e. *visual, navigation* and *marketing*) accounted for 46.8% of its variance, the predictors for the *visual* factor (i.e. *marketing* and *navigation*) accounted for 24.3% of its variance, while the predictor for *navigation* (i.e. *marketing*) accounted for 9.3% of its variance.

Table 3. Correlations between the *satisfaction* factor's items

	S1	**S2**	**S3**	**S4**	**S5**
S1	1.000				
S2	.578**	1.000			
S3	.479**	.605**	1.000		
S4	.608**	.648**	.715**	1.000	
S5	.528**	.488**	.521**	.495**	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' own calculations

The *satisfaction* factor's items present moderate positive Spearman's rho correlations, all significant at the .01 level, as available in Table 3. The strongest correlation is .715, showing that *the intention for repurchase* (i.e. S4 as coded in Table 1) has the highest tendency to vary in the same direction with *the trust* the respondents place in the online fashion store (S3), followed by *the satisfaction with previous orders* (S2: .648, S1: .608), and *the intention to recommend* the online fashion store to others (S5: .495).

6. Conclusion

The research confirms the key role of the web store experience, with the *visual, navigation* and *marketing* aspects being linked with the *customers' satisfaction* with the purchase.

More specifically, the four hypotheses were validated, showing that the online fashion stores that provide a higher level customer experience associated with the quality of product information, visual and navigation design can drive higher levels of customer satisfaction, retention and generate leads through customer recommendations. Furthermore, the web store's online presence has no particular direct effect on customer satisfaction, however, it has a small indirect influence over satisfaction through the mediation of the *visual* and *navigation* design of the store.

The limitations of the study come in the form of having an unbalanced mix of respondent ages and genders, as well as a narrow geographical reach. The research may be expanded by investigating the influence of new paths over customer satisfaction, such as the store's policy concerning delivery and payments, or the psychological and affective variables of the customers.

References

[1] Al-Mamary, Y., & Shamsuddin, A. (2015). Testing of the Technology Acceptance Model in Context of Yemen. *Mediterranean Journal of Social Sciences.* 6, pp. 268-273. 10.5901/mjss.2015.v6n4s1p268.

[2] Anagnoste, S. (2018). Robotic Automation Process – The operating system for the digital enterprise. *Proceedings of the International Conference on Business Excellence*, 12(1), pp. 54-69.

[3] Balan, C. (2017). Does brand posting behaviour influence follower engagement on Instagram?, *Proceedings of the International Conference on Business Excellence*, 11(1), pp. 687-697. DOI: https://doi.org/10.1515/picbe-2017-0073.

[4] Blázquez, M. (2014), Fashion shopping in multichannel retail: The role of technology in enhancing the customer experience, *International Journal of Electronic Commerce*. DOI: 10.2753/JEC1086-4415180404.

[5] Bratianu, C., Prelipcean, G., and Bejinaru, R. (2020), Exploring the latent variables which support SMEs to become learning organizations, *Management & Marketing. Challenges for the Knowledge Society*, 15(2), pp. 154-171. DOI: 10.2478/mmcks-2020-0010.

[6] Burgess, S., Sellitto, C., and Karanasios, S. (2009). Effective Web Presence Solutions for Small Businesses: Strategies and Successful Implementation, *IGI Global*. DOI: 10.4018/978-1-60566-224-4.

[7] Clement, J. (2020). *Global digital population as of July 2020*, Statista. Retrieved from: https://www.statista.com/statistics/617136/digital-population-worldwide/.

[8] Dedeke, A. N. (2016). Travel web-site design: Information task-fit, service quality and purchase intention, *Tourism Management*. DOI: 10.1016/j.tourman.2016.01.001.

[9] Dima, A. M., Begu, L., Vasilescu, M. D., Maassen, M. A. (2018). The Relationship between the Knowledge Economy and Global Competitiveness in the European Union. *Sustainability 2018*, 10, 1706.

[10] Evans, B. (2020). *The ecommerce surge*. Retrieved August 31, from https://www.ben-evans.com/benedictevans/2020/8/18/the-ecommerce-surge.

[11] Ferreira, P., Rodrigues, P., & Rodrigues, P. (2019). Brand Love as Mediator of the Brand Experience-Satisfaction-Loyalty Relationship in a Retail Fashion Brand, Management & Marketing, *Challenges for the Knowledge Society*, 14(3), pp. 278-291. DOI: https://doi.org/10.2478/mmcks-2019-0020.

[12] Ganesh, J. et al. (2010). Online Shopper Motivations, and e-Store Attributes: An Examination of Online Patronage Behavior and Shopper Typologies, *Journal of Retailing*. DOI: 10.1016/j.jretai.2010.01.003.

[13] Gonzalo, A., Altable, C. S., and Villepelet, C. (2020). *Fashion's digital transformation: Now or never*, McKinsey & Company. Available at: https://rb.gy/my4x7r.

[14] Harba, J. (2019). New approaches to customer experience: where disruptive technological innovation meets luxury fashion, *Proceedings of the International Conference on Business Excellence*, 13(1), pp. 740-758. DOI: https://doi.org/10.2478/picbe-2019-0066.

[15] Hasan, B. (2016). Perceived irritation in online shopping: The impact of website design characteristics, *Computers in Human Behavior*. DOI: 10.1016/j.chb.2015.07.056.

[16] Khamis, S., Ang, L. and Welling, R. (2017), Self-branding, "micro-celebrity" and the rise of Social Media Influencers, *Celebrity Studies*. DOI: 10.1080/19392397.2016. 1218292.

[17] Kim, E. B., and Eom, S. B. (2002). Designing effective cyber store user interface, *Industrial Management & Data Systems*. DOI: 10.1108/02635570210428276.

[18] Kovalenko, A., and Kuzmenko, Y. (2020). Online marketing.impact on micro-enterprises: an insight through visibility in search engines, *Management & Marketing. Challenges for the Knowledge Society,* 15(1), pp. 38-58. DOI: 10.2478/mmcks2020-0003.

[19] Layon, K. (2012). *Mobilizing Web Sites. Develop and Design.* Berkeley: Peachipit Press. Retrieved from: https://rb.gy/nezred.

[20] McKinsey (2019). *The State of Fashion 2020,* McKinsey & Company. https://www.mckinsey.com/~/media/mckinsey/industries/retail/our%20insights/the%20state%20of%20fashion%202020%20navigating%20uncertainty/the-state-of-fashion-2020-final.ashx.

[21] Research and Markets (2019). *Global Online Apparel & Footwear Market Report: Insights, Trends and Forecast (2019-2023),* Research and Markets. Retrieved: https://www.researchandmarkets.com/reports/4825111/global-online-apparel-and-foot wear-market-report.

[22] SocialPubli (2019). *Influencer Marketing Report: A Marketer's Perspective*. Available at: https://socialpubli.com/blog/2019-influencer-marketing-report-a-marketers-perspective/.

[23] Statista (2020a). *Value of the apparel market worldwide from 2005 to 2020*, Statista. Retrieved from: https://www.statista.com/statistics/821415/value-of-the-global-apparel-market/.

[24] Statista (2020b). *E-commerce report – Fashion*, Statista. Retrieved from: https://www.statista.com/study/38340/ecommerce-report-fashion/.

[25] Szymanski, D. M. and Hise, R. T. (2000). E-satisfaction: An initial examination, *Journal of Retailing*. DOI: 10.1016/S0022-4359(00)00035-X.

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Comparative Analysis of the Concentration Degree and Sustainable Development of the Economic Key Sectors Romania versus UE

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Abstract

This paper aims to analyse, with available or estimated data from competent bodies, the level of concentration of some of the critical sectors in Romania, namely the banking, the cement and the fuel distribution sector, taking into account not only the situation at the national level but also the structure of those markets with other European states. This research focuses on whether the structure of Romania's key sectors is less competitive than in other European countries / European media. Depending on the information available, some analyses are performed considering the number of active competitors on the market, turnover, and production achieved. The approach is not homogeneous from one sector to another, but adapted to the data available for each sector, e.g., the data sources are diversified, internal reports/estimates of various external bodies. The goal is to verify their convergence towards expected results/conclusions to ensure the substantiation of the conclusions. The analysis of three of the most important economic sectors, concerning their impact on the Gross Domestic Product (GDP): banking, cement and fuel distribution, shows that they rank from the level of concentration perspective below the European averages corresponding to those sectors, while there is a low level of penetration - share in GDP.

Keywords: concentration indicators, economic sectors, competition, sustainability.

JEL Classification: M20, D41, C82

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1. Introduction

Sustainability is a multidimensional objective that requires an integrated approach of the social, economic, environmental, and technological environment (Nica et al., 2018).

In 2015, the General Assembly of the United Nations (UN) formally adopted "The 2030 Agenda for Sustainable Development," which provides a framework for "peace and prosperity for people and the planet, now and into the future" (2020). As part of this agreement, all United Nations Member States agreed upon the Sustainable Development Goals (SDGs) that represent a shared expression of stakeholder needs at a global level balancing economic, social, and environmental development. The SDGs comprehend themes such as ending world poverty to undertaking urgent action to combat climate change and its impact by 2030 (Fonseca et al., 2020).

The banking, cement, and fuel industry sectors have a crucial role in fostering the SDGs, e.g., to promote sustained, inclusive, and sustainable economic growth (SDG 8), and build resilient infrastructure and sustainable industrialization and innovation (SG 9).

2. Literature review

According to the structure–conduct–performance (SCP) paradigm developed by Mason (1939) and Bain (1951) when markets have a high concentration (few suppliers), there is a climate that favours collusion activities among firms, positively affecting their profitability. The existence of positive relationships between a firm's market share (MS) and its performance is also proposed by Rhoades (1983) relative market power (RMP) hypothesis. However, higher industry concentration leads to strong firm (supplier) power, and weak buyer (customer) power. And less powerful buyers do not press the suppliers much, which might lead ultimately to lower supplier performance and lesser competitiveness (Porter, 1998). Moreover, the Treaty on the Functioning of the European Union (TFEU) contains rules that aim to achieve a free and dynamic internal market and promote general economic welfare (EU, 2020). They comprehend rules on antitrust, merger control, State aid, and public undertakings and services. Effective competition enables businesses to compete on equal terms and contribute to their continuous quest to offer the best possible products at the best possible prices for consumers, which ultimately fosters innovation and long-term economic growth and sustainability.

Concentration and competition are linked to geographical areas and product markets, both in empirical analyses and theory. For example, banks provide many products that do not serve a unique market, and defining a relevant market involves making a preliminary decision about potentially relevant structural characteristics, such as competition and concentration (Bikker and Haaf, 2002).

The banking, cement, and fuel distribution retail sectors have several particularities to be considered when analysing competition on those markets.

According to a PwC Romanian study (Semenescu and Curmei, 2015), the banking system contributed 4.2% to Romania's cumulative GDP in 2012-2016 when indirect effects on the economy are also considered. The banking sector directly employed an average of 57,887 people in the period 2012-2016 and contributed with another 51,221 in the rest of the economy, thus generating 109,108 jobs in total. The number of employees in the banking industry in 2016 represents approximately 1.2% of the total of 4.8 million employees in the economy, being higher than in 65% of the economic activity branches.

The contribution to the world GDP of the cement industry is significant (Deopale and Ghiculescu, 2019). In 2016, the industry cement contributed 1.9% of the European Union's GDP (EU28). The Romanian cement market was about 7.9 million tons and 2,257 million lei in 2016. From 2007 to 2016, the market registered a negative dynamic. Dramatic reduction from 2009 (74%) was followed by another 12% decline the next year. In 2011, there was an attempt at a weak recovery, but the market volume remained at the same level with small fluctuations in the next five years. As a share in the annual GDP, Romania's cement market, in value, was about 1.5% in the period under analysis (Fedorko at al., 2018).

The retail sector of fuels (gasoline and diesel) occupies an important place in the Romanian economy (Agoston and Dima, 2012), having a direct impact on other economic sectors and consumers. The main characteristics of this sector do not differ much from those of the rest of the European countries, its structure being, in general, oligopoly, with a high degree of concentration with homogeneous goods, high barriers to entry, relatively high transparency and relatively low elasticity of demand with respect to price (Paunescu et al., 1999; Anderson et al., 1999; Busu et al., 2019).

Due to the high level of investment required to enter the market, these sectors are described as sectors with a high market concentration (Busu, 2012; Pjanić et al., 2018; Azar et al., 2020; Busu et al., 2020). However, this is not an issue for the market's competitive functioning, as concentration is sometimes a necessary, but not sufficient, factor in the exercise of over-competitive prices that could affect the final consumers' welfare (Edlin and Emch, 1999; Salaman and Storey, 2005; Sidak, 2006; Ze et al., 2018).

3. Research methodology

The level of concentration of a market provides useful information in evaluating the degree of competition on that market. There are several market concentration indicators based on the calculation of the market shares. Generally, the computation of these indicators is based on the value of the products or services traded. However, they could also be computed as the ratio of the volume of products to the services traded (depending on the specificity of the market).

In general, market shares are computed based on the annual data concerning the value/volume of sales. If very homogenous products characterize the analysed market, then it is recommended to compute the market shares based on sales volumes rather than on sales values.

The leading indicators of the degree of concentration of the market are the following: Concentration Ratio (CR) and Herfindahl-Hirschman Index (HHI). We will analyse the concentration in the selected sectors by using the above-mentioned concentration indicators.

The Herfindahl-Hirschman indicator is the sum of squares of the market shares of all companies on that market. Formally, the indicator is computed as:

$$HHI = S12 + S22 + ... Sn2 \quad (1)$$

where S1, S2, ..., Sn are the market shares of the undertakings in the sector.

Hence, it infers greater importance to the undertakings with a larger market share. HHI is the most used indicator of market concentration by competition authorities. Its value varies between 0 (perfect competition) and 10000 (monopoly).

However, there are no universally accepted levels of this index to classify a market in the following categories: a low concentrated market, a medium concentrated market, or a highly concentrated market.

We give below the levels used by The European Commission, respectively by DOJ-FTC:

Degree of concentration	**HHI value**	
	DOJ*	EC**
Low	[0,1500]	[0,1000]
Medium	[1500-2500]	[1000-2000]
High	[2500,10000]	[2000,10000]

Note: *Department of justice, **European Commission

The concentration rate is the sum of the market shares of the largest companies on the market. Formally, the equation used is:

$$CR(k) = S1 + S2 + ... Sk \quad (2)$$

where S1, S2, ..., Sn are the market shares of the undertakings in the sector.

The formula states that the indicator is based on the top companies in the sector. A small number of undertakings appear to show the oligopolistic nature of the sector (a small number of undertakings control a significant share of the market). Its value varies between 0 (perfect competition) and 100 (oligopoly if $n > 1$ and monopoly if $n = 1$).

3.1. The banking sector

According to the BNR Report on financial stability in December 2018, the Romanian banking sector has the lowest degree of financial intermediation in the European Union. The ratio of assets to GDP being 52.2% in June 2018, a value significantly lower than the EU average, of 208%.

In the period 2008-2017, there is a decrease in the average level of banking assets in GDP, from approx. 400% in 2008-2010, to 250% in 2017, the indicator for Romania varying slightly around 50% in the same period.

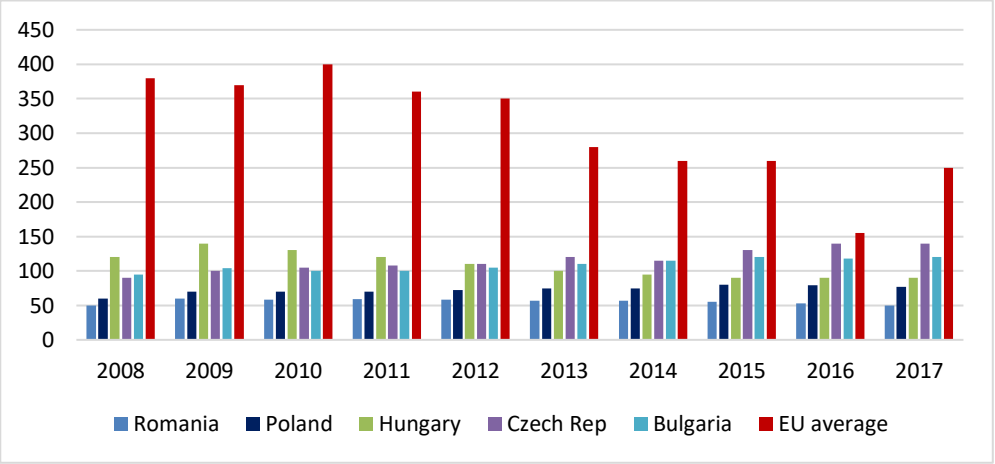


Figure 1. The share of banking sector assets in GDP
Source: BCE, ARB Report

Improving the structural features of banking markets seems to be a way to improve operational efficiency at the European level, stimulating consolidation. Thus, at the European level, mergers and acquisitions have intensified in the last ten years. The number of banks decreased by 1140 during this period. In March 2018, a number of 3874 banking institutions were operating.

This consolidation trend was also manifested in the Romanian banking sector. The number of banking institutions decreased to 35 in September 2018 (of which 7 are branches of foreign credit institutions), compared to a number of 43 active banking institutions in 2009.

Concentration indicators in the banking sector (Herfindahl - Hirschman index for assets was 918 in September 2018, compared to the average value of 1065 recorded in the EU in December 2017, corroborated with the fact that the level of concentration of assets in the first 5 banks in Romania was 60% in September 2018, compared to an average European level of 64% in December 2017) show a relatively low concentration of banking assets in Romania, lower than the EU average specific values.

In addition, using information taken from the European Central Bank, cumulated with that from the European Commission, we obtain the situation of the number of credit institutions per thousand inhabitants below, which shows that Romania is also below this European average.

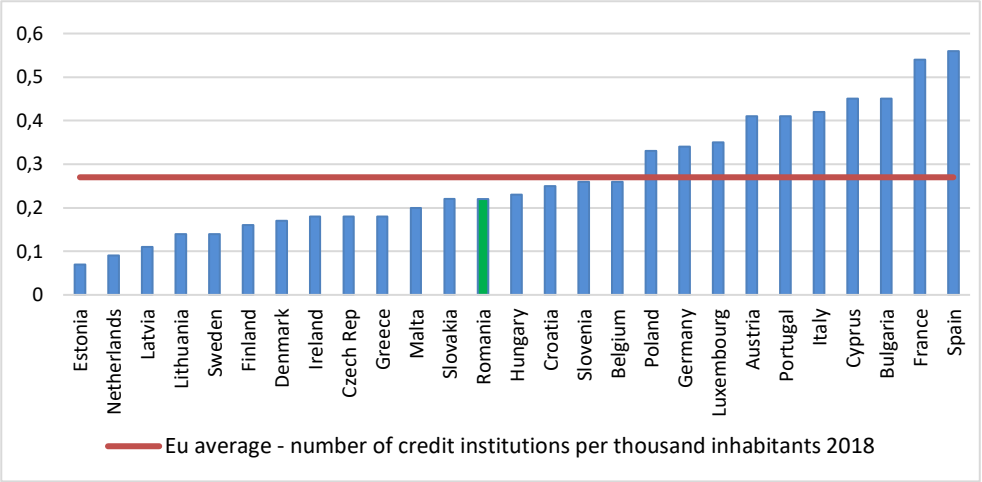


Figure 2. Number of credit institutions per thousand inhabitants, 2018
Source: calculations based on data taken from the European Central Bank https://sdw.ecb.europa.eu and https://ec.europa.eu/eurostat

In the period 2013-2018, HHI calculated for credit institutions registered significant variations (over 500 units) only in the case of Finland and Cyprus, for the rest of the states registering small variations, according to the following chart.

For Romania, the value of HHI in the period 2013-2017 remained below 1000, without major variations, registering a slight increase, from 821 in 2013 to 909 units in 2018, which shows a low concentration in this sector.

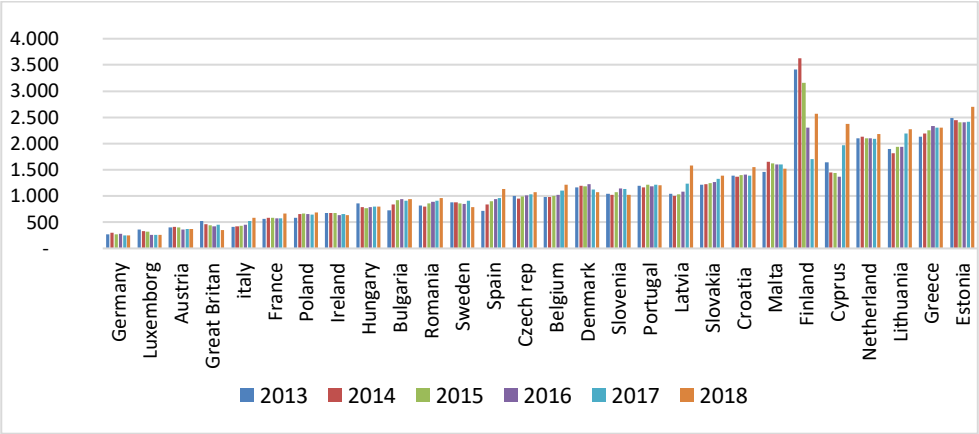


Figure 3. Evolution of the Herfindahl - Hirschman Index for credit institutions (based on total assets), 2013-2018.
Source: calculations based on data taken from the European Central Bank

As the chart below shows, the value of HHI in the case of Romania remains below the European average.

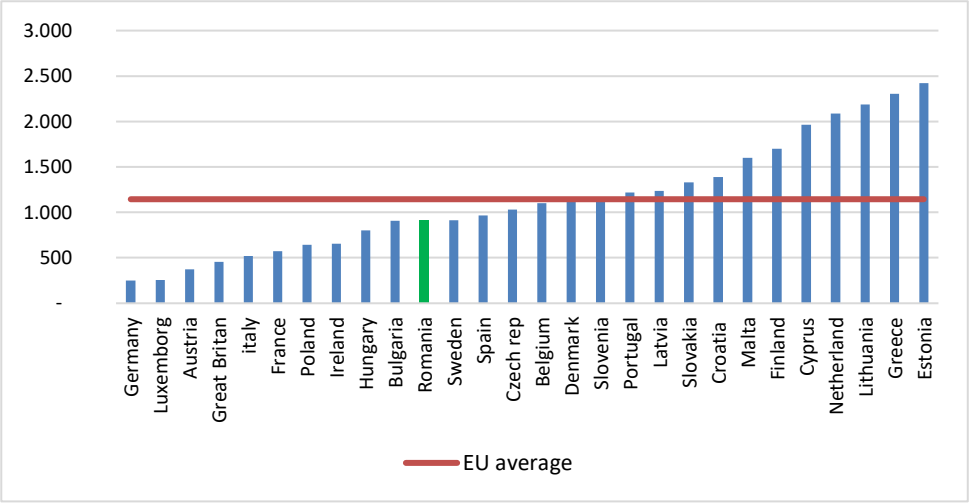


Figure 4. Herfindahl - Hirschman index for credit institutions (based on total assets), European average, 2018.

Source: calculations based on data taken from the European Central Bank

Also, in the case of the CR5 indicator presented in the following chart, Romania is below the European average in 2018, confirming that the level of concentration in the Romanian banking sector is lower than the European average.

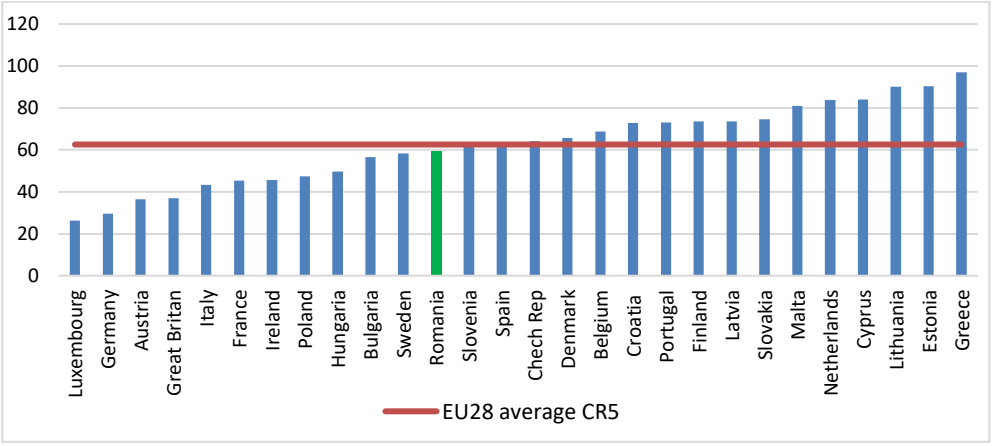


Figure 5. Total assets percentage of the 5 largest credit institutions (CR5), 2018

Source: calculations based on data taken from the European Central Bank

In this context, it can be concluded that the Romanian banking sector is a competitive sector and there is room for further consolidation.

3.2. The Cement Sector

Currently, the Romanian cement market is characterized by an oligopoly structure, the main cement producers present on the Romanian market being the groups: HeidelbergCement Romania SA, CRH Cement (Romania SA) and Holcim Romania SA - members of CIS (Cement Sustainability Initiative).

All cement production plants in Romania were built before 1990, with fully Romanian capital and are currently owned by the three main cement producers. Besides, there are Cemrom SA and Ceminter International SA on the cement market that do not have factories, but other types of installations.

Thus, Cemrom entered the market in 2010 and owns an ecological grinding station in Corbu, Constanța County. The company carries out cement production and marketing activities. Ceminter has owned a loading and a homogenization installation in the Port of Constanța since 2008.

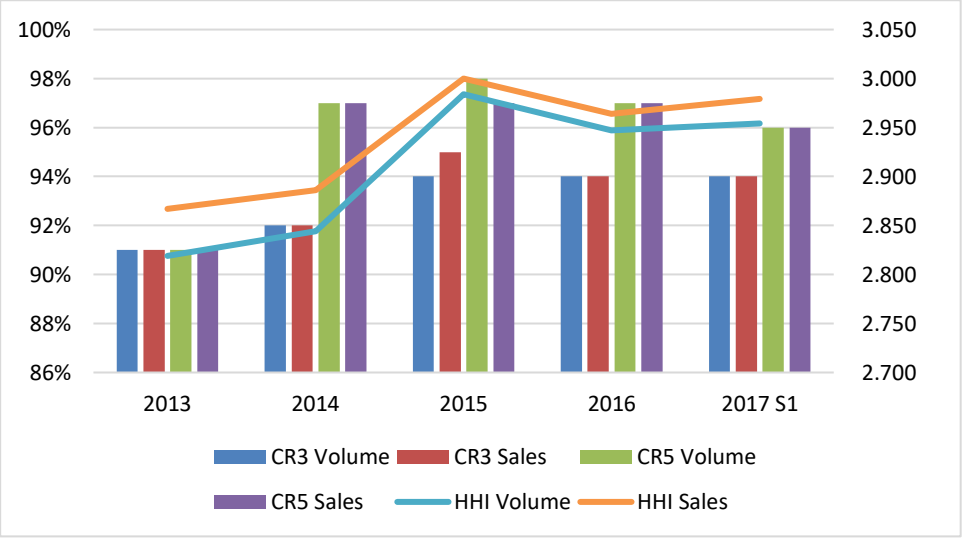
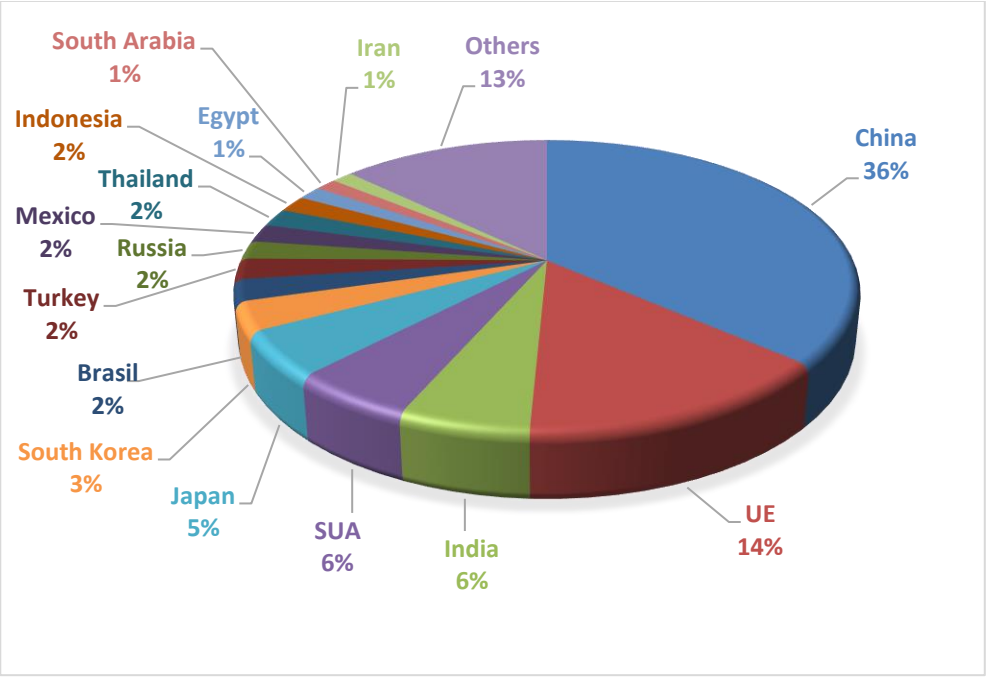


Figure 6. Evolution of concentration indicators for the cement production and marketing sector.
(HHI - represented on the right axis and CR3 and CR5 represented on the left axis)

Source: Preliminary report on the cement sector 2018, Competition Council

The structural situation of the cement production sector is mostly due to the infrastructure available to these companies, which are vertically integrated. Given the considerable barriers to entry, as identified in the Preliminary Report for the Cement Sector, 2018, the Competition Council estimates that no entries will take place in the near future, and the three main cement producers will not be removed from the first positions.

In terms of share in global production, cement production in the EU28 has fallen sharply in the last 16 years, so in 2016 it accounted for only 4.1%, compared to 14.4% in 2000. The decline was caused by reduced demand at the EU level and by expanding production in China and demand in developing countries outside Europe.



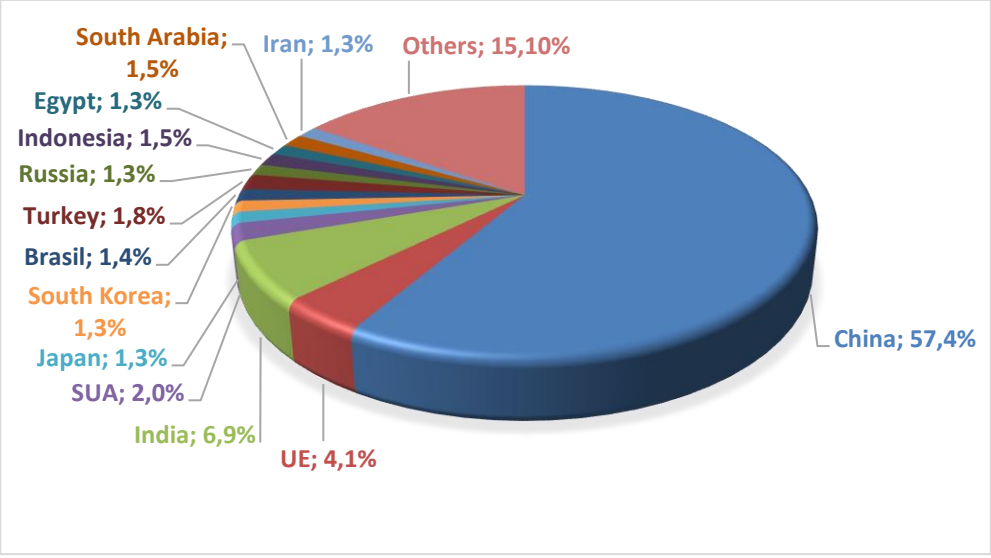


Figure 7. Structure of global cement production in 2018
Source: Preliminary report on the cement sector 2018, Competition Council

The echelon of the top 20 cement producers in the world cumulatively achieves about 75% of the global cement production. This tier includes the EU 28, which accounts for less than 4% of global cement production.

In conclusion, the information presented confirms that an oligopoly structure characterizes the Romanian cement market, having as main producers the groups: Heidelberg Cement Romania SA, CRH Cement (Romania SA), and Holcim Romania SA - members of the CIS (Cement Sustainability Initiative).

3.3. Fuel distribution market

The fuel industry in the European Union continues to be dominated by large multinational, integrated, and often multifunctional companies, which are active at all stages of fuel production (extraction, processing/refining, and distribution).

This sector's main characteristics in Romania do not differ significantly from the rest of the European countries, its structure being, in general, oligopoly. Specifically, most of the supply on this market is concentrated in the portfolio of a small number of oil companies (OMV-Petrom, Lukoil, Rompetrol, MOL, Gazprom, SOCAR). Several vertically integrated companies in this market have lower financial resources than the first category, which manages one / more fuel distribution stations.

Similar fuel market structures are found in most European countries, such as Bulgaria, Poland, Germany, or Greece. For example, for Romania in 2016, OMV Petrom Marketing, Rompetrol Downstream, Lukoil Romania, and MOL Romania Petroleum Products - the companies operating the Petrom, Rompetrol, Lukoil, and MOL gas station networks - jointly owned 80% of the local 40 billion lei market (8.8 billion euros). The four had in 2016 a turnover of 32.7 billion lei.

The market concentration is explained by the fact that three of the four at the top have their own refineries, where they produce fuels that then end up in trade. Therefore, the fuel market is also characterized in Romania's case by a small number of vertically integrated actors, an organization that generates barriers to market entry.

Compared to European countries, in 2017, Romania had a lower degree of concentration in terms of density of fuel stations per square kilometre and per thousand inhabitants.

In terms of these indicators, Romania is close to France, Poland, Germany, and Hungary, at the opposite end being Greece and Italy with significantly higher values.

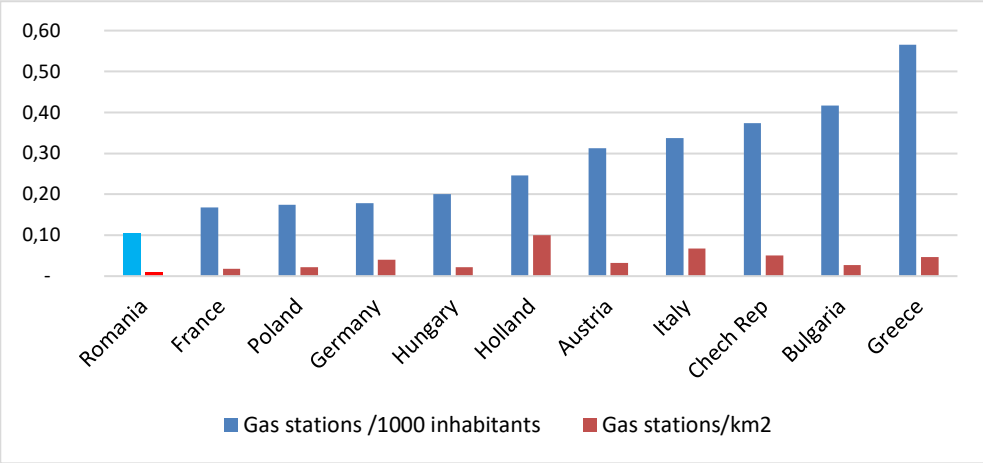


Figure 8. Gas station density, 2018
Source: https://europa.eu; National Oil Industry Associations, DG Energy

In conclusion, the Romanian fuel market is within the European average. In Romania, too, the fuel market is characterized by a small number of vertically integrated actors, an organization that generates barriers to market entry. However, compared to European countries, in 2017, Romania had a lower degree of concentration in terms of density of fuel stations per square kilometre, as well as per thousand inhabitants.

4. Conclusions

As a result of the current assessment, Romania's level of competition is relatively high in terms of the structure of the most important sectors of the economy, with more operators and lower concentration than the European average. However, these markets are in continuous development, with penetration and population coverage rates in progress to fill in the gaps with the other countries' rates.

Concentration indicators in the banking sector show a low concentration of Romania's banking assets, lower than the EU average specific values. The value of HHI in the case of Romania remains below average. In this context, it can be concluded that the Romanian banking sector has the characteristics of a competitive sector.

Regarding the cement Industry, the information presented confirms that an oligopoly structure characterizes the Romanian cement sector, having as main producers the groups: Heidelberg Cement Romania SA, CRH Cement (Romania SA), and Holcim Romania SA - members of CSI (Cement Sustainability Initiative). Under the conditions of some considerable barriers to entry, it is estimated that no entry will take place soon, and the three leading producers of the cement industry will not be removed from the first positions.

The retail fuel sector in Romania is within the European average. In our country, too, the fuel sector is characterized by a small number of vertically integrated actors. However, compared to European countries, in 2017, Romania had a lower degree of concentration in terms of density of fuel distribution stations per square kilometre, as well as per thousand inhabitants.

Thus, based on the available information on the sectors under consideration, they rank as a level of concentration below the European averages corresponding to those sectors. Simultaneously, there is a low level of penetration - share in GDP, which may be a consequence of the level of the population income, which in Romania could vary from the European average.

The contribution of the paper to the field of sector concentration and sustainable development endeavours to support academics, decision-makers, and practitioners in the field, by offering empirical evidence to support enhancing strategies for the researched sectors, and suggesting further comparative studies at European level for countries with similar conditions, in addition to the analysis carried out for Romania.

Acknowledgment

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References

[1] Agoston, S., & Dima, A. M. (2012). Trends and strategies within the process of academic internationalization. *Management & Marketing*, 7(1), 43.

[2] Anderson, R. W., & Johnson, R. N. (1999). Antitrust and sales-below-cost laws: The case of retail gasoline. *Review of Industrial Organization*, 14(3), pp. 189-204.

[3] Azar, J., Marinescu, I., & Steinbaum, M. (2020). Labour market concentration. *Journal of Human Resources*, 1218-9914R1.

[4] Bain, J. S. (1951). Relation of profit rate to industry concentration: American manufacturing, 1936-1940. *Quarterly Journal of Economics*, 65(3), pp. 293-324.

[5] Bikker, J. A., & Haaf, K. (2002). Measures of competition and concentration in the banking industry: a review of the literature. *Economic & Financial Modelling*, 9(2), pp. 53-98.

[6] Busu, M. (2012). An economic analysis on the degree of market concentration: Competition Indicators. In Proceedings of the 6th International Management Conference *Approaches in organizational Management*, Bucharest, pp. 529-537.

[7] Busu, M., Clodnițchi, R., & Mureșan, M. L. (2019). A correlation analysis of the spot market prices of the Romanian electricity sector. *Management & Marketing. Challenges for the Knowledge Society*, 14(1), pp. 150-162.

[8] Busu, M., Vargas, M. V., & Gherasim, I. A. (2020). An analysis of the economic performances of the retail companies in Romania. *Management & Marketing. Challenges for the Knowledge Society*, 15(1), pp. 125-133.

[9] Deopale, C. C., & Ghiculescu, L. D. (2019). Aspects Concerning The Requirements of Environmental Impact. In Cement Industry From Romania. *Nonconventional Technologies Review/Revista de Tehnologii Neconventionale*, 23(4).
[10] Edlin, A. S., & Emch, E. R. (1999). The welfare losses from price-matching policies. *The Journal of Industrial Economics*, 47(2), pp. 145-167.
[11] European Union Competition policy. (2020). Available at https://www.europarl. europa.eu/factsheets/en/sheet/82/competition-policy, accessed 2020.08.29.
[12] Fedorko, I., Bacik, R., & Gavurova, B. (2018). Technology acceptance model in e-commerce segment. *Management & Marketing. Challenges for the Knowledge Society*, 13(4), 1242-1256.
[13] Fonseca, L. M., Domingues, J. P., & Dima, A. M. (2020). Mapping the Sustainable Development Goals Relationships. *Sustainability*, 12, 3359.
[14] Mason, E. S. (1939). Price and production policies of large-scale enterprise. *The American Economic Review*, 29(1), pp. 61-74.
[15] Nica, E., Sima, V., Gheorghe, I, Drugau-Constantin, A., & Mirica (Dumitrescu), C. A. (2018). Analysis of Regional Disparities in Romania from an Entrepreneurial Perspective. *Sustainability*, 10, 3450.
[16] Păunescu, C., Popescu, M. C., & Blid, L. (2018). Business impact analysis for business continuity: Evidence from Romanian enterprises on critical functions. *Management & Marketing. Challenges for the Knowledge Society*, 13(3), pp. 1035-1050.
[17] Pjanić, M., Vuković, B., & Mijić, K. (2018). Analysis of the market concentration of agricultural enterprises in AP Vojvodina. *Strategic Management*, 23(4), pp. 40-45.
[18] Porter, M. (1998). Competitive Strategy. New York: Free Press.
[19] Rhoades, S. A. (1983). Concentration of world banking and the role of US banks among the 100 largest, 1956-1980. *Journal of Banking & Finance*, 7(3), pp. 427-437.
[20] Semenescu, A., & Curmei, C. V. (2015). Using CSR to mitigate information asymmetry in the banking sector. *Management & Marketing. Challenges for the Knowledge Society*, 10(4), pp. 316-329.
[21] Salaman, G., & Storey, J. (2005). Achieving 'fit': Managers' theories of how to manage innovation. In G. Salaman, J. Storey, & J. Billsberry (Eds.), *Strategic human resource management. Theory and practice. A reader*, 2nd ed., pp. 91-115, Thousand Oaks, CA: Sage.
[22] Sidak, J. G. (2006). A consumer-welfare approach to network neutrality regulation of the Internet. *Journal of Competition Law & Economics*, 2(3), pp. 349-474.
[23] Transforming our World: The 2020 Agenda for Sustainable Development; United Nations General Assembly: New York, NY, USA, 2015.
[24] Ze, Y., Abbas, H., Hussain, T., & Jiao, H. (2018). Analysing the differentiation strategies of big companies competing with each other. *Strategic Management*, 23(3), pp. 25-37.

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Perspectives of Online Education in the Context of the COVID-19 Pandemic Crisis

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Abstract

The COVID-19 pandemic forced the digitalization of many sectors, especially of the educational sector starting with March 2020. Along with the fight for health security and the government measures such as self-quarantine and social distancing, destined to reduce the number of COVID-19 infections, the educational sector was forced to adapt in a matter of days to full online teaching worldwide. This has brought numerous challenges in terms of digital skills for the educational facilities personnel and learners, as well as of adapting to new ways of teaching, respectively learning. The present paper intends to analyse if the measure of closing educational facilities in the European Union at different dates in March 2020 could be a factor for reducing the numbers of COVID-19 cases in May 2020. Secondly, we tested if there is a relationship between the digital skills of individuals in percentage and share of persons taking at least one online course in 2019.

The results of the study indicated a contribution of the closure of educational facilities in reducing the number of COVID-19 cases, as well as a relationship between the digital skills of the population and the share of persons taking at least one online course in 2019 before the pandemics started. The study is one of the first regarding the measures for COVID-19 and the educational field, offering a basis for future research in the field as more measures are expected to be applied in the upcoming year.

Keywords: Online education, face-to-face learning, COVID-19, correlation, digitalization.

JEL Classification: I25, O3

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1. Introduction

The online education sector has known a continuous increase in the past decade with technology development, more competition in the business field and the need for IT skills and competences of the population. Furthermore, the COVID-19 pandemic which started in 2019 (World Health Organization, 2020), imposed new strategies for living, education, work stimulating jobs from home, online education, online purchasing and online activities in general where possible (European Commission, 2020). The year 2019, as well as the beginning of the current year were defined by security measures for population's health and strict measures of social distancing and of avoiding physical contact where possible, especially by staying home, working from home, educating from home, purchasing from home, online medical consults and other online activities.

The trend of developing online education started already in the '80s when the modern Internet was created, although other forms of remote education, such as through correspondence were available long before this period (TheBestSchools, 2019) ever since more educational institutions, including the ones offering tertiary education, started to offer online courses. According to Statista (2020a) 49% of the global students followed an online course in 2015 comparing to 46% in 2013. The evolution of the e-learning market encountered also a major development between 2013-2016, especially in the field of packaged content with a market size of 33063 million US Dollars in 2016, followed by platforms with a market size of 7121 million US Dollars (Statista, 2020b). Other e-learning services include learning management systems. The Europe 2020 strategy's target is that at least 40% of 30-34-year-old people in the 27 Member States of the European Union (EU) have graduated from tertiary education by 2020, this target being exceeded in 2019 with a level of 40.3% in the European Union (Eurostat, 2020a). The e-learning market also brought a significant income globally, namely 40.67 billion US Dollars in 2019, however being in a decreasing trend (Statista, 2020c). Globally, the USA represents the region with the highest degree of online education, with 6 million students in 2011 following at least one online course, while the next positions are occupied by India, China and South Korea (ICEF Monitor, 2012).

In 2019-2020 two phenomena in the educational systems have been observed, namely the closure of many educational facilities in March 2020 in the European Union in the context of the COVID-19 pandemic and the fact that online education has started to occupy an important percentage in terms of the people attending at least one online course in 2019. The COVID-19 pandemic has changed more elements of learning and has affected also the phenomena of educational tourism, where individuals travelled across borders to gain knowledge or learn (Harazneh et al., 2018). However, the pandemic has favoured the organizational learning (Bratianu et al., 2020) in terms of adapting individuals to the environmental conditions.

The objective of the present paper was to analyse if the closure of the educational facilities in the European Union in the context of the pandemic was indeed an efficient method influencing the increase in the number of infections

per million persons and the online education trend in 2019. Secondly, the digitalization of learning, namely the share of persons attending at least one online course in 2019 before the pandemics and the digital skills of the population were correlated. This was intended in order to reveal that the online learning development began along with the digitalization and was only expanded by the measures of educational facilities closure and social distancing of COVID-19.

2. Literature review

2.1. Evolution of online education

Online education practically started in the 80's when the modern Internet was created. The first higher education institution that offered an online study programme was Western Behavioural Sciences Institute, School of Management and Strategic Studies in 1981 and in 1985 the first accredited online higher education programme was offered by Nova Southeastern University (TheBestSchools.org, 2019). The 90's represented the Era of Information and Internet Boom. This implied the possibility of expanding online higher education programmes and the development of learning management systems. Given the economic context of that time, companies started to use the Internet for research, promotion and innovation.

This technological boom was marked by inflation and an Internet bubble. In 1991 the World Wide Web was presented and offered to the public. This offered to the public the possibility of online learning in the version that is known nowadays. In 1992 the Electronic University Network presented an offer of a PhD programme through America online and in 1994 Calcampus offered the first online courses in a higher education programme with real-time teaching and participation, respectively synchronized learning. Jones International University was the first accredited higher education institution in 1996 that offered only online learning and in 1998 the creation of Google further expanded the possibilities of online learning. The 2000's until present were considered the Era of Information-Global Community. In this period distanced households and communities were linked through Internet, while legislations were updated to support the dynamics of knowledge and information through the usage of Internet. Online formats are introduced in the business field, and having a website and a digital profile on social media, online certifications for learning and other such online activities became usual. In 2009 more than 5.5 million students were registered globally for at least one online course of higher education. Regarding some of the countries with the highest degree of online education US occupied the first place, as in 2011 6 million students in America attended at least one online course (ICEF Monitor, 2012). India, China, South Korea held the next positions and in the European Union the UK developed the online learning system with investments of over 100 million British Pounds in 2011.

Currently there is also a Digital Education Action Plan that was introduced by the European Commission in order to offer measures supporting digitalization of educational systems and help European Union states meet challenges and opportunities in the era of digitalization. The Digital Education Action Plan focuses

on eleven fields of measures used to support digital education, namely the first three actions are dedicated to making better use of digital technology for teaching and learning, the next four actions for developing digital competences and skills and the last three actions for improving education through better data analysis and foresight:

Action 1 - Connectivity in Schools
Action 2 - SELFIE self-reflection tool & mentoring scheme for schools
Action 3 - Digitally Signed Qualifications
Action 4 - Higher Education Hub
Action 5 - Open Science Skills
Action 6 - EU Code Week in schools
Action 7 – Cyber-security in education
Action 8 - Training in digital and entrepreneurial skills for girls
Action 9 - Studies on ICT in education
Action 10 - Artificial Intelligence and analytics
Action 11 - Strategic foresight (EC, 2020).

Since 2019 and until present nowadays, given the globalization phenomena, technology development and especially the COVID-19 pandemic of the last year online education has become a necessity at least in terms of combining it with face-to-face education, if not exclusively offering online courses. Blended learning platforms that were complementary to the face-to-face classes were developed or improved within higher education institutions through the availability of digital study materials and tools, as well as educational tools for evaluating students. They also fully digitalized even some subjects from numerous Universities and departments. The COVID-19 crisis has emphasized the importance of online education used in order to ensure continuity for teaching students, pupils, adults and other categories of participants under health safety conditions.

2.2. Policies of countries for closing educational facilities in the context of the COVID-19 pandemic

The COVID-19 pandemic represented a challenge for higher-education institutions, as well as other types of educational facilities that were required to delay face-to-face classes by March 2020 until the end of the semester or until further notice (Volpe and Crosier, 2020). The institutions had to find a rapid solution to continue the teaching for the students and to ensure the activities of their employees and this was possible through the implementation of online learning as the main alternative to face-to-face education, as well as through online activities of other types for non-educational staff. In March 2020 all countries of the European Union closed their educational facilities due to health risks under circumstances of the COVID-19 expansion in order to limit the pandemic and deaths resulting from it (COVID-19 Healthdata, 2020). Another issue besides that one was represented by the recommendations of the European Union to keep educational facilities closed at least by the end of May 2020 if not until September 2020 or until further notice. This could have jeopardized the continuity of learning for students and the activity

of the personnel of educational institutions. Online learning ensured the continuity of both perspectives in the current context of necessity for social distancing due to the COVID-19 pandemic. However, many learners suffered a form of digital inequality whereby they lack the connections and devices to learn remotely (EPALE, 2020). Figure 1 illustrates the cases of COVID-19 infections in the European Union starting with the 1st of March 2020, when educational facilities started to close until June 2020.

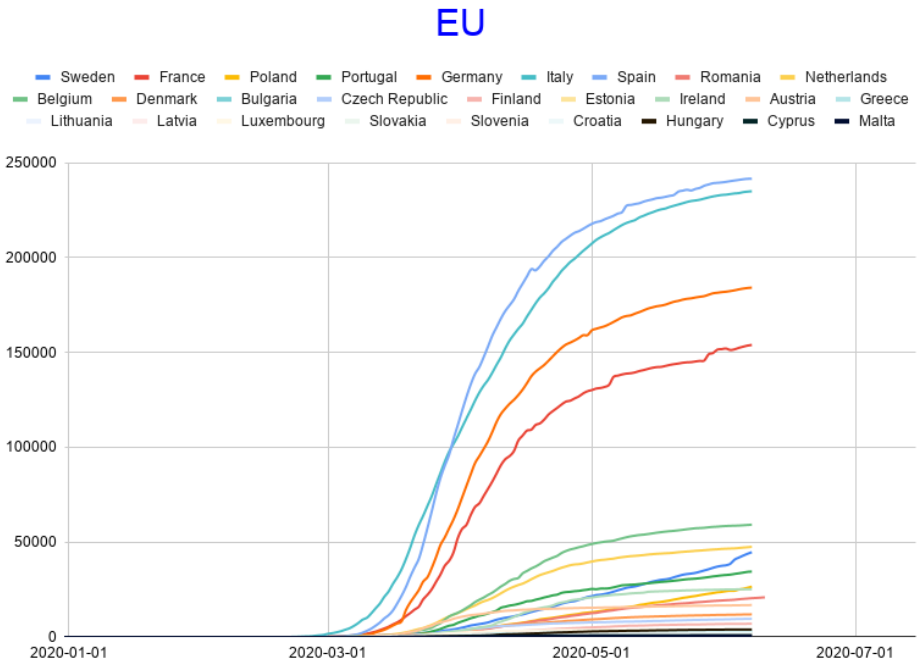

Figure 1. Cases of COVID-19 in the European Union from March 2020-June 2020
Source: Worldometers.info (2020) and COVID-19 Healthdata (2020)

According to the paper of ETUCE (2020) the Eurydice research network mentioned the periods until some countries of the European Union have to keep the educational facilities closed, namely:

Germany and Switzerland: Terms are different in school closures across the country.

Luxembourg: upper secondary schools (ISCED 3) will open on May 4th for students in their final year.

Austria: upper secondary schools will open on May 4th 2020 for students in the last school year who need to take the national exam (Matura).

Czechia: Tertiary education institutions may operate from 20 April 2020 only for individual consultations and examinations.

Norway: Higher education institutions are opening from April 27, 2020 for students that are at the end of their degree studies, and who are dependent upon using equipment at the university.

The closure of educational facilities starting with March 2020, as well as the closure of numerous other face-to-face activities from different sectors led to the increase of stock price of online platform companies, especially for Zoom Video Communications which skyrocketed in early 2020, amounting to over 150 U.S. dollars on March 23rd (Statista, 2020d). As the need for social distancing was imposed in order to protect citizens' health from the COVID-19 pandemic, the demand for remote solutions like Zoom also increased in several fields and especially in the educational sector in order to ensure continuity of the activity. This contributed to the strong performance of Zoom's shares. Numerous companies and educational facilities used Zoom as a main platform to communicate and perform several activities online during the COVID-19 pandemic.

SWOT analysis online education vs. face-to-face education

The COVID-19 pandemic has also brought to attention advantages and disadvantages of both forms of learning, online and face-to-face, which had to be faced by educational facilities. These were tested also before the pandemic, as online education programmes expanded in many educational facilities, but in 2020, along with the exponential increase of online learning, they have been confirmed by more studies, as shown in the tables below. Both types of education, respectively face-to-face education and online education have their own positive and negative parts and can offer high-quality learning for the students, however, aspects such as schedule flexibility, feedback, socializing possibilities, costs and other such factors make a difference in terms of opting for one form or the other. The COVID-19 crisis forced the majority of educational institutions globally to offer further courses, but only online in order to prevent the pandemic. This e-learning phenomenon has also shown the necessity of improving online learning platforms, the technical and social issues that can arise in the e-learning process and further solutions for improvement.

Face-to-face education offers the advantages of direct socializing and the possibility of creating networks by working directly with different members and stakeholders of the educational institution, as well as the possibility of direct consultancy for students and more learning and support through this during classes, as shown in Table 1. However, there are other less positive parts, such as: it is more time consuming, which can decrease the number of participants, especially in the case of students working. This can impact also negatively the income of educational institutions if they charge taxes from students or if they receive financing based on the number of students they teach.

Table 1. SWOT analysis of face-to-face education

Strengths Students, parents, educational institution employees can interact directly for problem solving. Teachers/professors can better supervise students at evaluations/exams and also adapt the teaching process during classes to focus students' interest on the topic. Rapid consultancy for students' questions directly. Efficient socializing and communication of students, teachers/professors and other parties Feeling of belonging to a community Networking Teaching hours are done strictly in classrooms and this can stimulate the ''necessity'' of students to participate physically to a certain number of classes with their classmates Students can compare written information	***Weaknesses*** Courses/seminars/classes materials are usually not available on an online platform where all students have access to Increased stress for some participants due to being in a room full of people. For students with jobs or family issues, etc. not attending more classes can be demotivating for participating in further classes in the future for this subject/for further participating in general. Teachers/professors cannot answer all students' questions in some cases. Time consuming, such as with the transport to the educational institution, which can affect negatively the number of participants (especially students working, etc.) and income of the educational institution. Face-to-face education costs are higher, such as transport costs to the education institutions.
Opportunities Partnerships on a national and international level with other universities, educational institutions, etc. Increased demand for employment on certain fields, especially in the financial, sales/procurement, IT, engineering, which offers the basis for creating courses. Expansion of subvention programmes for Universities. Expansion and accessing European and international financing for research projects, equipment of classrooms, Universities' or educational institutions' expansion, renovating the institutions' building, etc. Development of technologies.	***Risks*** Competition from other educational institutions. Hostilities. Terrorism. Pandemics, such as COVID-19. Increased demand for online courses Political instability and political decisions affecting the educational field.

Source: Hande, 2014, Guma et al., 2019, Volpe and Crosier, 2020, Authors' own research (2020)

On the other hand, online education offers materials online, allowing accessibility to these education sources everywhere with the condition of Wi-Fi access and more comfort in terms of participants being in any space they want or need to, which can reduce this type of stress, as shown in Table 2. However, the access to online education can be restricted or limited based on financial reasons in more regions, where there is poverty or no or limited subventions for purchasing computers, laptops or devices for participating in e-learning.

Table 2. SWOT analysis of online education

Strengths	***Weaknesses***
Accessibility of students to online materials and innovative teaching methods. Teaching a high number of students in a short time is possible. Interaction possibility between students and teachers/professors online and also physically in classrooms if a combination of face-to-face and online education methods are offered. Learning IT skills for teachers/ professors and students. Independent learning for students is possible. Possibility of a quick feedback online. Accessibility in any region and work from home is possible as long as there is Wi-Fi/Internet. Support from external specialists for administrating and maintaining the online platform. Participants in online learning can be in a comfortable space, which reduced this type of stress.	Technical issues due to lack of Internet connection/poor connection. Lack/reduced possibility of supervising the real activity of students online during classes (regarding their real-time focus on the discussed topics). Distractions for participants, especially for students (such as games on Internet, eating, etc.) instead of focusing on the discussed topic. Lack of funds for many institutions for purchasing computers, laptops for some educational institutions and/or students. Increased stress for students when assignments with a limited time are given. Resistance change from institutions and students (in some regions, etc.). Limited skills in using online platforms for some participants (teachers/professors/instructors, students, etc.). Costs for the training of personnel of the educational institutions in order to use online learning platforms (depending on the necessities). Incompatibility of the online software with hardware and software parts. Lack of a stable and complete regulation regarding online learning policies (for some institutions). Tendency to socialize less in some cases (for students, teachers, professors and other participants). Integrity issues with online testing. A feeling of isolation for participants sometimes.

Opportunities	***Risks***
Development in the technological field, new innovations for online learning solutions Increased demand for online learning and online learning platform services National and international partnerships with other educational institutions Development of user-friendly, online platforms COVID-19 pandemic imposed online learning for many educational institutions stimulating this field.	Increased costs of new technologies, that need to be updated for online learning. Competition with other educational institutions. War.

Source: Hande, 2014, Guma et al., 2019, Volpe and Crosier, 2020, Authors' own research (2020)

3. Aims of the research and research methods

As the data for online education in the context of the COVID-19 pandemic is still under development, we focused on the information available for the European Union States between March 2020 and May 2020. In March 2020 the educational facilities in the European Union states were closed at different times when there was already a certain number of COVID-19 pandemic cases, which imposed a rapid response in this field in order to ensure the health safety of their members whether personnel or students.

Firstly, we used the Pearson coefficient to analyse if there was a correlation between the number of cases of COVID-19 infections per million persons when educational facilities closed in March 2020 and the number of COVID-19 infections per million persons currently, namely on the 23rd of May 2020. Then we calculated a correlation between the digital skills of individuals and the number of persons taking at least one online course in 2019. The formula for the Pearson coefficient is:

$$\text{Pearson coefficient}=\frac{\mathrm{E}[(\mathrm{X}-\mathrm{E}(\mathrm{X}))(\mathrm{Y}-\mathrm{E}(\mathrm{Y}))]}{\sqrt{\mathrm{VAR}(\mathrm{X})\mathrm{VAR}(\mathrm{Y})}}$$ (Meissner, 2014).

The value of the coefficient of correlation always lies between +1 and -1, respectively:

r=+1, perfect positive correlation

r=-1, perfect negative correlation

r=0, no correlation.

Depending on the value of the Pearson coefficient the strength of the correlation can be interpreted as follows (Evans, 1996):

0.00-0.19 "no correlation-0 to very weak", 0.20-0.39 "weak", 0.40-0.59 "moderate", 0.60-0.79 "strong", 0.80-1.0 "very strong".

4. Findings

4.1 Educational facilities closure in the context of the COVID-19 pandemic

Firstly, we tested if there is a correlation between the number of cases of COVID-19 infections per million persons when educational facilities closed in March 2020 and the number of COVID-19 infections per million persons currently, namely on the 23rd of May 2020. We correlated the numbers of days since the educational facilities were already closed on the 23rd of May and the growth multiplier of the number of cases of Covid-19 infections per million users during the period in which the educational facilities were closed. We found a non-significant (p-value of 0.1974) correlation of 0.25. The R-squared, which is the proportion of variance in one variable explained by the other variable is low (0.0656) as well. Another approach would be to correlate between the number of cases of COVID-19 infections per million persons when educational facilities closed in March 2020 and the number of COVID-19 infections per million persons currently, namely on the 23rd of May 2020. For this correlation we found a higher value of 0.41, still significant (p- value of 0.0336 for the t-test) which implies that the higher the infections degree with COVID-19 at the moment of closure of educational facilities the higher the degree also on the 23rd May 2020. The R-Squared value is 0.16 and this correlation is basically the same correlation as the first one, but in this case we do not include directly the time component. Table 3 presents the number of COVID-19 infections per million persons on the date of closure of educational facilities and the number of infections per million persons currently (23rd of May 2020).

Table 3. Number of COVID-19 infections per million persons at the date of closure of educational facilities and the number of infections per million persons currently (23rd of May 2020)

Country	Closing date of educational facilities	Number of days closed until 23-May-2020	Covid-19 infected persons/million persons at closing date of educational facilities	Total/million of Covid-19 infected persons on 23-May-2020	Growth Multiplier of Covid-19 infected persons during this period
Italy	04/03/2020	81	51.08	3792.36	74.2
Romania	11/03/2020	74	2.42	930.96	384.5
Greece	11/03/2020	74	9.49	275.79	29.1
Slovakia	12/03/2020	73	3.85	276.41	71.9
Norway	12/03/2020	73	147.69	1540.76	10.4

Country	Closing date of educational facilities	Number of days closed until 23-May-2020	Covid-19 infected persons/million persons at closing date of educational facilities	Total/million of Covid-19 infected persons on 23-May-2020	Growth Multiplier of Covid-19 infected persons during this period
Latvia	12/03/2020	73	8.47	554.50	65.4
Ireland	12/03/2020	73	14.19	4984.28	351.2
Malta	13/03/2020	72	27.18	1381.89	50.8
France	13/03/2020	72	56.10	2796.08	49.8
Cyprus	13/03/2020	72	11.97	792.31	66.2
Bulgaria	13/03/2020	72	4.46	349.03	78.3
Spain	14/03/2020	71	136.70	6039.62	44.2
Belgium	14/03/2020	71	59.48	4928.34	82.9
Netherlands	15/03/2020	70	66.25	2630.55	39.7
Slovenia	16/03/2020	69	121.70	706.14	5.8
Portugal	16/03/2020	69	32.20	2964.11	92.1
Poland	16/03/2020	69	4.68	561.05	120.0
Luxembourg	16/03/2020	69	129.63	6385.40	49.3
Lithuania	16/03/2020	69	6.60	1463.77	221.7
Hungary	16/03/2020	69	4.04	387.16	95.9
Estonia	16/03/2020	69	154.55	1374.35	8.9
Denmark	16/03/2020	69	157.86	1949.70	12.4
Croatia	16/03/2020	69	13.88	546.04	39.4
Austria	16/03/2020	69	113.10	1833.45	16.2
Germany	18/03/2020	67	147.18	2148.92	14.6
Finland	18/03/2020	67	27.98	1187.58	42.4
United Kingdom	23/03/2020	62	99.77	3858.27	38.7

Source: Author's own calculations based on data from Worldometers.info (2020) and COVID-19 Healthdata (2020)

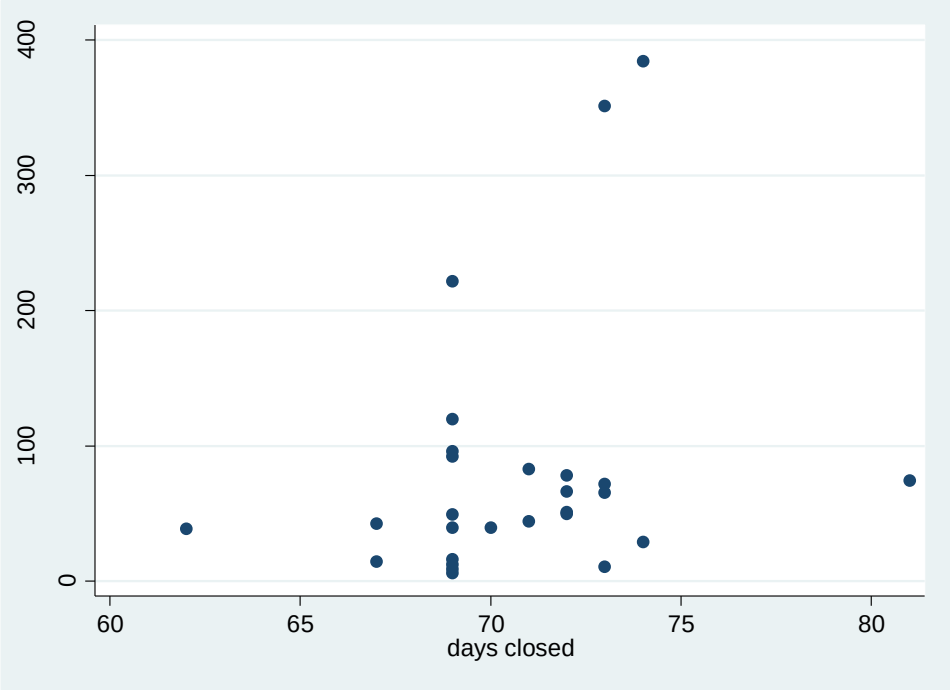

Figure 2. Number of days of closure of education facilities since closure of the educational institutions and the growth multiplier of COVID-19 until May 23rd 2020 (Scatter plot of data points)

4.2. E-Learning in 2019

Secondly, we focused on discovering whether there is a correlation between the digital skills of individuals in terms of the percentage and share of persons attending at least one online course in 2019. We found a significant correlation coefficient of 0.75, which indicates a strong connection. This implies that populations of countries with high percentages of individuals with basic or above basic overall digital skills tended to take at least one online course comparing to countries with lower percentage of individuals having basic or above basic overall digital skills. The correlation is significant as the significance level is 0. Furthermore, we performed the Shapiro – Wilk test to test for a normal distribution, one of the necessary assumptions of the Pearson correlation (Appendix A). Figure 3 presents two percentages, namely the percentage of the population having individual digital skills as well as the percentage of the population taking at least one online course. Table 4 presents the correlation results and a scatterplot to display the data points, as well as a fitted line (under OLS assumptions). Figure 4 presents a scatterplot of the two variables (including a fitted line under OLS assumptions).

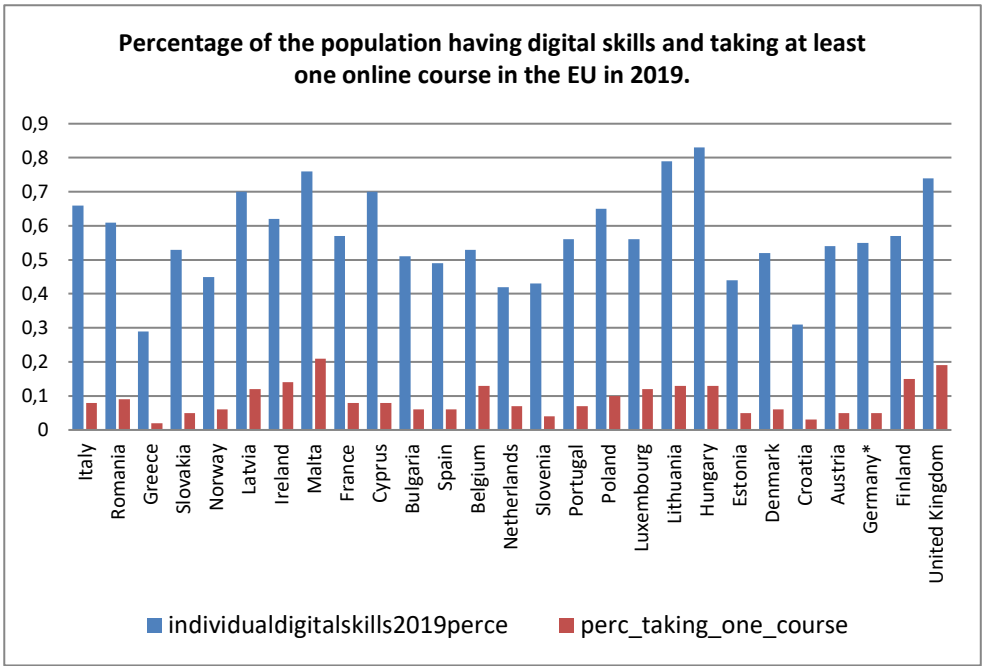

Figure 3. Individuals attending at least one online course and individual digital skills in 2019

Source: Statista (2020d), Authors' own calculations based on Eurostat (2020b)

Table 4. Correlation between percentage of individuals attending at least one online course (perc_t~e) and individual digital skills (indivi~e) in 2019

	perc_t~e	indivi~e
perc_takin~e	1.0000	
individual~e	0.7523 0.0000	1.0000

Source: Statista (2020d), Authors' own calculations based on Eurostat (2020b)

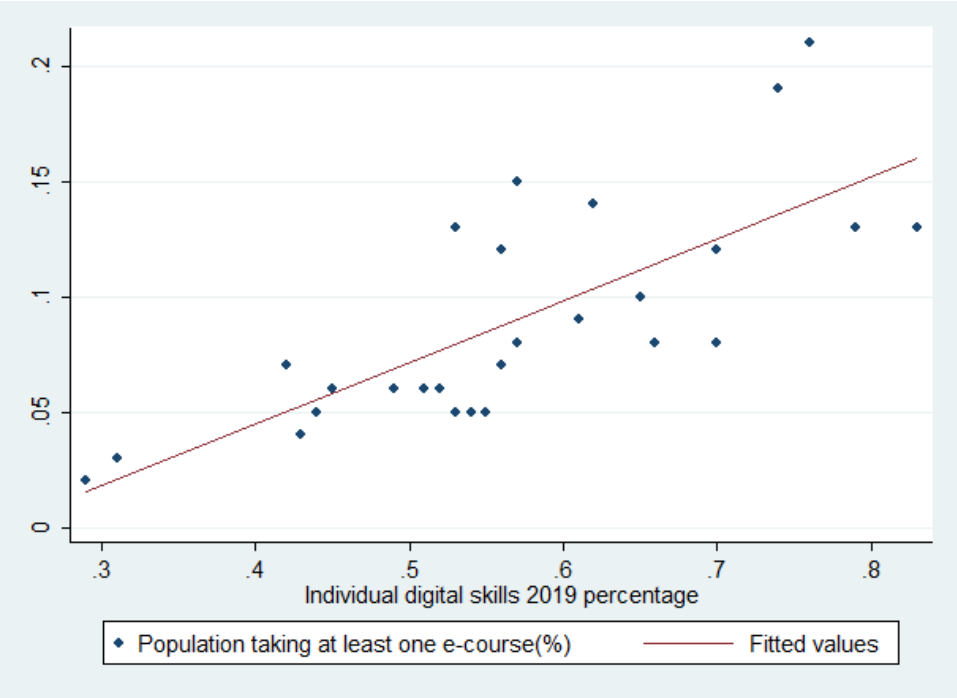

Figure 4. Pierson- results including significance level and a scatterplot of the data points (with an OLS regression line)
Source: Statista (2020d), Authors' own calculations based on Eurostat (2020b)

Limitations of the study refer to the restrictive available data on online learning development during 2020 and to other connected variables.

5. Conclusions

The e-learning market has encountered a significant development in recent years, cumulating 49% of the individuals attending at least one online course in 2015 and bringing a high income from the e-learning market of about 41 billion US Dollars in 2019. The COVID-19 was only an accelerator for the development of online learning and its more dynamic introduction throughout educational systems all over the world. While the digitalization of societies was already in progress in the recent period, the COVID-19 pandemic changed the perspectives of education imposing online learning as a main solution for teaching, as regulations for social distancing for health security imposed this. While it can bring advantages such as the possibility of teaching in real time to numerous students and the possibility of access from any region with connectivity to Internet, online learning also brought challenges in terms of reorganizing the personnel of educational facilities in order to be able to perform online teaching and the costs associated with it, it decreased socialization among participants and other security and supervision issues for the teaching personnel. The new online learning system throughout the world

also imposed quick new regulations to educational facilities in order to support a transparent and efficient teaching process, that can avoid legal issues or complains of any sort from all participants. Thus, although online learning itself is an advantage for most participants, it still brought challenges in legal, social and economic terms for educational facilities, their personnel, students and other stakeholders. Higher educational facilities have been some of the most affected, as they are responsible for ensuring education for more mature learners, but also to contribute to community development through knowledge, innovation and skills for jobs (Paunescu et al., 2018).

This paper explores whether there is a positive relationship between the closure of the educational facilities and the declining numbers of COVID-19 infections from March to May 2020. We do not find a negative relationship and more research will have to be done, for example by comparing multipliers over different periods.

Secondly, regarding the online learning in 2019 we found a significant correlation, implying that populations of countries with high percentages of individuals with basic or above basic overall digital skills tended to attend at least one online course comparing to countries with lower percentage of individuals having basic or above basic overall digital skills. Thus, digitalization of the society in terms of added digital skills and the current context of the COVID-19 pandemic are factors of influence for online education, that are also expected to continue and develop in the next years.

The COVID-19 pandemic context has accelerated the introduction of online learning worldwide through learning platforms, the educational institutions' websites or other e-learning solutions and thus, the restructuring of the concept of learning. However, this phenomenon is also possible and encouraged due to basic and above basic digital skills of the populations from earlier ages, which contributed to a rapid implementation of the online learning.

As the educational facilities are forced due to the current pandemic context to keep the closure of their institutions until September 2020 earliest, if not until further notice, the online learning is already a solution considered for a mid-to long term teaching and learning. Benefits of the online learning are already being noticed, especially in terms of accessibility in any region and work from home for educational personnel and students, rapid feedbacks, more comfort in terms of the personal location of the online platforms' users, such as at home in a familiar environment. However, the online learning also brings some challenges in terms of social distancing and less personal communication through self-isolation, less possibility of supervision of students and financing issues in terms of providing the software or hardware necessary for online learning and/or trainings for personnel and other participants in the process.

A future research objective would be to analyse the effect of the COVID-19 pandemic on online learning platforms demand during March 2020 and until the reopening of educational facilities, as well as the changes in the teaching process after this period worldwide, and whether educational facilities will continue only online, face-to-face or with a mixed structure of services, namely online and

face-to-face. We could find further negative correlations regarding educational facilities closures and COVID-19 and this can be explained by more factors, such as lock-down of business, local or national restriction measures different from one country to another and other factors. The massive open online courses (MOOC) are also an interesting topic for future research in correlation with the COVID-19 pandemic development as more educational facilities will be focused on online.

References

[1] Bratianu, C., Prelipcean, G., and Bejinaru, R. (2020). Exploring the latent variables which support SMEs to become learning organization, *Management & Marketing. Challenges for the Knowledge Society*, 15(2), pp. 154-171. DOI: 10.2478/mmcks-2020-0010.

[2] COVID-19. (2020). *Healthdata.* Retrieved from https://covid19.healthdata.org/austria.

[3] EPALE (2020). *COVID-19 is reviving the need to explore online teaching and learning opportunities.* Retrieved from https://epale.ec.europa.eu/en/blog/covid-19-revivingneed-explore-online-teaching-and-learning-opportunities.

[4] ETUCE (2020). *Eurydice reports on closure and reopening of schools and education institutions across Europe.* Retrieved from https://www.csee-etuce.org/en/policy-issues/covid-19/294-latest-updates/3788-eurydice-reports-on-closure-and-reopening-of-schools-and-education-institutions-across-europe (Accessed April, 2020).

[5] Evans, J. D. (1996). *Straightforward statistics for the behavioural sciences. Pacific Grove*, CA: Brooks/Cole Publishing.

[6] EC (2020). *Digital Education Action Plan (2021-2027).* Retrieved from https:// ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en (Accessed May, 2020).

[7] European Commission (2020). *Online shopping continues to grow.* Retrieved from Eurostat News, Product code: DDN-20200420-2 https://ec.europa.eu/eurostat/.

[8] Eurostat (2020a). *Europe 2020 education indicators in 2019.* Retrieved from https://ec. europa.eu/eurostat/documents/2995521/10749941/3-22042020-BP-EN.pdf/04c88d0b-17af-cf7e-7e78-331a67f3fcd5.

[9] Eurostat (2020b). Retrieved from https://appsso.eurostat.ec.europa.eu/nui/show.do?data set=isoc_sk_dskl_i&lang=en.

[10] Harazneh, I., Al-Taal, R. M., Al-Zyoud, M. F., Abubakar, A. M. (2018). Motivational factors for educational tourism: marketing insights. *Management& Marketing. Challenges for the Knowledge Society,* 13(1), pp. 796-811.

[11] ICEF Monitor (2012). *8 countries leading the way in online education.* Retrieved from https://monitor.icef.com/2012/06/8-countries-leading-the-way-in-online-education/.

[12] Meissner, G. (2014). *Correlation Risk Modeling and Management.* Singapore: John Wiley & Sons.

[13] Paunescu, C., Dragan (Gilmeanu), D., Gauca, O. (2018). Examining obligations to society for QS Stars best ranked universities in social responsibility. *Management & Marketing. Challenges for the Knowledge Society,* 12(4), pp. 551-570.

[14] Statista (2020a). *Share of global students who have taken an online course in the past year from 2013 to 2015.* Retrieved from https://www.statista.com/statistics/548112/ online-course-student-access-worldwide/.

[15] Statista (2020b). *Size of e-learning market in 2013 and 2016, by segment (in million U.S. dollars)*. Retrieved from https://www.statista.com/statistics/501124/worldwide-elearning-market-size/.

[16] Statista (2020c). *Worldwide self-paced e-learning market revenue from 2016 to 2021 (in billion U.S. dollars)*. Retrieved from https://www.statista.com/statistics/684343/global-self-paced-e-learning-industry-revenue/.

[17] Statista (2020d). Retrieved from https://www.statista.com/statistics/1106104/stock-price-zoom/.

[18] TheBestSchools (2019). *History of Online Education.* Retrieved from https://thebestschools.org/magazine/online-education-history/.

[19] Volpe, A. M., Crosier, D. (2020). *Focus on: What has the covid-19 crisis taught us about online teaching?*. Retrieved from https://eacea.ec.europa.eu/national-policies/eurydice/content/focus-what-has-covid-19-crisis-taught-us-about-online-teaching_en.

[20] World Health Organization (2020). *Coronavirus disease 2019 (COVID-19) Situation Report – 94.* Retrieved from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200423-sitrep-94-covid-19.pdf?sfvrsn=b8304bf0_2#:~:text=Retrospective%20investigations%20by%20Chinese%20authorities,%2C%20some%20did%20not.

[21] Worldometers (2020). Retrieved from https://www.worldometers.info/coronavirus/#countries.

Appendix A

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
perc_takin~e	27	0.93144	2.016	1.440	0.07495
individual~e	27	0.98039	0.576	-1.132	0.87116

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Organizational Knowledge Sharing Overview - Early 2020s Assessment

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Abstract

As technology's pace gets faster and faster every day, more "classic" domains started to adopt automation in order to keep up with the increased demand for results from the society. In the last few decades, this type of fast-paced rhythm led to the appearance of a new successful type of organization which is mainly focused on the knowledge rather than being product oriented. These types of organizations are called knowledge intensive organizations and they mostly rely on what is being known as "knowledge workers".

This paper aims to discuss and present how the recent breakthroughs in Artificial Intelligence (mainly GPT-3) can eventually impact even these seemingly "new" organizations, by allowing them to automate the work of the "knowledge workers".

In the second part of the present paper we will discuss and analyse the most prone activities and domains/sectors to be automated in the near future and we will analyse data coming from Eurostat in order to determine how many people are at risk of being replaced by automation if their organizations decide to adopt automation systems in the coming years. Also, we will consider the current global epidemic caused by Covid-19 in order to see if it can influence that decision in any way.

Keywords: Knowledge sharing, knowledge workers, generative artificial intelligence, sharing rationales, global pandemic.

JEL Classification: M100

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1. Introduction

At the beginning of 2020, the total number of bytes in the digital universe was 40 times larger than the number of stars in the observable universe - approx. 44 Zettabytes (Desjardins, 2019). Moreover, by the end of 2020, according to Domo - Data Never Sleeps 6.0 report, it's being estimated that for each person on earth, over 100 Mb of data will be created every minute (Domo, 2018). Adding to this trend, 2020 has also been "forced" into even more digitalization due to the Covid-19 global pandemic and the lock-down restrictions imposed in most developed countries. The result of everything mentioned above is that we are witnessing a "data explosion" in the digital environment as the 2020s started and more is to come by the end of this decade. Two other emerging technologies are going to take the amount of generated data to the next level: 5G and IOT devices (more precisely, the complementary implementation of the two).

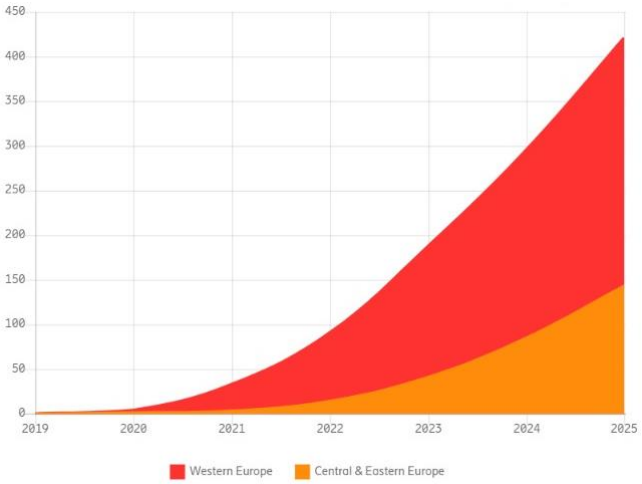

Figure 1. Number of 5G subscriptions in Europe
Source: Ericsson Mobility Visualizer (2020)

As we can see in the data provided by Ericsson Mobility Visualizer (Figure 1), 5G networks are set to take off by the end of 2020 in Europe. This will prepare the stage for the widespread adoption of IOT devices, as the 5G network will be the backbone on which data collection using IOT devices will work and communicate.

2. Problem Statement

Right now, we are witnessing a "perfect storm" consisting of massive amounts of digital data, state-of-the-art programs that allow us to analyse the data, scalable processing power (cloud-based) and a context that "force" a lot of organizations to become even more digitized (the global pandemic). The "data-driven" mindset is being embraced to varying degrees by organizations depending on their industry and field of activity all around the world. However, it's still an act of balance and the risk

of falling into the "big data trap" can have adverse consequences, like blurring the distinctions between knowledge and data (Grover, 2019). The problems that such large amounts of data create for organizations are practical ones, like who can analyse and interpret such enormous quantities of data (will people still be able to do that or will it be mandatory for big organizations to use artificial intelligence/machine learning). Also, there are ethical questions that organizations need to answer, like choosing between implementing an AI system in a certain data processing department or keeping 20 people hired to do the same job (even though the AI system has better perspectives). These are really hard questions to figure out by corporations all over the world, questions the answer of which could have long-term repercussions on the organization well-being (Kuzior et al., 2019).

3. Aims of the research

The purpose of the present paper is to analyse the rate at which data/information is being created and to try to determine whether or not a widespread transition to Artificial Intelligence systems is mandatory in organizations. Also, we will analyse the implications of such a transition for the corporations and their employees, especially in the light of recent events happening worldwide.

When saying "recent events", we are trying to cover two main topics: the prolonged work from home period that was implemented by organizations all over the world for their employees (caused by the global pandemic) and the recent breakthroughs in Artificial Intelligence, mainly OpenAI's new language generator - GPT-3.

Our objectives are focused on determining what activities/domains of work are the "endangered" ones and how many people are at risk of being replaced by automation systems in the near future.

4. Research Methods

In order to achieve the objectives of this paper, we first started by looking into other scientific papers that describe in detail the differences between data, information and knowledge, papers like "*Human-Centred Dissemination of Data, Information and Knowledge in Industry 4.0*" (Li et al., 2019) and *Opportunities of Harnessing Organizational Knowledge* (Bejinaru, 2019).

Once we had a clear image of the data-information-knowledge paradigm we started looking for recent breakthroughs in technology that would allow a computer to process data and information into knowledge (or at least the closest technology ever got to achieving this). Researching for the most up-to-date AI system out there, we found an article in MIT Technology Review magazine, written by W.D. Heaven and called "*OpenAi's new language generator GPT-3 is shockingly good - and completely mindless*" and then continued to search more information about GPT-3 as it looked like "the latest and greatest" as far as Artificial Intelligence goes, at this moment.

Next, we gathered data and information from Eurostat, McKinsey and Ericsson, we analysed it and tried to identify the jobs that would be prone to extinction due to the widespread implementation of AI automation systems. We also tried to do a correlation between the domains affected and the number of people working in those domains, thus showing an approximation of how many people that are currently working in Europe would be affected in the following years.

5. Findings

5.1 Artificial Intelligence creating knowledge - OpenAI's neural network

Everything stated above was true for most of the time since humanity existed, but the breakthroughs in artificial intelligence that happened in recent years can make us question how and who can create knowledge.

A good example is GPT-3 (stands for Generative Pretrained Transformer) and it was created by a company called OpenAI. GPT-3 is interesting because rather than being fine-tuned for a specific problem (like Google's AlphaGo Zero was), it is only given an instruction and some examples (a few lines of text) and it's expected to identify what to do based on this alone (Hassabis, 2017). This approach is called "in-context learning" because the system needs to pick up on patterns in its "context", which is the text that we ask the system to complete. To give a quick explanation of how the system works in plain English, GPT-3 is looking at the text that was imputed by the user and then tries to figure out what is the most appropriate word (from a statistical/mathematical point of view) to follow. It then repeats this process for every word, until it completes the sentence or the text that was requested by the user. The system can do this, because it was previously "trained" using an enormous amount of text and data consisting of hundreds of billions of words from the internet, the whole Wikipedia and also large libraries of digitized books (Askell, 2020).

The interesting part however are the results. In one "experiment", Mario Klingermann (a programmer and artist from Munich, Germany) asked GPT-3 to write an article about Twitter, as if it was Jerome K. Jerome (the famous British writer that lived between 1859 and 1927). All the input that was introduced in the system was the article title "The importance of being on Twitter", the author's name "Jerome K. Jerome" and the first word "It". The resulting article is truly amazing, describing a dialogue between the author (Jerome K. Jerome) and a sexton from London, in the summer of 1897 (keep in mind, the imaginary discussion was about Twitter, a platform invented in 2006). The full article generated by GPT-3 can be found here: shorturl.at/boK18. The implications of such an early version of AGI (Artificial General Intelligence) are massive for organizations all over the world, the system being eligible for use in many "creative" domains which were considered out of the reach of computer automation, at least for this time being. Another astonishing use of GPT-3 is the one built by Sharif Shameem (CEO of debuild.co). He managed to configure GPT-3 in such a way, that it could write computer code. All the user has to do, is to describe in plain English what the code should do and then click generate. GPT-3 will automatically generate the code (so far it can work with HTML and

MySQL) and also show a preview of the results. A more generalized and streamlined implementation of this kind could have great implications in organizations world-wide, IT being one of the largest industries out there (Heaven, 2020).

5.2 The implications of automation for organizations and their employees

As presented above, automation starts to make its way into various new domains, some of which were hard to foresee, like writing articles or programming. This is very important for organizations, as both practical and ethical choices will have to be made in the near future, like choosing to use an AI system to do a certain process rather than a team of people (thus cancelling the jobs of those people). When analysing what jobs are in danger of being cancelled due to automation, it is important to look at the work activities performed by the employees rather than at the occupation itself, as those are the parts of the job that can be taken over by an automated system (Chui et al., 2016).

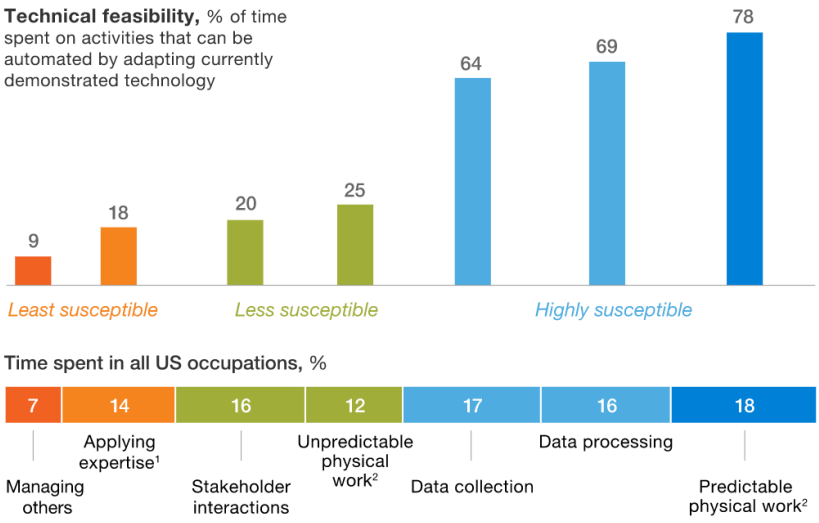

Figure 2. Work activities prone to automation
Source: McKinsey (2016)

As we can see in the *Figure 2*, some of the "safer" activities are the ones that require managing and applying expertise (these are complex activities that require a great level of experience in order to perform, thus being very hard to achieve with automation). At the other end of the spectrum, we have the activities that are most likely to be automated in the near future, activities like data collection, data processing and predictable physical work. The ones that are of interest for this paper are the activities related to data collection and data processing, as the automation of those two could affect the way organizations work all over the world and also

how knowledge is created and shared. After carefully analysing the data provided by the McKinsey & Company report called "The technical potential for automation in the US", we managed to extract the % of time spent on activities like data collection and data processing in a few key domains (McKinsey, 2016). We then corroborated those % with the number of people working in each domain in Europe (data from Eurostat - 2019 was used) to obtain the results that can be seen in the Figure 3 bellow.

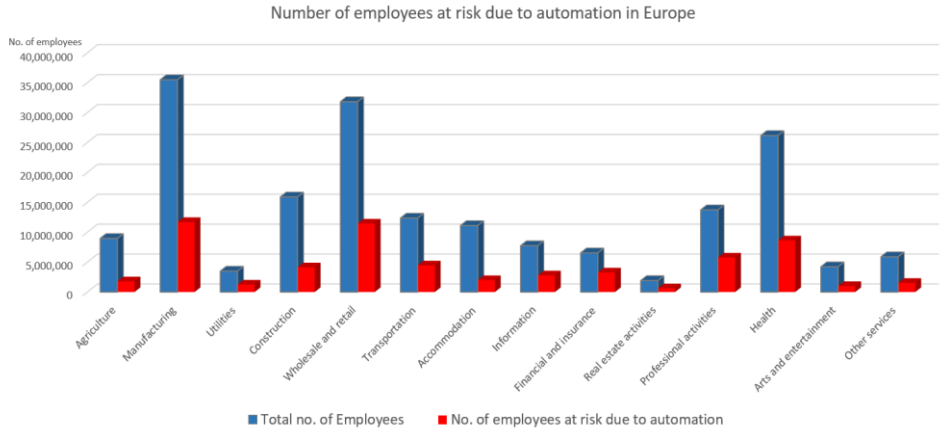

Figure 3. Number of jobs at risk in Europe due to automation
Source: McKinsey and Eurostat (2019)

The results of this data correlation showed that some of the domains where organizations don't need to worry about firing people in the near future are Arts and Entertainment, Accommodation and Construction. On the other hand, we can also observe some domains where automation is coming soon, domains like Financial and Insurance, Information and Transportation. Bear in mind, that it is not the number of people at risk in the Figure 3 above that is the most important (although that is also warring), but rather the % that number represents out of the total number of people working in that domain. For example, out of the total number of people working in Finance and Insurances, approximately 50% are at risk of being replaced by automation systems in the coming years, this being one of the more susceptible domains when it comes to automation. To all of this automation "threat" we can then add the global pandemic that has created even more problems for organizations, some of which were forced to go bankrupt (for example Hertz). We managed to find

some data from a more recent McKinsey report and created the graph bellow to showcase the problem that organizations and their employees face in Europe.

As we can see in Figure 4, the Covid 19 pandemic more than doubled the number of the jobs that are at risk in Europe, some of which (approx. 10% of the total number of jobs in Europe) being at risk from both automation and the pandemic. Some of the more in-depth studies carried out by McKinsey Global Institute suggest that not all countries in Europe will be affected the same by the two factors showcased above (automation and the Covid-19 pandemic) and that the Western Europe is more likely to experience automation in the coming years due to its more developed economy (Sven et al., 2020).

6. Conclusions

As showcased above, the line between human-created knowledge and computer-created knowledge is getting thinner day by day. This should encourage organizations to rethink their knowledge creation and sharing strategies more often, adapting them to the current state of technology and also preparing their systems (and employees) for what is to come (Grigorescu et al., 2019). Although nobody can say for sure at this moment if a "knowledge-revolution" is coming our way, systems like OpenAI's GPT-3 Artificial General Intelligence are surely going to make a difference in the way organizations create and share their knowledge in the future. A lot of ethical and moral dilemmas will soon arise for the senior management boards in large organizations, as they will have to choose whether to make decision based on insights provided by Artificial General Intelligence systems or still rely on knowledge and insights created by humans (Fedorko et al., 2019). Most likely, based on what we've seen so far, we are heading towards an augmented-management, where decisions are still made by humans but the managers are "augmented" with real-time insights by various AI systems (Sven et al., 2020).

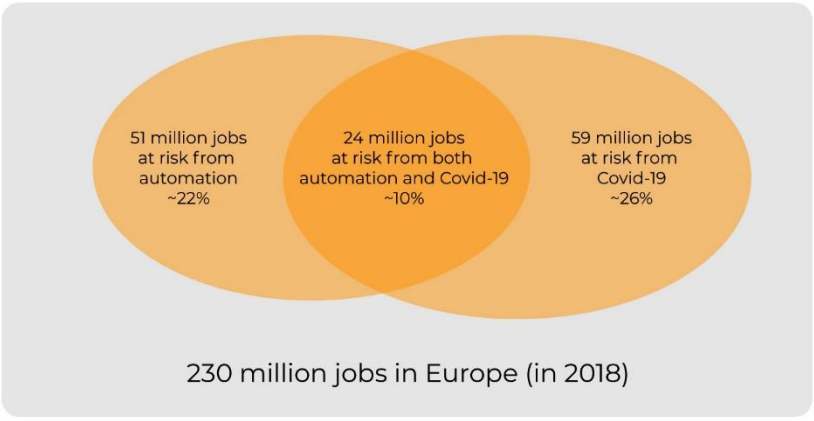

Figure 4. Jobs at risk from automation and Covid 19
Source: McKinsey (2020)

It is equally important to further perfect the way tacit knowledge is shared in organizations, as in the near future it could have a significant impact on the edge that an organization has compared to its competition. As AI's will be accessible to everyone, the tacit knowledge of the employees could be the one that will make a difference and give organizations a competitive advantage (Bernstein, 2013). A great emphasis regarding automation will have to be taken into account in European higher education in the coming years, in order for the future generations to have a reliable workplace (Dima & Vasilache, 2016).

References

[1] Askell, A. (2020). *GPT-3: Towards Renaissance Models*. Retrieved from https://dailynous.com/2020/07/30/philosophers-gpt-3/.

[2] Bejinaru, R. (2019). Opportunities of harnessing organizational knowledge. *Ecoforum*, 8(2).

[3] Bernstein, P. (2013). *SearchCloudSurvery, it takes up to 8 attempts to find an accurate search result.* Retrieved from https://www.techzone360.com/topics/techzone/articles/2013/11/05/359192-searchyourcloud-survey-it-takes-up-8-attempts-find.htm.

[4] Chui, M., Manyika, J., & Miremadi, M. (2016). *Where machines could replace humans and where they can't (yet)*. Retrieved from https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet.

[5] Desjardins, J. (2019). *How much data is generated each day?*. Retrieved from https://www.weforum.org/agenda/2019/04/how-much-data-is-generated-each-day-cf4bddf29f/

[6] Dima, M. A., and Vasilache, S. (2016). Trends in the internationalization of European higher education in a convergence perspective, *Management & Marketing. Challenges for the Knowledge Society*, 11(2), pp. 449-457, DOI: 10.1515/mmcks2016-0008.

[7] Domo (2018). *Data never sleeps 6.0*. Retrieved from https://www.domo.com/assets/downloads/18_domo_data-never-sleeps-6+verticals.pdf.

[8] Ericsson Mobility Visualizer (2020). Retrieved from https://www.ericsson.com/en/mobility-report/mobility-visualizer?f=1&ft=1&r=5,6&t=1&s=1,2,3&u=1&y=2019,2025&c=3.

[9] Eurostat (2019). *Employment by occupation and economic activity - Nace Rev. 2*. Retrieved from https://appsso.eurostat.ec.europa.eu/nui/show.do.

[10] Fedorko, I., Bacik, R., & Gavurova, B. (2018). Technology Acceptance Model in E-Commerce Segment, *Management & Marketing. Challenges for the Knowledge Society*, 13(4), pp. 1242-1256, DOI: 10.2478/mmcks-2018-0034.

[11] Grigorescu, A., Lincaru, C., Pîrciog, S., Chițescu, R-I. (2019). Competitiveness and sustainable development in public services, *Management & Marketing. Challenges for the Knowledge Society*, 14(1), pp. 108-129, DOI: 10.2478/mmcks-2019-0008.

[12] Grover, V. (2019). Do we need to understand the world to know it? Knowledge in a big data world. *Journal of Global Information Technology Management*, 23(1).

[13] Hassabis, D. (2017). *AlphaGo Zero: Starting from scratch*. Retrieved from https://deepmind.com/research/case-studies/alphago-the-story-so-far.

[14] Heaven, W. D. (2020). *OpenAi's new language generator GPT-3 is shockingly good - and completely mindless*. Retrieved from https://www.technologyreview.com/2020/07/20/1005454/openai-machine-learning-language-generator-gpt-3-nlp/.

[15] Kuzior, A., Kwilinski, A., & Tkachenko, V. (2019). Sustainable development of organisations based on the combinatorial model of artificial intelligence. *Entrepreneurship and Sustainability Issues*, 7(2).

[16] Li, D., Landstorm, A., Fast-Berglund, A., & Almstorm, P. (2019). Human-Centred Dissemination of Data, Information and Knowledge in Industry 4.0. *29th CIRP Design Conference*, 84.

[17] McKinsey (2016). Retrieved from https://www.mckinsey.com/~/media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/where%20machines%20could%20replace%20humans%20and%20where%20they%20cant/sector-automation.pdf.

[18] Sven, S., Tacke, T., Lund, S., Manyika, J., & Thiel, L. (2020). *McKinsey - The future of work in Europe*. Retrieved from https://www.mckinsey.com/~/media/mckinsey/featured%20insights/future%20of%20organizations/the%20future%20of%20work%20in%20europe/mgi-the-future-of-work-in-europe-discussion-paper.pdf.

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Residents` Perceptions of Socio-Cultural Impacts of Tourism in Vrnjačka Banja, Serbia

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Abstract

In order to reach the sustainable development of a tourism destination, it is important to investigate how residents perceive the impacts of tourism development. Tourism may cause improvements in residents' quality of life in many aspects of it. On the other side, with a greater number of tourists of different cultures in a destination, unpleasant crowds can occur, which may lead to community disruption, loss of cultural identity of the local community, and to other negative socio-cultural impacts of tourism. The danger of negative impacts of tourism might be even greater when the destination is small, considering the total number of residents and the size of the territory. This paper analyses the residents` perceptions of the socio-cultural impacts of tourism in Vrnjačka Banja, the leading spa destination in Serbia. The survey method was used to collect primary data and it included 110 respondents. Data were processed by Statistical Package for the Social Sciences (SPSS). Results indicate that residents have more negative perceptions of the socio-cultural impacts of tourism in Vrnjačka Banja than positive.

Keywords: tourism, socio-cultural impacts, residents` perceptions, sustainability, Vrnjačka Banja.

JEL Classification: L83, Z30, Z32

1. Introduction

Tourism contributes to meeting different cultures, lifestyles, and consequently better understanding of different people (Podovac et al., 2019). Since traveling is becoming easier, different cultures are mixing more often. The communication between people from different parts of the world and with different cultural background is not always easy. Conflicts can easily arise when cultures mix, but it is important to deal with these problems so they do not escalate (Kostalova, 2017). Socio-cultural impacts are the 'human impacts' of the tourism industry, with an

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emphasis on changes in the quality of residents' daily life in tourism destinations and cultural impacts related to transformations in traditional values, norms, and identities arising from tourism (Glasson et al., 1995; Zhuang et al., 2019).

Balancing the economic, socio-cultural, and environmental impacts of tourism is the basic principle of sustainable development (Đorđević & Kostić, 2019). Therefore, to achieve sustainability, social responsibility and economic profit should not be contradictory, but rather complementary (Zdravković, & Peković, 2020). Also, for successful sustainable tourism development, a crucial factor is residents' participation and cooperation (Yu et al., 2011). To reach this, it is important to observe residents` perception of tourism impacts, because their attitude toward tourism development depends on it (Woo et al., 2018).

The subject of this study is the analysis of the socio-cultural impacts of tourism and the residents` perceptions of them, using the example of one of the most visited tourism destinations in Serbia, Vrnjačka Banja.

2. Problem Statement

Countries with strong economies implement consistent development policies and record performance on all three levels − economic, social, and environmental (Subic et al., 2010; Popescu et al., 2017), which are the three key dimensions of sustainability. Economies of different countries have shown vulnerability to a range of internal and external factors (Andrei et al., 2018). Some studies underline human capital as a factor of importance for different processes that rely on it (Dincă et al., 2019), just like tourism does.

Residents' perceptions of tourism development in destinations have been a lasting study topic of tourism (Brida et al., 2011; Jaafar et al., 2017). For the long-term success of the tourism destination, it is important to understand and assess the residents' perceptions regarding the impacts of tourism development (Ritchie & Inkari, 2006). A clear understanding of the attitudes, perceptions, and opinions of the local residents is a necessary prerequisite to the planning and management of sustainable tourism in a destination (Byrd & Gustke, 2004). Attracting and retaining residents of a particular community are fundamentally dependent on the provision of quality social infrastructure, with a positive impact on both employment levels and local entrepreneurship (Chivu, 2019). Residents' perceptions involve economic, social, cultural, political, and environmental outcomes of tourism development, which play a significant role in residents' overall opinion about the living conditions of the community. Also, residents' perceptions of tourism impact influence not only residents' attitudes toward tourism, but also their overall life satisfaction (Woo et al., 2018).

The majority of empirical and theoretical studies have focused on the socio-cultural impacts of tourism and residents' perceptions towards tourists and tourism development in the given destination, as well as their support for tourism development projects (Andereck et al., 2005; Deery et al., 2012; Sirakaya et al., 2002). The socio-cultural impacts of tourism are created during the stay in the destination when tourists interact with residents and the outcome of their relationship

changes the host individuals` and host community`s quality of life, value systems, labor division, family relationships, attitudes, behavioral patterns, ceremonies and creative expressions (Rátz, 2000).

The impacts of tourism can be classified as negative when they contribute to the disruption of society's components, and as positive when they upgrade vital attributes (Türker & Öztürk, 2013). On one side, tourism has become a key economic development strategy for many countries because of its potential to generate foreign exchange earnings, to encourage foreign investment, increase tax revenues, more employment opportunities for residents and higher personal income (Pırnar & Günlü, 2012; Ramseook-Munhurrun & Naidoo, 2011). Tourism improves residents' quality of life through the development and improvement of local facilities and activities (e.g. more recreational and cultural facilities, more events and cultural activities available for residents) and public infrastructure (roads, airports, water supply, and sewage treatment systems and electricity supply) (Lourenco-Gomes et al., 2019; Sharpley, 2018; Zaei & Zaei 2013). The admiration of tourists for local culture, arts, tradition, or customs can increase the cultural pride of the local community and revive aspects of this culture that have been declining. The positive attention of tourists for local culture can encourage young people in the host community to become actively involved (Inkson & Minnaert, 2018). Tourism also positively affects the quality of community services.

On the other side, tourism can cause communities to suffer from higher living costs (eg. rising prices of goods and services, of property taxes, of land, etc.), crime increase (eg. gambling, drug trafficking, prostitution), negative environmental impacts (eg. increased garbage, air, and water pollution, destruction of natural resources), as well as negative cultural impacts (eg. changes to local arts or customs) (Rasoolimanesh et al. 2017; Yun & Zhang, 2017). One of the major negative socio-cultural impacts of tourism is the demonstration effect. It happens when tourists influence the behavior of the host population. The local population's aspirations to the material values of tourists lead to the copying with tourists' behavior patterns. The younger local residents are more susceptible to the demonstration effect (Bello et al., 2017; Wall & Mathieson, 2006).

The economic impacts of tourism are seen as positive impacts, while socio-cultural and environmental are more seen as negative (Gill, 2015). The focus of this study is on both positive and negative socio-cultural impacts of tourism in a spa destination, which is a contribution to this field of study considering that there is less researche focusing on tourism impacts in spa destinations.

3. Research Questions/Aims of the research

After the capital city of the Republic of Serbia – Belgrade, Vrnjačka Banja is the most visited tourism destination in this country (Statistical Office of the Republic of Serbia, 2020). It is located in the central part of the Republic of Serbia and it is characterized by great natural resources, like climate, flora, fauna, and thermo-mineral waters, which are the basis for tourism development (Milićević, 2015). According to the 2011 Census, there were 27,527 inhabitants (Statistical Office

of the Republic of Serbia, 2011). In 2019 there were 283,491 tourists and in the last few years, tourism had a growing tendency (Statistical Office of the Republic of Serbia, 2020). Considering this, the question that arises is how residents of this small spa tourism destination perceive the impacts of tourism. The aim of this study is to investigate how residents perceive the socio-cultural impacts of tourism in Vrnjačka Banja.

4. Research Methods

For data collection, a survey method was used. The questionnaire is divided into two parts. The first part consists of the questions related to the socio-demographic characteristics of respondents. To make sure that the questionnaire is filled in only by residents, the respondents first answered the question of whether they live on the territory of the municipality of Vrnjačka Banja.

The second part consists of statements related to the socio-cultural impacts of tourism in Vrnjačka Banja. Residents provided answers using a five-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). The statements were defined on the basis of Kim's (2002) and Zhuang et al., (2019) studies, with small adaptation to conditions of tourism in Vrnjačka Banja. Socio-cultural impacts are divided as positive and negative. The questionnaire was distributed in the form of a Google questionnaire in July 2020. A total of 110 residents filled in the questionnaire.

5. Findings

Out of 110 respondents who took part in this research 64 are male (58.2%) and 46 are female respondents (41.8%) respondents aged 20-30 have the highest participation in the sample (53.6%). The largest number of respondents belongs to the category of respondents that are high school graduates (38.2%) (Table 1).

Table 1. Socio-demographic characteristics of respondents

		Frequency	**Percent**
Gender	Male	64	58. 2
	Female	46	41. 8
Age	20-30	59	53. 6
	31-40	30	27. 3
	41-50	12	10. 9
	51-60	5	4. 5
	> 60	4	3. 6
Level of education	High school graduate	42	38. 2
	Vocational degree	10	9. 1
	Bachelor's degree	34	30. 9
	Master degree	20	18. 2
	Doctoral degree	4	3. 6

Source: Authors, based on research

In the second part of the questionnaire, respondents could agree or disagree by using a five-point Likert scale about 7 statements that describe positive and 7 statements that describe negative socio-cultural impacts of tourism in Vrnjačka Banja. The 14 items of the positive and negative socio-cultural impacts of tourism were subjected to Factor analysis using SPSS. Data are suitable for factor analysis considering that the Kaiser-Meyer-Oklin value is .80, which is higher than recommended value of .6. According to Bartlett`s Test of Sphericity, the statistical significance was reached (sig.=.000) (Table 2).

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.802
Bartlett's Test of Sphericity	Approx. Chi-Square	871.243
	df	91
	Sig.	.000

Source: Authors, based on research

Factor analysis revealed the presence of four factors eigenvalues exceeding 1 (37.4%, 19.4%, 9.4%, 7.4% of the variance), but according to the Scree plot there is a break after the second factor. Because of this, two factors are used for further analysis, which explain 58.9% of the variance. For the better interpretation of these two factors Oblimin rotation is used. This revealed the presence of simple structure. Both factors showed a strong loading, with positive impacts items loading strongly on Factor 2, and negative impacts items loading strongly on Factor 1. Therefore, the results of the Factor analysis support the use of the positive socio-cultural impacts items and negative socio-cultural impacts items as separate scales (Table 3). Between the Factor 1 and Factor 2 there is a weak positive correlation (r=0.234).

Table 3. Rotated factor loadings and communalities, Oblimin rotation

Variable	**Factor**		**Communality**
	1	**2**	
More variety in recreational activities and facilities	.344	**.430**	.372
Improved public infrastructure	.364	**.534**	.509
Preservation of local services	.070	**.664**	.468
An amelioration of local image	-.069	**.747**	.539
Revitalized local cultural practices and maintained cultural identity	-.127	**.843**	.677
Increased residents` pride of the local culture	-.170	**.811**	.623
A better quality of life	.088	**.694**	.518
For peak season it is harder to use local facilities and services	**.766**	.014	.592

Variable	Factor		Communality
	1	2	
Because of tourism, promenade and streets are unpleasantly overcrowded	**.892**	-.037	.782
Because of tourism parks are unpleasantly overcrowded	**.838**	.051	.725
Because of tourism shopping places are unpleasantly overcrowded	**.878**	.029	.784
Traffic congestion	**.803**	.110	.698
Tourism encourages residents to imitate the behavior of the tourists and relinquish cultural traditions	**.513**	-.088	.250
Tourism causes the disruption of traditional cultural behavior patterns in local residents	**.666**	-.057	.429
% of variance explained	37.4%		19.4%

Source: Authors, based on research

The assessment of the internal consistency and validity of the sample was carried out using the Confirmatory Factor Analysis (CFA). For the positive socio-cultural impacts of tourism Cronbach alpha coefficient is 0.825 and for the negative socio-cultural impacts it is 0.886, which indicates that the condition of the internal consistency is achieved (Table 4).

Table 4. The results of reliability statistics

	Cronbach's Alpha	N of Items
Positive socio-cultural impacts	0.825	7
Negative socio-cultural impacts	0.886	7
All variables	0.860	14

Source: Authors, based on research

When it comes to positive impacts, the results of the descriptive statistics show that the respondents mostly agree that tourism in Vrnjačka Banja brings *More variety in recreational activities and facilities* (M = 3.8). Respondents expressed a high level of agreement regarding the statements that tourism in Vrnjačka Banja *Improved public infrastructure* (M=3. 5) and creates *A better quality of life* (M=3.3). With a mean score below 3, respondents rated statements that tourism brings *Preservation of local services* (M=2.9), *An amelioration of local image* (M=2.9), *Revitalized local cultural practices and maintained cultural identity* (M=2.7) and even greater disagreement was expressed by respondents towards a statement that tourism *Increased residents` pride of the local culture* (M=2.5) (Table 5).

Table 5. Positive socio-cultural impacts of tourism in Vrnjačka Banja

Positive socio-cultural impacts	N	Mean	Std. Deviation	Variance
More variety in recreational activities and facilities	110	3. 7727	1. 03746	1. 076
Improved public infrastructure	110	3. 5273	1. 16295	1. 352
Preservation of local services	110	2. 8818	1. 24688	1. 555
An amelioration of local image	110	2. 9455	1. 14808	1. 318
Revitalized local cultural practices and maintained cultural identity	110	2. 7091	1. 15215	1. 327
Increased residents` pride of the local culture	110	2. 5364	1. 05515	1. 113
A better quality of life	110	3. 3455	1. 02659	1. 054

Source: Authors, based on research

On the other side, respondents agreed that *Traffic congestion* is the most negative impact of tourism in Vrnjačka Banja (M=4.3), and secondly it is the statement that *Because of tourism, promenade and streets are unpleasantly overcrowded* (M= 4.1). The other negative sociocultural impacts are also rated with a mean score above 3: *Because of tourism shopping places are unpleasantly overcrowded* (M=3.9), *Because of tourism parks are unpleasantly overcrowded* (M=3.9), *For peak season is harder to use local facilities and services* (M=3.9), *Tourism causes the disruption of traditional cultural behavior patterns in local residents* (M=3.5), and the greatest disagreement from all the negative impacts was expressed by respondents towards the statement that *Tourism encourages residents to imitate the behavior of the tourists and relinquishes cultural traditions* (M=3.1) (Table 6).

Table 6. Negative socio-cultural impacts of tourism in Vrnjačka Banja

Negative socio-cultural impacts	N	Mean	Std. Deviation	Variance
For peak season is harder to use local facilities and services	110	3. 9000	1. 07473	1. 155
Because of tourism, promenade and streets are unpleasantly overcrowded	110	4. 0909	1. 12963	1. 276
Because of tourism parks are unpleasantly overcrowded	110	3. 9182	1. 07628	1. 158
Because of tourism shopping places are unpleasantly overcrowded	110	3. 9409	1. 12922	1. 275
Traffic congestion	110	4. 3455	1. 05305	1. 109
Tourism encourages residents to imitate the behavior of the tourists and relinquishes cultural traditions	110	3. 1091	1. 23664	1. 529
Tourism causes the disruption of traditional cultural behavior patterns in local residents	110	3. 4727	1. 19409	1. 426

Source: Authors, based on research

Considering that the overall mean rating of positive impacts (M=3.1) is lower than the overall mean rating of negative impacts (M = 3.8), residents' perceptions towards socio-cultural impacts of tourism in Vrnjačka Banja is rather negative, than positive (Table 7).

Table 7. Descriptive Statistics of Factors

	N	Min.	Max.	Mean	Std. Dev.
Positive socio-cultural impacts	110	1.00	4.71	3.1026	.78321
Negative socio-cultural impacts	110	1.00	5.00	3.8325	.87055
Valid N (listwise)	110				

Source: Authors, based on research

6. Conclusions

Planning sustainable tourism development would not be complete without reaching a balance between the interest of crucial stakeholders. Although tourism brings positive impacts for residents, negative impacts must be considered in order to reach their support for tourism development.

Results of this study revealed that residents mostly agree that tourism in Vrnjačka Banja creates more variety in recreational activities and facilities, improves public infrastructure and the quality of life, but also that it creates traffic congestion and crowds on the streets, promenade, parks, and shopping places. Overall, residents have rated negative socio-cultural impacts of tourism with slightly higher mean score than positive ones. This indicates that their overall perception of the socio-cultural impacts of tourism in Vrnjačka Banja is more negative, than positive.

The main limitation of this study is the small number of residents included in the research comparing to the total number of population in Vrnjačka Banja. The results of this research may be used for further planning and improving the tourism offer of Vrnjačka Banja according to sustainable development practices. Also, the research can be used for the comparative analysis of the socio-cultural impacts of tourism in spa destinations. Further research should focus on finding if there is a difference in residents' perceptions of tourism impacts in spa destinations, namely economic, environmental, and socio-cultural.

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References

[1] Andereck, K., Valentine, K. M., Knopf, R., & Vogt, C. (2005). Residents' perceptions of community tourism impacts. *Annals of Tourism Research*, 32(4), 1056-1076.

[2] Andrei, J., Zaharia, M., & Dragoi, M. C. (2018). Impact of the main currencies exchange rates on the Romanian economic policy transformation. *Montenegrin Journal of Economics*, 14(2), 7-19.

[3] Bello, F.G., Carr, N., Lovelock, B., & Xu, F. (2017). Local residents' perceptions of socio-cultural impacts of tourism in Mangochi, Malawi. *Advances in Hospitality and Tourism Research (AHTR)*, 5(1), 1-22.

[4] Brida, J., Riaño, E., & Aguirre, S. (2011). Residents' attitudes and perceptions towards cruise tourism development: A case study of Cartagena de Indias (Colombia). *Tourism and Hospitality Research*, 11(3), 181-196.

[5] Byrd, E. T., & Gustke, L. D. (2004). Identifying tourism stakeholder groups based on support for sustainable tourism development and participation in tourism activities. In Pineda, F. D. and Brebbia, C. A. (Eds). *Sustainable tourism: The sustainable world*, pp. 97-108, WIT Press: London.

[6] Chivu, L. (2019). Local entrepreneurship and social services in Romania. Territorial analysis. *European Research on Management and Business Economics,* 25(2), pp. 79-86.

[7] Deery, M., Jago, L., & Fredline, L. (2012). Rethinking social impacts of tourism research: A new research agenda. *Tourism Management*, 33(1), pp. 64-73.

[8] Dincă, V. M., Dima, A. M., & Rozsa, Z. (2019). Determinants of cloud computing adoption by Romanian SMEs in the digital economy. *Journal of Business Economics and Management*, 20(4), pp. 798-820.

[9] Đorđević, N., & Kostić, M. (2019). Factors that affect the tourists perception about the destination ecological sustainability. In: Subić, J., Jeločnik, M., Kuzman, B., & Andrei, J. V. (eds.) *International Scientific Conference, Sustainable Agriculture and Rural Development in Terms of the Republic of Serbia Strategic Goals Realization Within the Danube Region*, Thematic Proceeding, pp. 572-588, Belgrade: Institute of Agricultural Economics.

[10] Gill, K. (2015). Tourists' perceptions about tourism impacts a literature review. *Journal of Business Thought*, 5, pp. 71-85.

[11] Glasson, J., Godfrey, K., & Goodey, B. (1995). *Towards visitor impact management: visitor impacts, carrying capacity and management response in Europe's historic towns and cities*. Avebury: Aldershot, UK.

[12] Inkson, C., & Minnaert, L. (2018). *Tourism Management an Introduction*, Second Edition, London: SAGE Publications Ltd.

[13] Jaafar, M., Rasoolimanesh, S. M., & Ismail, S. (2017). Perceived sociocultural impacts of tourism and community participation: A case study of Langkawi Island. *Tourism and Hospitality Research*, 17(2), pp. 123-134.

[14] Kim, K. (2002). *The effects of tourism impacts upon quality of life of residents in the community*, Doctoral dissertation, Virginia Tech.

[15] Kostalova, B. (2017). *Tourism impact* and *residents' perspectives*: *The* case *of Zell am See-Kaprun*. Master Thesis, Modul Vienna University, Austria.

[16] Lourenco-Gomes, L., Rebelo, J., & Ribeiro, C. (2019). Residents' perceptions of a World Heritage property: a multivariate analysis. *Journal of Cultural Heritage Management and Sustainable Development*, 9(2), pp. 212-226.

[17] Milićević, S. (2015). *Od tradicionalnih banjskih lečilišta do destinacija zdravstvenog turizma* [*From traditional spas to destinations of health tourism*]. Vrnjačka Banja: University of Kragujevac, Faculty of Hotel Management and Tourism in Vrnjačka Banja.

[18] Pırnar, I., & Gunlu, E. (2012). Destination management and quality-of-life. In M. Uysal, R. Perdue, & M. J. Sirgy (Eds.), *Handbook of tourism and quality-of-life research*, pp. 529-545, Dordrecht, Netherlands: Springer.

[19] Podovac, M., Đorđević, N., & Milićević, S. (2019). Rural tourism in the function of life quality improvement of rural population on Goč mountain. *Economics of agriculture*, 66(1), pp. 205-220.

[20] Popescu, G. H., Sima, V., Nica, E., & Gheorghe, I. G. (2017). Measuring sustainable competitiveness in contemporary economies − Insights from European economy. *Sustainability*, 9(7), p. 1230.

[21] Ratz, T. (2000). Residents' Perceptions of the Sociocultural Impacts of Tourism at Lake Balaton, Hungary. In: Richards, G., Derek, H. (eds.) *Tourism and Sustainable Community Development*, pp. 36-47, London: Routledge.

[22] Ramseook-Munhurrun, P., & Naidoo, P. (2011). Residents' attitudes toward perceived tourism benefits. *International Journal of Management and Marketing Research*, 4(3), pp. 45-56.

[23] Rasoolimanesh, S. M., & Jaafar, M. (2017). Sustainable tourism development and residents' perceptions in world heritage site destinations. *Asia Pacific Journal of Tourism Research*, 22(1), pp. 34-48.

[24] Ritchie, B.W., & Inkari, M. (2006). Host community attitudes toward tourism and cultural tourism development: The case of the Lewes District, Southern England. *International Journal of Tourism Research*, 8(1), pp. 27-44.

[25] Sharpley, R. (2018). *Tourism, tourists and society*. 5th ed., Milton: Routledge.

[26] Sirakaya, E., Teye, V., & Sönmez, S. (2002). Understanding residents support for tourism development in the Central Region of Ghana. *Journal of Travel Research*, 41(1), pp. 57-67.

[27] Statistical Office of the Republic of Serbia (2011). *Census 2011*. Retrieved from http://www.stat.gov.rs/en-US/oblasti/popis, 14 July 2020.

[28] Statistical Office of the Republic of Serbia (2020). *Tourists turnover, December 2019*. Retrieved from https://publikacije.stat.gov.rs/G2020/PdfE/G20201020.pdf, 14 July 2020.

[29] Subic, J., Vasiljevic, Z., & Andrei, J. (2010). The impact of FDI on the European economic development in the context of diversification of capital flows. *Proceedings of the 14th International Business Information Management Association, Business Transformation through Innovation and Knowledge Management: An Academic Perspective, Istanbul, Turkey*, pp. 23-24.

[30] Türker, N., & Öztürk, S. (2013). Perceptions of residents towards the impacts of tourism in the Küre Mountains National Park, Turkey. *International Journal of Business and Social Science*, 4(2), pp. 45-56.

[31] Wall, G., & Mathieson, A. (2006). *Tourism: change, impacts, and opportunities*. Harlow: Pearson Education.

[32] Woo, E., Uysal, M., & Sirgy, M. J. (2018). Tourism impact and stakeholders' quality of life. *Journal of Hospitality & Tourism Research*, 42(2), pp. 260-286.

[33] Yu, C. P., Chancellor, H. C., & Cole, S. T. (2011). Measuring residents' attitudes toward sustainable tourism: A reexamination of the sustainable tourism attitude scale. *Journal of Travel Research*, 50(1), pp. 57-63.

[34] Yun, H. J., & Zhang, X. (2017). Cultural conservation and residents' attitudes about ethnic minority tourism. *Tourism and Hospitality Research*, 17(2), pp. 165-175.

[35] Zaei, M. E., & Zaei, M. E. (2013).The impacts of tourism industry on host community. *European Journal of Tourism Hospitality and Research*, 1(2), pp. 12-21.

[36] Zdravković, S., & Peković, J. (2020). The analysis of factors influencing tourists' choice of green hotels. *Hotel and Tourism Management*, 8(1), pp. 69-78.

[37] Zhuang, X., Yao, Y., & Li, J. J. (2019). Sociocultural impacts of tourism on residents of world cultural heritage sites in China. *Sustainability*, 11(3), p. 840.

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Navigating a Global Pandemic with Business Excellence in Mind: The Whys and the Hows

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Abstract

This paper explores how teaching ESP to Business students might contribute to their becoming better prospective leaders and entrepreneurs. Making a case for competency-based education, it aims to demonstrate that enhancing students' critical thinking skills is vital. The SARS-CoV-2 crisis has been a catalyst for sudden and forcible change in the field of teaching, fostering a shift in how Business Education should be tackled. The most burning questions on which this study focuses are not only which teaching strategies might guarantee the shaping up of the true leaders of tomorrow's business world, but also what lessons the current Covid–19 pandemic has forced the academic community to learn, in light of the already-existing gaps in education approaches. By examining the most common hurdles and setbacks that a Business Communication in English professor might come across, the paper attempts to provide valid solutions for a fruitful teaching-learning process, mindful of curriculum design and the pitfalls of the e-learning environment. It also argues in favor of all-inclusive learning as best meeting the needs of today's digital natives, in a collaborative and choice-based environment that should ensure a productive online learning experience. Business Communication in English skills are shown to be key factors of economic competitiveness and growth in the global economy. Education in entrepreneurship is not (or should not be) limited to learning about company ownership or job creation, but also about social responsibility and civil leadership, therefore education in entrepreneurial skills as a lifelong learning goal must officially become part of regulated education.

Keywords: Business excellence, distance education, holistic learning, critical thinking, Business Communication in English, entrepreneurial leadership, pandemic.

JEL Classification: A12, I20, I21, I23, Z13

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1. Introduction

1.1. Teaching in the time of pandemic: A grassroots experience

The global crisis generated by the SARS-CoV-2 pandemic has clearly shaken our whole world to the core. One of the lesser expected consequences of this predicament has been a renewed interest in distance learning, since educators all over the world were forced − virtually overnight − to vacate the physical classroom and embrace online teaching. That is why, without much previous notice, we were all put in the strange and somewhat uncomfortable position of having to instantly master something new, without any sort of training. And nothing trains one better than necessity.

Virtual teaching starts from the principle that students and teachers (be they tutors, instructors, or professors, regardless of their academic rank) do not need to find themselves in the same physical space at the same time in order for the learning process to actually take place. In the case of distance learning, the two parties stay in contact with one another through an online system, also known as an e-learning platform.

Online teaching is a new learning model that is currently very successful due to its various benefits and advantages, such as flexibility of time and space, economy, scalability, not to mention that it is a dynamic, innovative, and interactive way of consuming new content.

Technology is altering the way in which students relate to institutions and their teachers, causing an evolution in education itself. Nowadays, in our increasingly virtual world, an unprecedented number of activities can be solved digitally[2], and the success of virtual teaching proves this theory in practice, as its demand tends to increase every year.

1.2. A classification of the new challenges facing distance education

A) The new digital divide

As stated in the Introduction to Mark Warschauer's book *Technology and Social Inclusion: Rethinking the Digital Divide*, "a digital divide is marked not only by physical access to computers and connectivity but also by access to the additional resources that allow people to use technology well." (Warschauer, 2010, p. 6).

There are several types of students:

- those who have access to the Internet and know how to use it,

[2] According to the UN's 2019 *Digital Economy Report*, "The digital revolution has transformed our lives and societies with unprecedented speed and scale." (iv)

- those who have access to the Internet and do not know how to use it properly or whose gadgets are subpar and cause tech-related trouble,
- those without Internet access.

As shown in the UN's most recent *Digital Economy Report* (2019), the digital divide continues to be a challenge for education and, more specifically, for virtual teaching environments. In education, the digital divide stems from the students' lack of access to technology. The financial and logistical path to accessing technology is the main step towards students' being able to use these resources correctly and achieve first-rate learning outcomes.

B) Student motivation

Although it is vital that student motivation be intrinsic, creating the right online environment in which students are most inclined to learn and where they also feel motivated extrinsically should be the primary responsibility of those in charge of designing the curriculum. Professors need to constantly interact with students in order to put the latter's mind at ease and provide support whenever necessary, even though the two parties cannot meet in person and are forced to look at other from behind a screen. The online instructional environment must be adequately planned and explicitly established, although this is not sufficient to preserve the student's curiosity or support intrinsic motivation (Bain, 2012).

When it comes to stimulating student enthusiasm, the primary role falls to the teacher, who must predict and prevent the distinctive motivational challenges that online education presents. One method towards achieving this goal is increasing interactions through a variety of e-learning methods. Students previously used to in-person teaching often feel anxious about online learning and need to feel connected, relaxed, and safe in order to be able to contribute in this unique educational setting. To help relieve their students' stress, professors must provide varied and surprising ways of interaction and communication, via videos, chats, forums, and even social media platforms.

C) Designing the curriculum

According to the OECD's *PISA 2012 Technical Report* (2014), insufficient time spent on curriculum development and design can be a contributing factor to a poorly developed virtual teaching experience, as well as a significant challenge for professors in the context of e-learning. Thus, it is imperative that all educators dedicate the necessary amount of time required to design and implement a lesson.

One way to surmount the pressing issue of time is for professors to collaborate frequently within their specialized e-learning communities. Collaborating with their peers allows professors to share, develop, and create a high-quality syllabus. This collaboration is meant to help minimize the time spent on lesson planning and pedagogic strategizing. One way to overcome the challenges of insufficient lesson planning can be addressed by focusing more on the students' individual needs and should include the following characteristics:

- opportunities for students to collaborate,
- a well-established protocol for communicating,
- clear performance expectations,
- opportunities for students to choose how assignments are created and presented.

For professors and students to succeed, these features are essential to the overall design of the course and the e-learning environment. If properly applied, they can transform virtual teaching into an innovative approach to learning − a holistic one, meant to meet the needs of today's digital natives[3] in an environment comprised of collaboration, choice, and a variety of electronic resources that support a successful online learning experience. However, in order for students to be successful in this novel learning environment, the challenges of e-learning must be overcome with constant support from instructors, customized solutions to frequently encountered difficulties, and teacher training.

2. Problem statement

Although Prensky's description of the digital native applies to many a student nowadays, the use of technology for teaching can prove overwhelming and even present students with motivational challenges. The burden of helping students overcome these difficulties falls on the faculty's shoulders, in the sense that instruction must sometimes be complemented by a steady dose of reassurance and psychological support from professors[4].

Adapting one's subject matter and teaching style to the rigors of online teaching can prove a daunting task for educators, who must make steady efforts to also incorporate those elements of the curriculum that are indeed applicable to the e-learning environment − which can be time-consuming, while the margin for error is very slim indeed.

Boasting its own e-learning platform and faculty's previous engagement with blended learning, the Bucharest University of Economic Studies is capable of providing its students with the experience of a virtual campus which can be accessed from any device, such as a PC, Mac, tablet or smartphone, without space-time barriers. Today one can learn from virtually anywhere, since the learning spaces are now different from anything we had ever dared to imagine.

In an increasingly connected world, the use of technology in teaching is essential. It is crucial that educators everywhere use this global pandemic as both a lesson and a teaching moment, thus grasping the importance of meeting students'

[3] "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach." (Prensky, 2012, p. 203).

[4] Many US universities provide information on their websites for students on how to deal with trauma caused by the COVID-19 pandemic (https://www.northwestern.edu/counseling/outreach-education/covid-19-resources/index.html), citing concerns regarding the students' emotional wellbeing and overall mental health.

current and future needs by creating a new approach that is increasingly student-centric, while still remaining true to the values of high-quality education.

3. Aims of the research: Conceptualizing critical thinking as a key element to successful education in the post-truth era

Nowadays, assessing critical thinking skills in the classroom may take many different shapes and forms. The growing interest in measuring students' academic prowess comes from the need to verify the effectiveness of the teaching methods applied to this very end. It is vital to ascertain whether the various academic programs do indeed manage to improve the students' thinking skills. But the evaluation of critical thinking faces a preceding difficulty, namely describing what the latter truly means (Davies & Barnett, 2017). There are various ways to define critical thinking[5], and the way we assess intellectual skills very much depends on how we understand them. The various assessment initiatives developed have faced serious issues regarding their legitimacy, which have, in turn, put their very feasibility into question.

When it comes to developing students' critical thinking skills[6], education plays an important part. Moreover, a key aspect of teaching is appraising one's own results. Regarding the development of thinking skills, it is also necessary to determine whether certain teaching approaches really work or not. The most immediate benefit would be examining whether the students' performance has genuinely improved in the wake of taking a course for that specific purpose, compared to the time before receiving it (Sobkowiak, 2008).

It seems reasonable to believe that citizens with future responsibilities in society should put sufficient emphasis on developing their argumentation or decision-making skills − in short, that they should master those skills which define critical thinking. Social concern regarding leaders' ability to make sound decisions or solve complex problems seems perfectly reasonable. As such, we might construe that the effort to measure the capacity for critical reflection does not solely regard students in classrooms but is also a serious social concern.

People − from children to adults − are inclined to believe whatever they are told (without questioning the source any further) when informed by a figure of authority, especially when that authority is academic. Education is the basis of a country's social and economic development. The great powers of the First World base a large part of their development on the steady rise of professionals trained to get involved in the political and social issues of their country. Hence, the current university environment seeks to teach through a combination of work and study,

[5] According to the Stanford Encyclopedia of Philosophy, "Critical thinking is a widely accepted educational goal. *Its definition is contested* [emphasis added], but the competing definitions can be understood as differing conceptions of the same basic concept: careful thinking directed to a goal." (https://plato.stanford.edu/entries/critical-thinking/).

[6] The most logical antidote to the avalanche of conspiracy theories flooding the internet via social media, especially in the COVID-19 era, seems to be teaching one's students about the importance of critical thinking.

that is, through both experience and knowledge. Therefore, encouraging critical thinking plays a crucial role in the formation of any future professional. An individual who thinks critically tends to lead an existence that is rational as much as it is empathic.

When preconscious mental processes have an appropriately complex architecture, informed decisions can be made taking into account internal needs, objectives, and external contingencies, including the unconscious and preconscious part, as well as the conscious experience. To generate such a solid and well-grounded structure, the continuous construction of knowledge is necessary, which is generated through experience, interaction, analysis, and reflection, as postulated by the constructivist theory.

To make this knowledge continuous, the pedagogical field proposes various teaching methods meant to reinforce and encourage critical thinking in a more productive way. From preschool to university, various techniques and innovative forms of teaching are being proposed. In this context, it might be interesting to ascertain whether strategies focusing on problem-based learning allow for the development of sub-competencies in the direction of interpreting and analyzing information, assessing a specific situation by making use of both objective and subjective data, and inferring the consequences of individual decisions based on self-regulated reasoning.

Returning to the importance of including competency-based education in the training of individuals capable of facing the demands of society and identifying critical thinking as a reflexive and constructive form of knowledge (Ogle et al., 2007), it might be worth considering problem-solving techniques as a valid strategy to foster generic and individual competencies in higher-education students.

Working in the classroom using innovative teaching-learning techniques allows for the whole class to stay involved, favoring active participation. In addition, it becomes possible to observe how vital learning skills are developed just as the problem at hand is getting solved. Therefore, it becomes clear that problem-solving exercises favor the competencies related to assessing a specific situation, using objective and subjective data. As such, analysis, reflection, synthesis, interpretation, and inference are applicable when the aforementioned technique is used. To generate critical thinking, active learning is required. Students must learn a concept in order to internalize, apply, and observe the value of what has been learned − thus, self-evaluation and the evaluation of one's peers prove to be an integral part of knowledge acquisition.

Work in the classroom is a continuous challenge in which we must innovate every day, to favor the learning processes. The role of the teacher is to be active in this process, seeking the necessary tools to consolidate an upward learning trend that should have a substantial impact on the personal and academic development of young people. As an educator, one must constantly bear in mind that teaching by competencies favors the formation of complex and capable people in a society that requires entrepreneurs who are also hungry for knowledge and possess the ability

to face the challenges of today's world without falling prey to false information, 'fake news,' and unsubstantiated claims.

For these purposes, the ability to argue in a logical and well-informed manner consists in the relevant and useful management of data, of the flow of information, and the wealth of knowledge at one's disposal, with the aim of being persuasive by providing compelling arguments. The milieus of dialogue, discussion, and debate require the strategic use of this skill. It is not always necessary to argue, but any argument should be conducted according to a well-established set of rules. Avoiding pseudo-arguments, fallacies, subterfuges, and bad reasoning are all aspects with which a person boasting good critical thinking skills should be familiar.

As such, the teacher must ask their students to justify (give reasons) or explain (give causal guidelines) a statement that they believe is sound. The teacher must require the students to construct an argument, which will then be rigorously evaluated. The skills of inference and argumentation come into play: the student must consider the premises and how they lead fallibly or infallibly to the conclusion. If the conclusion one wishes to reach (or support) has terms that commit one to a particular type of inference and unique sort of logic, then one must exhibit greater skill and knowledge still. In order to make sure that they tolerate analysis and withstand possible criticism, many arguments should be carefully scrutinized. Students must be able to draw their own informed/educated conclusions, at which point they are also expected to 'pay the price' of their initial assumptions and the respective consequences. Students must be led to understand that they are expected to construct a system using their own reasoning, as well as explain and convince others of what they think, of what they observe, and of what they consider relevant epistemically, logically, and axiologically.

As previously explained, critical thinking is a multicomponent-type process. Any proper method of evaluating the students' critical thinking skills must ensure that those thought components are adequately quantified. The factors that make up any test aiming to measure critical thinking capabilities show that the components are never independent from one another (Wisdom & Leavitt, 2015). We can activate some and not others, but in a broad context, such as our daily activities, all processes interact with each other. Thus, in the field of practical reasoning, we can find any possible form of inference. The procedures that we must follow in order to make the right decisions also require our reasoning processes, which allow us to achieve the desired results more effectively. When we solve a problem, we make use of both our reasoning processes and our ability to decide well. In short, there is no perfect 'recipe' that absolutely guarantees always finding the adequate solution to a problem, but critical thinking is the failsafe that protects us from looking at the world from behind a smokescreen of half-truths and distorted realities.

4. Research methods: Teaching approaches in Business Education

Business Education ensures that students have access to real-life situations involving companies and clients, as it provides the students with their first professional-type experiences, meant to prepare them for a future career in the world of business. Unlike traditional teaching methods that solely rely on providing theoretical information, which many times results in tedious and useless classes (Kohn, 2003), Business Communication in English captures the students' attention, because it allows them to partake in fun exercises − for instance, they can pretend to be company executives and make their own decisions as part of a business scenario, even if those decisions turn out to be wrong.

First and foremost, Business students need to understand that an excellent command of the English language is increasingly necessary for successful international communication, as it is linked to prospects of economic competitiveness and growth in the global economy.

The creation of new companies is undoubtedly one of the primary sources of sustained development throughout the world, both economically and socially. On the one hand, there is a positive and strong correlation between entrepreneurship and economic results in terms of growth, the survival of companies, innovation, job creation, technological change, increased productivity, and exports. Business initiatives − either in the context of the start-up of a new business or the reorientation of an existing one − are the engine of the market economy in the generation of wealth. On the other hand, entrepreneurship is also a means in the service of other social objectives, such as the generation of employment, the labor insertion of disadvantaged groups, the diversification of options for consumers and, ultimately, an increase in the quality of life of the community in which it is developed.

In recent years, various attempts have been made to come up with an operational definition of entrepreneurship. Oftentimes, a limited view of the construct is maintained, which is incorrectly defined exclusively in relation to the creation of companies and self-employment. However, it should mean much more than that, since it is linked to a broad concept of essential skills for life. Entrepreneurship includes creativity, innovation, and the ability to take calculated risks, as well as the capacity to plan and manage projects aimed at achieving different objectives. All these competencies are transferable and multifunctional and, therefore, important to meet the individual needs of personal development, social inclusion, and employment.

From this point of view, entrepreneurship is, above all, a question of attitude, which reflects the motivation and ability of a person to identify and take advantage of new opportunities to produce value or business success. Thus, business competencies can be useful to any person and type of business. That is, they can be present in both entrepreneurs and employees, as well as in companies of any sector and size, in the different stages of their life cycle, from before their creation to the phase of growth, transfer or closure, and new start-up.

In short, the benefit of an education in entrepreneurship is not (or should not be) limited to learning how to own more companies, be more innovative, and create more jobs. It is a key factor in becoming more creative, acquiring more confidence in what one does, and acting in a socially responsible manner. There is broad consensus regarding the need to include the education in entrepreneurial skills through lifelong learning, integrating it into the systems of regulated education, from kindergarten all the way to university and beyond.

Based on a broad concept of entrepreneurship, business skills education can be defined based on two elements:

1. education in competencies and business skills directed to the development of specific personal qualities and not directly focused on the creation of new companies,
2. specialized training aimed at the establishment of a company.

As such, Business Education in a Foreign Language should operate on the following levels:

a) promote the development of personal qualities related to entrepreneurship, such as creativity, initiative, risk-taking, and responsibility,

b) provide students with early knowledge of the business world and a credible interaction with it, by helping them understand the role of entrepreneurs in the community,

c) raise awareness among students about self-employment as a possible professional option (the message would be that, in addition to being employed, one can also become an entrepreneur, simultaneously or in the long run),

d) organize activities based on learning through practice (learning by doing) − for instance, by directing mini-companies or virtual companies as part of a classroom role-playing exercise or end-of-the-semester project,

e) provide students with specific training on how to start a business and manage its growth.

5. Findings: a few strategies and guidelines for educational success

The use of effective methodologies and activities for the teaching of entrepreneurship has long constituted a point of critical reflection on European and national policies and curricula. In general terms, it is assumed that the learning of basic skills and specific knowledge for the creation of new companies requires different teaching strategies complementing each other.

The following are a few useful strategies for the selection of entrepreneurship education methodologies when it comes to university-level classes of Business Communication in English:

i. *Theory-based methods should not be used excessively.* There is consensus regarding the importance of not limiting Business Education to the teaching of purely theoretical information, although much of the knowledge that the students acquire on the creation and operation of companies must be grounded in theory. Lectures as a primary teaching tool must be complemented with a wide range of more effective methodologies.

ii. *Autonomous forms of learning should be developed.* It is crucial to encourage an active attitude in the student, through educational methods that allow greater control over their own learning process. In this context, the adoption of a secondary role by the teacher, as a moderator of learning rather than a content provider, is crucial.

iii. *Learning based on direct action and practice by the student should be promoted more.* In relation to the previous point, the best way to learn about entrepreneurship is to practice it in a concrete way. Innovation and efficiency are mainly the result of action-oriented teaching methods based on student participation, which encourage students to understand the most theoretical aspects and encourage an active attitude in the learning process. Thus, in the teaching of business skills, there must be a balance between theoretical studies and the vital component of learning through practice.

iv. *Learning opportunities based on experience should be provided.* The involvement of the outside world in education is a strategy highly valued by students. That is why it is widely recommended that companies and employers participate more, while a more widespread application of methods based on case studies and specific projects is also encouraged. In this way, business skills are presented as a logical continuation of theoretical studies, rather than a mere extension that runs parallel to them.

v. *Cooperative learning and interaction should be enabled.* The overcoming delimitations between disciplines and multidisciplinary collaboration are essential elements for the acquisition of entrepreneurial skills. This method entails allowing students from different schools and fields of study to cooperate towards the development of joint activities and projects. Thus, greater use can be made of the individual skills of students with different academic backgrounds, in a context of continuous learning and mutual collaboration for the identification and fulfillment of new opportunities.

vi. *The role of reinforcement should not be underestimated.* Finally, it is important to recognize and encourage those students who are really interested in undertaking their own business projects, especially by reinforcing the values of accountability and innovation in the company (Sutton, 2002). In this sense, organizing competitions and awarding prizes to the students' most innovative projects can be a positive reinforcement strategy.

Based on these six basic methodological guidelines, the activities most useful in the teaching of business culture and entrepreneurial initiative are the following:

A. group activities and teamwork for the conception of new commercial ideas,

B. workshops involving business plans that allow for the maximum development of the students' innovative ideas,

C. case studies, which present students with models of behavior with which they can easily identify,

D. outside lecturers, especially businesspeople and business professionals (both entrepreneurs and corporate types),

E. company-centric simulations, for a better understanding of various enterprises' internal dynamics and ways of operating.

6. Conclusions

When planning a course or preparing for a specific class, Business English professors must be aware of all the options and limitations that derive from the institution's − and the students' − expectations of said course/class. The trick is managing to strike a balance between all the factors involved in each course. Thus, faculty must consider the variety of situations and tasks that the students of English for Specific Purposes should or might wish to carry out, together with their rhetorical/verbal needs, linguistic insights (grammar, vocabulary, etc.), and communication skills.

Ultimately, teaching Business Communication in English should be about adequately balancing all the factors that play a pertinent role in the design of the course and then taking two key steps, as follows: on the one hand, a relevant selection must be made considering the time available, the importance of the communicative needs detected, and the frequency of specific structures in the variety of the course; on the other hand, it might be convenient to establish a progression consistent with the subject matter's degree of difficulty and commensurate with the communicative importance of each aspect tackled. Regarding the linguistic aspects of Business English, grammar has long been an essential part of most language teaching programs, with grammatical errors or difficulties threatening to interfere with the students' productivity and communication effectiveness (Dudley-Evans & St John, 1998). However, in light of all the issues explored in the present paper, it can be judiciously inferred that the teaching of Business English has less to do with grammar and a lot more to do with critical thinking, entrepreneurial education, and a certain understanding of global issues that, for lack of a better word, can be defined as cultural awareness.

In the process of adapting university-level teaching of Business Communication in English to the requirements of the global market today, it is essential to reconsider whether the transformations undertaken will allow an appropriate response to the social responsibilities frequently assigned to the public university.

In a saturated labor market, marked by instability and the burden of unrealistic demands regarding professional experience, it seems unlikely that the traditional role of the university as a trainer of paid professionals can meet the needs of students in terms of access to the business world and the labor market in general. And even if it were, the fast-changing and ever-growing requirements of the business environment pose important challenges to the manner in which we choose to teach prospective entrepreneurs in the context of higher education − which means an innovation of teaching methodologies is long overdue.

References

[1] Bain, K. (2012). *What the best college students do*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.

[2] Dudley-Evans, T., & St, J. M.-J. (2011). *Developments in ESP: A multi-disciplinary approach*. Cambridge, U.K: Cambridge University Press.

[3] Davies, M., & Barnett, R. (2017). *The Palgrave handbook of critical thinking in higher education*.

[4] Kohn, A. (2003). *The schools our children deserve: Moving beyond traditional classrooms and "tougher standards."* Boston, Massachusetts: Houghton Mifflin Co.

[5] Ogle, D., Klemp, R. M., & McBride, B. (2007). *Building literacy in social studies: Strategies for improving comprehension and critical thinking*. Alexandria, Va: ASCD, Association for Supervision and Curriculum Development.

[6] Organisation for Economic Cooperation and Development (OECD) (France). (2014). *PISA 2012 Technical Report*. OECD Publishing. 2, rue Andre Pascal, F-75775 Paris Cedex 16, France. Tel: +33-145-24-8200, Fax: +33-145-24-8500, Web site: http://www.oecd.org.

[7] Prensky, M. (2012). *From digital natives to digital wisdom: Hopeful essays for 21st century learning*. Thousand Oaks, Calif: Corwin.

[8] Sobkowiak, P. (2008). *Issues in ESP: Designing a model for teaching English for business purposes*. Poznań: Wydawn. Nauk. Uniwersytetu im. Adama Mickiewicza.

[9] Sutton, R. I. (2002). *Weird ideas that work: 11 practices for promoting, managing, and sustaining innovation*. New York: The Free Press.

[10] United Nations. (2019). *Digital Economy Report*. https://unctad.org/en/Publications Library/der2019_en.pdf?user=46.

[11] Warschauer, M. (2010). *Technology and Social Inclusion: Rethinking the Digital Divide*. Cambridge: MIT Press.

[12] Wisdom, S., & Leavitt, L. (2015). *Handbook of research on advancing critical thinking in higher education*.

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Predictors of Financial Advice: An Evidence from a Developing Nation

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Abstract

The financial markets and products become increasingly complicated day by day, and the current pandemic is adding fuel to the fire, causing volatilities in the financial markets around the globe and a tough time to the individuals. To make better financial decisions, one needs sufficient level of financial literacy, but past studies revealed that most countries have below-average financial literacy, and it takes a long time to improve it. So, in such a scenario, financial advice is a quick way for individuals to make a better financial decision. It can be an easy and quick substitute for financial literacy in the short run. Therefore, considering the usefulness of financial advice, this paper investigates the direct effect of demographic (gender and education), financial anxiety, financial capability, financial satisfaction, and online transaction use on financial advice. The main objective of the paper is to understand the determinants of financial advice. The study is conducted in the northern part of India, collecting data through a self-reporting scale from individuals above 18. The paper applied hierarchical multiple regression with three steps in order to find the effects on financial advice. The findings indicate that financial advice is affected by financial anxiety, financial satisfaction, and online transaction use. Gender and education failed to reflect a significant effect on financial advice. Hence, this paper strengthens the existing literature of financial advice through the integrated framework, considering how an individuals' financial anxiety, financial capability, financial satisfaction, and online transaction use (being a part of digital financial literacy) drive individuals' financial advice-seeking behaviour. The novelty of the paper is the integrated framework itself, as the chosen variables combined on the individuals' financial advice are not explored yet.

Keywords: Financial anxiety, financial capability, financial satisfaction, online transaction use, Developing nation, India.

JEL Classification: D14, I31, L81

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1. Introduction

Stock market volatility & the risk associated with it has always been a cause of concern for the investors globally. Meanwhile, in recent times the COVID-19 pandemic has done the work of adding fuel to the fire. Many of the researchers across the globe have called this as the black swan for the stock markets (Morales & Callaghan, 2020). Such turbulent times have therefore further enhanced the requirement of an adequate level of financial literacy in order to avoid the losses and mechanisms to predict the risk (Dima & Vasilache, 2016). Moreover, the researchers in this area have well established that financial literacy around the globe is very widely distributed & the variations between the countries are very wide (Lusardi & Mitchell, 2011) ranging from 71 to 13% in many cases (Klapper, Lusardi, & van Oudheusden, 2015).

Therefore, in such a scenario where financial literacy is widely distributed and not much of the population around the globe can be called as adequately financially literate, proper financial advice becomes very critical for profitable investment (van Rooij, Lusardi, & Alessie, 2011). For selecting the correct financial product it is important that the individual is aware of the prevailing market circumstances (Braunstein & Welch, 2002). The researchers in the past have very well identified that in financial product choice the desired behaviour can be achieved through adequate & proper financial advice (Cwynar, Cwynar, Kowerski, Filipek, & Szuba, 2020). The feeling of anxiousness or uneasiness developing due to the fear of losing money is the main reason for financial anxiety (Cwynar et al., 2020). The studies in the past have identified that sometimes due to this uneasiness the person is not able to behave in the desirable manner, particularly in a decision situation, and shows a suboptimal behaviour (Lusardi & Tufano, 2015). This suboptimal behaviour adds to the chances of losing money. Some of the recent studies have shown a promising relationship between financial anxiety and financial advice seeking behaviour amongst individuals (Khan et al., 2020).

Financial capability can be better explained as how well the individual manages his resources in a given decision situation (Xiao & O'Neill, 2018). People with increased financial capability also depict efficient access to online resources and experts (Königsheim, Lukas, & Nöth, 2017). Financial capability is the ability to take calculated financial decisions (Lusardi & Mitchell, 2014). However, as per capability theory (Sen, 1993) along with ability, opportunity is also equally important. Financial advice may be acting as an opportunity to enhance financial knowledge and, thereby, financial capability (Busu, Vargas & Gherasim, 2020).

Financial satisfaction is one of the key ingredient to achieve overall life satisfaction (Woodyard & Robb, 2016), thus one can easily say that the state of being adequately satisfied in life cannot be achieved until and unless there is an element of financial satisfaction involved (Loewe, Bagherzadeh, Araya-Castillo, Thieme, & Batista-Foguet, 2014). There are many studies, which are conducted around the globe keeping the financial satisfaction as the basis (Bratianu, Prelipcean & Bejinaru, 2020) however; there is not much literature available with respect to the relationship between financial satisfaction & financial advice.

Online transaction use is the essence behind the development of new business models & availability of new financial services (Kousaridas, Parissis, & Apostolopoulos, 2008). The online transaction use is gaining popularity across the globe along with the expanding horizons of e-commerce (Kim, Tao, Shin, & Kim, 2010). In the past there were studies which emphasized that high internet usage on the part of users may also lead to access to online digital resources and online experts (van Rooij et al., 2011). However, the authors failed to find any conclusive literature, whereby an enquiry is made on how online transaction use leads to financial advice seeking behaviour on the part of the individuals.

2. Problem Statement

All financial decisions involve an element of risk of loss associated with them & this leads to distress amongst the individuals in a given decision situation (Cwynar et al., 2020). The sense of unrest in a given decision situation at times give rise to sub-optimal behaviour on the part of the individuals (Lusardi & Tufano, 2015). This sub-optimal behaviour becomes one of the main reason behind the financial losses as under rising level of anxiousness the performance is affected (Joo, Durband, & Grable, 2008). There are studies which conclude that this sub-optimal behaviour can be improved by imparting proper financial knowledge (Cwynar et al., 2020). Many researchers have argued that in order to achieve better results in a dynamic and fluctuating market, it is always better to seek financial advice (Stolper & Walter, 2017). However, the authors failed to find any conclusive literature, connecting financial anxiety to the financial advice seeking behaviour.

Hypothesis 1 (H1): *Financial Anxiety positively affects financial Advice*

Financial capability means the financial knowledge of an individual and the ability to depict better financial habits in any situation (Lin et al., 2016). The researchers in the past have argued that people who have better access to financial resources are much more financially capable (Sherraden, 2013). Many studies have also hinted that people who are financially capable are also very active on the digital platforms (Königsheim et al., 2017). Moreover, the studies done in the past have also revealed that those who perform higher online usage of digital platforms have access to online resources which includes online experts (van Rooij et al., 2011). Despite all these studies, authors failed to find enough conclusive evident based literature to establish a clear relation between financial capability and financial advice seeking behaviour on the part of the individuals.

Hypothesis 2 (H2): *Financial Capability positively affects financial Advice*

Financial satisfaction comes along with the overall satisfaction with life (Michalos & Orlando, 2017). Many of the researchers in the past have established a relationship between financial satisfaction & financial capability (Xiao & Porto, 2016). The studies carried out in the field have revealed that people who are financially capable have better exposure to digital resources (Königsheim et al.,

2017). Thus, one can say that better financial capability leads to better financial satisfaction, but since financial capability may be affected by financial advice there can be a relationship between financial satisfaction and financial advice. Hence, the next research hypotheses are developed as;

Hypothesis 3 (H3): *Financial Satisfaction positively affects financial Advice*

As the click and conquer model of electronic commerce gains popularity amongst the public, along with it the online transaction use is also increasing day by day (Kousaridas et al., 2008). Online transactions are the life blood on which the electronic commerce survives (Kim et al., 2010). Over a period of time researchers have also established that online transactions are not only quick but are also equally safe and reliable (Prochnow, 2007). In the absence of conclusive literature on the impact of online transaction use on financial advice seeking behaviour amongst the individuals. Thus, the next hypotheses are framed as;

Hypothesis 4 (H4): *Online transaction use positively affects financial Advice*

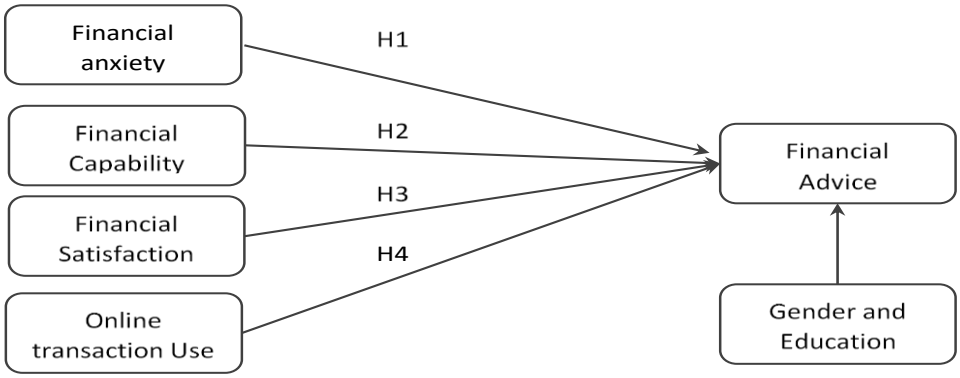

Fig. 1 – Theoretical model

3. Aims, research methods and data

The aim of the study is to investigate the determinants of financial advice.

The study was conducted over the recent graduates working and residing in the northern states of India. It took two months from January to February 2020 for data collection, as the restrictions imposed due to COVID-19 & the fear amongst the people affected further data collection. The study followed stratified sampling techniques at chosen capital cities from the four states in northern India, including national capital Delhi and its neighbouring states Uttar Pradesh, Rajasthan, and Haryana. As the target respondents were recent graduates, authors contacted universities' alumni database in order to reach the respondents. From all the states in northern India, the four most populous states were chosen as a stratum, then from each chosen state, their capital cities were identified. Thereafter, the study selected

one private institute from each states' capital city, which provides courses in the five streams such as business management, information technology, pharma, computer science, and engineering. The list of students from alumni databases in the streams of business management, information technology, pharma, computer science, and engineering background were classified into different strata once again and then every third alumni was contacted. Fifty alumni were contacted from each stream which sets the sample target of 250 questionnaires. This process helped the authors reach the defined respondents, and responses were collected through an online google form. The study focused on recent graduates due to their substantial weight in the Indian population, as more than a quarter of the Indian population falls under this bracket.

According to Ministry of Human Resource Development (Ministry of Human Resource Development, 2016) there are 799 Universities, 39071 colleges and 11923 Stand Alone Institutions in India. Total enrolment in higher education has been estimated to 34.6 million in the year 2015-16. A pilot test from 40 samples was conducted to check and get the satisfactory responses of the questionnaire, after satisfactory Cronbach alpha, validity, and reliability, and the study finally managed to get a total of 166 questionnaires excluding the sample used in the pilot study. The study initially targeted 250 samples; however, the response rate was of 66.4 percent, therefore the authors managed to collect 166 questionnaires, but covid-19 lockdown affected further collection of data. Though the study reflects small sample size , it can still be analysed following the commonly use rule of thumb for sample size at 95%, encouraged from other studies which either used small sample size or reflect small sample size can be used (Bujang, Sa'at, & Sidik, 2017; Çera & Tuzi, 2019; Green, 1991).

The study intended to test at 5% level of significance. Looking into the respondents' profiles, the ratio of females and males is almost the same, 49.8 and 50.2 percent, respectively. Approximately 70.7 percent have bachelor's degrees, and the rest 29.3 percent have a post-graduate either degree or diploma or certificate.

Variable measurement

To examine the formulated hypotheses, the study used self-evaluated statements based on the 5-point Likert scale (1=strongly disagree to 5=strongly agree), as shown in Table 1. The questionnaire was divided into five sections. The designed questionnaire used questions from the national financial capability study (NFCS, 2012) for financial advice and financial capability. To measure the EPS use items were adopted from (Kim et al., 2010). Financial anxiety scales were adopted from (Archuleta, Dale, & Spann, 2013). Financial satisfaction items were adopted from the Chuan *et al.*'s (Chuan, Kok, & Chen, 2012) scale.

Table 1. Variable Measurement

FD1	I think financial advice is helpful	NFCS (FINRA, 2012)
FD2	I consider others' opinions in decision-making (buying, investing, savings, borrowings, etc.)	
FD3	Consultation is important in dealing with financial issues	
FD4	I seek professional financial advice/advisor	
FD5	I think financial advice will help me to achieve financial expectations in better way	
FD6	I would trust financial professionals and accept what they recommend	
FX1	I feel anxious about my financial situation	Archuleta, 2013
FX2	I have difficulty concentrating on my school/or work because of my financial situation.	
FX3	I have difficulty-controlling worrying about my financial situation.	
FX4	I have difficulty sleeping because of my financial situation	
FX5	I feel fatigued because I worry about my financial situation.	
FC1	I can arrange at least 150,000 INR in an unexpected need arose within the next month	NFCS (FINRA, 2012)
FC2	I have enough funds to survive for three months without regular earnings	
FC3	I often use electronic payment mode for paying bills through (credit card, debit card, etc)	
FC4	I am good at dealing with day-to-day financial matters, such as checking accounts.	
FC4	I have too much debt right now	
FS1	Your current saved money.	Chuan et al.'s (2012)
FS2	Your current preparedness to meet emergencies?	
FS3	Your current financial situation?	
FS4	Your financial convenience and financial health?	
FS5	Your current financial management skills?	
FS6	In the last months, I have been able to save money as much as I have wished.	
EPS1	I perceive Electronic payment system is secure	Kim et.al., 2010
EPS	I trust parties involve in online transactions such as buyer seller etc.	
EPS3	I trust the security mechanisms of Electronic payment system	
EPS4	I have started using online transaction and payment	
EPS5	I have started using online transactions long time ago	
EPS6	I use electronic payment system more often than others	
EPS7	I am currently using electronic payment system and will continue to use it.	
EPS4	I do not fear hacker invasions into Electronic payment system	

Method

A hierarchical multiple regression with three steps was performed with an objective to test the effect of financial anxiety, financial capability, financial satisfaction, and online transaction use along with demographic variables (gender and education) on financial advice. The hierarchical multiple regression method was applied because it tests the significance of inclusion into the analysis sets of variables in different blocks. The first block consists of demographic gender and education. The second step (block of variables) includes financial anxiety and financial capability variables. In the third block, along with demographic, financial anxiety, the financial capability, financial satisfaction, and online transaction use were included. With this process, this kind of regression can reveal the contribution of each set of variables with respect to the dependent variable (Pallant, 2016). The dependent variable was financial anxiety. The data were analysed through SPSS 23 version (Meyers, Gamst, & Guarion, 2013).

Its mathematical form can be written as:

(1) $$fin\_Advice = \widehat{\beta_0 + \beta_1 gender + \beta_2 education}$$

(2) $$fin\_Advice = \widehat{\begin{matrix}\beta_0 + \beta_1 gender + \beta_2 education + \beta_3 financial\ anxiety + \\ \beta_4 financial\ capability\end{matrix}}$$

(3) $$fin\_Advice = \widehat{\begin{matrix}\beta_0 + \beta_1 gender + \beta_2 education + \beta_3 financal\ anxiety \\ +\beta_4 financial\ satisfaction \\ +\beta_5 fin\ capability\ + \beta_6 online\ transaction\ usage\end{matrix}}$$

4. Findings

The application of hierarchical linear regression on the framed hypotheses revealed the results in the following steps. Basic statistics and analysis of variance are presented in Table 2 and 3. In Step one which consist of independent demographic factors such as gender and education explained -0.4% of the financial advice coefficient of determination, F (2,163) =.667, p >.001. In the step two, other variables such as financial anxiety and financial capability were included, the coefficient of determination in the second step together with demographic factors found 21.4%, F (4,161) = 12.246, p<.001. In the step three, another two variables were added financial satisfaction and online transaction use, along with the existing variables in the step one and two. The total coefficient of determination explicated by the model was 33.2%, F (6,159) =13.161, P<.001.

The two variables, financial anxiety and financial capability, added in step two explained an additional 22.5 percent of the coefficient of determination in financial advice, after controlling the demographic variables, R squared

change= .225, F change (2, 161) =23.640, p<.001. This explains a considerable increase in the explicated coefficient of determination on the dependent variable, which reveals the significance of financial anxiety and individual's financial capability in explaining financial advice. Similarly, two other variables financial satisfaction and online transaction use (part of financial inclusion) explained an additional 9.9% of the coefficient of determination in the financial advice, after controlling previous steps variables, R squared change= .099%, F change (2, 159) =11.728, p<.001. This considerable increase in the explained coefficient of determination in the dependent variable financial advice proves the importance of financial satisfaction and online transaction use in explaining financial advice seeking behaviour.

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.090[a]	.008	-.004	4.50378	.008	.667	2	163	.514
2	.483[b]	.233	.214	3.98426	.225	23.640	2	161	.000
3	.576[c]	.332	.307	3.74267	.099	11.728	2	159	.000

Predictors: (Constant), ED, GD
Predictors: (Constant), ED, GD, FCAP, FAXY
Predictors: (Constant), ED, GD, FCAP, FAXY, FSAT, OLIN

Table 3. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.072	2	13.536	.667	.514[b]
	Residual	3306.301	163	20.284		
	Total	3333.373	165			
2	Regression	777.609	4	194.402	12.246	.000[c]
	Residual	2555.764	161	15.874		
	Total	3333.373	165			
3	Regression	1106.163	6	184.361	13.161	.000[d]
	Residual	2227.210	159	14.008		
	Total	3333.373	165			

Dependent Variable: FADV
Predictors: (Constant), ED, GD
Predictors: (Constant), ED, GD, FCAP, FAXY
Predictors: (Constant), ED, GD, FCAP, FAXY, FSAT, OLIN

Table 4 explains the outcomes of the effects of each independent variable on financial advice. Viewing the outcomes stepwise, in the first block of variables, both demographic variables, genderβ = .087, t = 1.113, p> .10 and education β = .020, t = .262, p> .10 were found insignificant in predicting individual's financial advice seeking behaviour. Therefore, gender and education are not an important predictor of individuals' financial advice in the first block.

In the second block of variables, two new variables, financial anxiety and financial capability, were added along with demographic variables,. Interestingly, in the second step, gender becomes significant predictor of financial advice β = .146, t = 2.092, p< .05, but the education β = -.007, t = -.096, p> .10. is still insignificant with the second block of variables as well. Further analysis revealed that financial anxiety positively influences financial advice β = .354, t = 5.049, p< .001, supporting H1. A positive relationship was also reported between financial capability and financial advice, β = .299, t = 4.279, p< .001, hence, supporting H2 as well.

In the third and final step of the regression, financial satisfaction and online transaction use were added with the existing variables of the second block. Financial anxiety β = .290, t = 4.226, p< .001, financial satisfaction β = .218, t = 3.001, p< .001, online transaction use β = .211, t = 2.688, p< .001 were found significant predictor of financial advice, hence supports H1, H3 and H4. The effect of financial capability on financial advice was found at the edge of acceptance as an important variable, β = .141, t = 1.909, p = .058, hence, the H2 was technically rejected but not strongly. Similarly, gender was also found at the edge β = .124, t = 1.884, p = .061 but education β = -.038, t = -.574, p = .567 is still insignificant thus, it is a not a vital predictor of financial advice seeking behaviour.

Table 4. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	17.732	3.139		5.649	.000		
	GD	.779	.700	.087	1.113	.267	.998	1.002
	ED	.175	.669	.020	.262	.793	.998	1.002
2	(Constant)	9.177	3.114		2.947	.004		
	GD	1.306	.624	.146	2.092	.038	.981	1.019
	ED	-.057	.600	-.007	-.096	.924	.971	1.030
	FAXY	.405	.080	.354	5.049	.000	.971	1.030
	FCAP	.398	.093	.299	4.279	.000	.974	1.026
3	(Constant)	6.853	2.965		2.312	.022		
	GD	1.108	.588	.124	1.884	.061	.976	1.025
	ED	-.326	.567	-.038	-.574	.567	.958	1.044
	FAXY	.332	.079	.290	4.226	.000	.893	1.119
	FCAP	.187	.098	.141	1.909	.058	.773	1.293
	FSAT	.196	.065	.218	3.001	.003	.799	1.252
	OLIN	.162	.060	.211	2.688	.008	.680	1.471

a. Dependent Variable: FADV

Regarding the assumption dealing with multicollinearity, the hierarchical multiple regression assesses two statistics: tolerance and variance inflation factor (VIF). Enough indication was found supporting its absence in all the steps of the model since among all VIF values, there was no value above the conservative threshold (value of 3) (see Table 4). On the other hand, the tolerance standards for each variable were also testified and all the values higher than the minimum criteria of .10 (Pallant, 2016) found. These findings highlighted that the multicollinearity assumption was not violated. Since the values of Variance Inflection Factors (VIF) from Table 4 are under 5 for all variables in all 3 Models, then there are no collinearity problems among the independent variables.

5. Discussion

The present study focused on how financial anxiety, financial capability, financial satisfaction and online transaction use affect individuals' financial advice-seeking behaviour in the context of a developing country. The outcomes of the analysis indicate that the financial anxiety is a significant factor affecting financial advice, this finding being somewhat similar with the study which covered the impact of financial stress on financial help-seeking behaviour (Grable & Joo, 1999; Lim, Heckman, Letkiewicz, & Montalto, 2014). This study found the effect of financial capability at the edge of acceptance; therefore, it cannot be concluded strongly that financial capability does not affect financial advice. Peeping into the previous studies, it was found that financial literacy, which is a major component of financial capability, affects financial advice-seeking behaviour (Nguyen & Rozsa, 2019). In the context of India, a study found financial attitude and financial behaviour, which are the components of financial capability (Johnson & Sherraden, 2007) are positive and significant for financial advice seeking behaviour (Chauhan & Dey, 2020). Similarly, a study in China also found that financial advice is concentrated in high financial literacy households and indicated that the reason behind low performance of financial advice is the poor level of financial literacy, it shows the influence of financial literacy on financial advice seeking, and that financial literacy reflects an internal ability which is part of the financial capability (Johnson & Sherraden, 2007; Pan, Wu, & Zhang, 2020). This explains that improved financial literacy among individuals can improve the use of financial advice.

Similarly, financial satisfaction was also found as a significant positive factor affecting financial advice-seeking behaviour and this outcome goes in line with (Cliff, Babiarz, & Woodyard, 2012). Previous studies covered how financial inclusion has a relation with financial advice, with digital financial inclusion being a part of financial inclusion, as a study found that automated digital services offer advice and financial planning services (Pazarbasioglu et al., 2020). The examination of the impact of online transaction use on financial advice seeking behaviour was found positively significant. It means financial inclusion and financial advice are positively related, and the present finding depict the same effect. Moreover, India is among the top three along with USA and China in terms of highest number of users of internet and smartphone. This ultimately gives an easy platform for online

payment and transactions and the connection with online financial institutions might take towards online financial advice. Even in this regard, financial entities and regulators are concentrating on the consumer centric approach in order to understand the consumer better through digital financial advice models (Diederick Van Thiel & Fred Van Raaij, 2017). Therefore, the present study also supports the existing literature in this regard.

Moreover, among demographic factors, gender was found to a certain extent important in predicting individuals' financial advice-seeking behaviour, unlike education, which does not have a significant impact on individuals' financial advice-seeking behaviour. Upon analysis, gender was found insignificant in step one and three of the analysis, but significant in step two. This mixed results may be due to the fact that traditionally, men were the major financial advice-seekers, but the changing trend shows that women are now substantially participative in earning, planning and investments (Cuna, 2017). A recent study in the context of India supported that the differences between males and females about financial advice is gradually reducing (Khan et al., 2020). The justification for choosing the recent graduates is that they constitute the youngest generation among the workforce, part of the latest education system and overall the biggest part of the population from a country that has one of the largest young population.

The study was conducted in India due to several reasons, firstly, very few studies have investigated what affects financial advice in the context of India. Secondly, since India is a developing country and the majority of the countries in the world are developing, the outcomes of the study may have a limitation due to its small sample size which may not allow one generalize. But still the results might be able to attract the researchers in other developing nations. Based on the Hofstede & Minkov (2010), India is also a collective society which reflects that individuals' actions are influenced by the opinions of family members, neighbours and other social networks, and in that scenario, financial advice from others can play a crucial role in the Indian context and can be related to other collective societies.

Despite having small sample size indeed, this paper adds new variables affecting financial advice-seeking behaviour, and most of the framed hypotheses have positive outcome, measuring the effect of being financially capable and financially satisfied with financial advice-seeking behaviour which is not explored enough yet. The findings reveal that an individual who is financially capable, satisfied, and anxious has a positive affect on financial advice-seeking behaviour.

6. Conclusions

The goal of the study was to examine the predictors of financial advice among the individuals of a developing country like India. The study focused on investigating financial advice because the importance of financial advice is constantly increasing (Moreland, 2018; Stolper & Walter, 2017). Therefore, in this context, the present study offers insight regarding the important factors that influence financial advice, factors which are not yet covered much in the existing literature.

The findings of the paper give vital insights for both knowledge addition as well as for practical implications. The first contribution of the study is related to factors such as financial capability and financial satisfaction as a determinant of financial advice was not studied yet. Secondly, it measures the chosen combination of factors affecting financial advice, which was also not covered comprehensively in the existing literature along with key demographic variables such as gender and education. The weak result of financial capability can be overcome through further research. In the Indian context, financial anxiety, financial satisfaction, online transaction use are the key factors that are affecting financial advice-seeking behaviour. As the world is moving towards inequality reduction, this could be a positive sign that gender does not affect financial advice (World Economic Forum, 2019).

Considering the output of the present study, which is stressing out that financial anxiety, capability, satisfaction, and online transaction usage, it can increase financial advice-seeking behaviour positively. The results can be useful for framing policies with the primary purpose of enhancing financial advice-seeking behaviour for better financial investment and safety and risk-return preferences in the context of the developing country.

Even though the purpose of the study was fulfilled, some limitations regarding the generalization of its outcomes still exist. Though examination revealed significant relationships in India's context, it can still not be generalized to other countries. Advanced research is encouraged in order to apply other methods such as nonparametric ones or structural equation modelling.

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References

[1] Archuleta, K. L., Dale, A., & Spann, S. M. (2013). Financial Satisfaction, and Financial Anxiety. *Journal of Financial Counseling and Planning*, 24(2), pp. 50-62. Retrieved from http://hdl.handle.net/2097/17281.

[2] Bratianu, C., Prelipcean, G., and Bejinaru, R. (2020), Exploring the latent variables which support SMEs to become learning organizations, *Management & Marketing. Challenges for the Knowledge Society*, 15(2), pp. 154-171. DOI: 10.2478/mmcks-2020-0010.

[3] Braunstein, S., & Welch, C. (2002). Financial literacy: An overview of practice, research, and policy. *Federal Reserve Bulletin*, 88(11), pp. 445-457.

[4] Bujang, M. A., Sa'at, N., & Sidik, T. M. I. T. A. B. (2017). Determination of minimum sample size requirement for multiple linear regression and analysis of covariance based on experimental and non-experimental studies. *Epidemiology Biostatistics and Public Health*, 14(3), e12117-1-e12117-9. https://doi.org/10.2427/12117.

[5] Busu, M., Vargas, M. V., Gherasim, I. A. (2020). An analysis of the economic performances of the retail companies in Romania, *Management & Marketing. Challenges*

for the Knowledge Society, 15(1), pp. 125-133, DOI: 10.2478/mmcks-2020-0008.

[6] Çera, G., & Tuzi, B. (2019). Does gender matter in financial literacy? A case study of young people in Tirana. *Scientific Papers of the University of Pardubice, Series D*, 45(1), pp. 5-16.

[7] Chauhan, Y., & Dey, D. K. (2020). Does financial literacy affect the value of financial advice? A contingent valuation approach. *Journal of Behavioral and Experimental Finance*, 25, 100268. https://doi.org/10.1016/j.jbef.2020.100268.

[8] Chuan, C. S., Kok, N. K., & Chen, O. B. (2012). Financial Satisfaction and Intergenerational Resource Transfers among Urban Older Malaysians. *American Journal of Scientific Research*, 43(43), pp. 32-45.

[9] Cliff, A., Babiarz, P., & Woodyard, A. (2012). The demand for financial professionals ' advice : The role of financial ... *FINANCIAL SERVICES REVIEW*, 21, pp. 291-305.

[10] Cuna. (2017). *Insights | perspectives on wealth management | serving the female investor through all life stages*.

[11] Cwynar, A., Cwynar, W., Kowerski, M., Filipek, K., & Szuba, P. (2020). Debt literacy and debt advice-seeking behaviour among Facebook users: the role of social networks. *Baltic Journal of Economics*, 20(1), pp. 1-33. https://doi.org/10.1080/1406099x.2019.1693142.

[12] Diederick Van Thiel, & Fred Van Raaij. (2017). Explaining Customer Experience of Digital Financial Advice. *Economics World*, 5(1), pp. 69-84. https://doi.org/10.17265/2328-7144/2017.01.007.

[13] Dima, A. M., Vasilache, S. (2016). Credit risk modeling for companies default prediction using neural networks, *Romanian Journal of Economic Forecasting*, 19(3), pp. 127-143.

[14] Grable, J. E., & Joo, S. (1999). Financial help-seeking behavior : Theory and implications Financial Help-Seeking Behavior : Theory And Implications. *Journal of Financial Counseling and Planning*, 10(01), pp. 14-25.

[15] Green, S. B. (1991). How Many Subjects Does It Take To Do A Regression Analysis? *Multivariate Behavioral Research*, 26(3), pp. 499-510. https://doi.org/10.1207/s15327906mbr2603_7.

[16] Hofstede, G., & Minkov, M. (2010). Cultures and Organizations. In *McGraw Hill*. https://doi.org/10.1007/s11569-007-0005-8.

[17] Johnson, E., & Sherraden, M. S. (2007). From Financial Literacy to Financial Capability Among Youth. *The Journal of Sociology & Social Welfare*, 34(3), pp. 119-147.

[18] Joo, S. H., Durband, D. B., & Grable, J. (2008). The academic impact of financial stress on college students. *Journal of College Student Retention: Research, Theory and Practice*, 10(3), pp. 287-305. https://doi.org/10.2190/CS.10.3.c

[19] Khan, K. A., Akhtar, M. A., Dey, S. K., & Ibrahim, R. (2020). Financial Anxiety, Financial advice, and E-payment use: Relationship and perceived differences between males & females of Generation Z. *Journal of Critical Reviews*, *7*(18), pp. 1812-1820.

[20] Kim, C., Tao, W., Shin, N., & Kim, K. S. (2010). An empirical study of customers' perceptions of security and trust in e-payment systems. *Electronic Commerce Research and Applications*, 9(1), pp. 84-95. https://doi.org/10.1016/j.elerap.2009.04.014.

[21] Klapper, L., Lusardi, A., & van Oudheusden, P. (2015). Financial literacy around the world: Insights from the Standard & Poor'S ratings Services Global Financial Literacy Survey. In *World Bank*. Retrieved from http://www.openfininc.org/wp-content/uploads/

2016/04/2015-Finlit_paper_17_F3_SINGLES.pdf.

[22] Königsheim, C., Lukas, M., & Nöth, M. (2017). Financial Knowledge, Risk Preferences, and the Demand for Digital Financial Services. *Schmalenbach Business Review*, 18, pp. 343-375. https://doi.org/10.1007/s41464-017-0040-0.

[23] Kousaridas, A., Parissis, G., & Apostolopoulos, T. (2008). An open financial services architecture based on the use of intelligent mobile devices. *Electronic Commerce Research and Applications*, 7(2), pp. 232-246. https://doi.org/10.1016/j.elerap.2007.04.003.

[24] Lim, H. N., Heckman, S. J., Letkiewicz, J. C., & Montalto, C. P. (2014). Financial stress, self-efficacy, and financial help-seeking behavior of college students. *Journal of Financial Counseling and Planning*, 25(2), pp. 148-160.

[25] Lin, J. T., Bumcrot C., Ulicny T., Lusardi A., Mottola G., Kieffer C., & Walsh G. (2016). *Financial Capability in the United States 2016*.

[26] Loewe, N., Bagherzadeh, M., Araya-Castillo, L., Thieme, C., & Batista-Foguet, J. M. (2014). Life domain satisfactions as predictors of overall life satisfaction among workers: Evidence from Chile. *Social Indicators Research*, 118(1), pp. 71–86. https://doi.org/10.1007/s11205-013-0408-6.

[27] Lusardi, A., & Mitchell, O. S. (2011). Financial literacy around the world: An overview. In *Journal of Pension Economics and Finance*, 10. https://doi.org/10.1017/S1474747211000448.

[28] Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), pp. 5-44. https://doi.org/10.1257/jel.52.1.5.

[29] Lusardi, A., & Tufano, P. (2015). Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics and Finance*, 14(4), pp. 332-368. https://doi.org/10.1017/S1474747215000232.

[30] Meyers, L. S., Gamst, G. C., & Guarion, A. J. (2013). *Performing data analysis using IBM SPSS*. New Jersey: Wiley.

[31] Michalos, A. C., & Orlando, J. A. (2017). A note on student quality of life. *Connecting the Quality of Life Theory to Health, Well-Being and Education: The Selected Works of Alex C. Michalos*, pp. 247-254. https://doi.org/10.1007/978-3-319-51161-0_10.

[32] Ministry of Human Resource Development, G. of I. (2016). *All India Survey on Higher Education (2015-16)*. New Delhi.

[33] Morales, L., & Callaghan, B. A. (2020). Covid19 : Global Stock Markets " Black Swan " Critical Letters in Economics & Finance Covid-19 - Global Stock Markets " Black Swan ." *Critical Letters in Economics & Finance*, 1(1), pp. 0-14.

[34] Moreland, K. A. (2018). Seeking Financial Advice and Other Desirable Financial Behaviors. *Journal of Financial Counseling and Planning*, 29(2), pp. 198-206.

[35] NFCS. (2012). *2012 National Financial Capability Study State-by-State Survey Instrument*.

[36] Nguyen, T. A. N., & Rozsa, Z. (2019). Financial Literacy and Financial Advice Seeking for Retirement Investment Choice. *Journal of Competitiveness*, 11(1), pp. 70-83. https://doi.org/10.7441/joc.2019.01.05.

[37] Pallant, J. (2016). *SPSS survival manual: a step by step guide to data analysis using IBM SPSS* (6th ed.). New York, NY: McGraw-Hill Education.

[38] Pan, X., Wu, W., & Zhang, X. (2020). Is financial advice a cure-all or the icing on the cake for financial literacy? Evidence from financial market participation in China. *International Review of Financial Analysis*, 69(16), 101473. https://doi.org/10.1016/j.irfa.2020.101473.

[39] Pazarbasioglu, C., Mora, A. G., Uttamchandani, M., Natarajan, H., Feyen, E., & Saal, M. (2020). *Digital financial services,* April 2020.

[40] Prochnow, A. (2007). *B2B E-Payments*. 50(6), pp. 56-61.

[41] Sen, A. (1993). Capability and Well-Being. In M. Nussbaum & A. Sen (Eds.), *The Quality of Life*, pp. 30-53, USA: Oxford University Press.

[42] Sherraden, M. S. (2013). Building blocks of financial capability. In J. Birkenmaier, M. Sherraden, & J. Curley (Eds.), *Financial Capability and Asset Building: Research, Education, Policy, and Practice*, pp. 3-43, New York: Oxford University Press.

[43] Stolper, O. A., & Walter, A. (2017). Financial literacy, financial advice, and financial behavior. *Journal of Business Economics*, 87(5), pp. 581-643. https://doi.org/10.1007/s11573-017-0853-9.

[44] van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, 101(2), pp. 449-472. https://doi.org/10.1016/j.jfineco.2011.03.006.

[45] Woodyard, A. S., & Robb, C. A. (2016). Consideration of Financial Satisfaction: What Consumers Know, Feel and Do from a Financial Perspective. *Journal of Financial Therapy*, 7(2). https://doi.org/10.4148/1944-9771.1102.

[46] World Economic Forum. (2019). *Global Gender Gap Report 2020: Insight Report*. https://doi.org/10.1002/9781119085621.wbefs350.

[47] Xiao, J. J., & O'Neill, B. (2018). Propensity to plan, financial capability, and financial satisfaction. *International Journal of Consumer Studies*, 42(5), pp. 501-512. https://doi.org/10.1111/ijcs.12461.

[48] Xiao, J. J., & Porto, N. (2016). Which Financial Advice Topics Are Positively Associated with Financial Satisfaction ? *Journal of Financial Planning*, July, pp. 52-60.

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Innovative Educational Models to Revive the Education System after Pandemic Crises

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Abstract

After the social transformations imposed by the appearance of the COVID 19 virus and the pandemic that spread in the whole world, at the global level, besides imposing health safety measures, it was necessary to implicitly create innovative educational models which focus on new aspects of distance. social, as well as on the transition of all educational activities in the online environment, using methods and means of education different from those used in the educational act carried out face to face. This new approach to educational activity has led to the emergence of numerous educational models which, however, must be analysed and which must be selected according to the educational level and the educational requirements related to the demands on the labour market. With the help of statistical data presented by Eurostat, as well as through the analysis of the models presented in some webinars, we tried to find variants of innovative educational models which are achieved in the new conditions. The main challenge is to find the ideal educational model, able to restart the educational system according to the measures imposed by the global pandemic.

Keywords: educational models, innovation, education system, pandemic.

JEL Classification: A10, A20, D83, I15, I21

1. Introduction

At the end of 2019 and especially in the first two months of 2020 in China the SARS-COV-2 virus that radically changed the face of humanity, because it spread at a worrying rate across the planet and completely changed the way of life ordinary people, appeared. The onset of the pandemic has forced authorities around the world to impose health and social measures on the population in order to protect the population from the disease and to slow down the spread of the virus. Against the background of this situation, many of the companies sent their employees to work from home, others closed completely.

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In all countries of the world, the isolation of the population also determined the closure of schools, and the solution to continue education was to move the educational act online.

Education is one of the basic links of society and although it has no tangible results, materialized in finished products, in reality without education society is subject to collapse. The closure of schools has led to a forced decline in economic engines in all countries of the world, because the stay of children at home has also required the stay at home of at least one parent, thus causing disruption in all other areas of the economy.

Also, the dimensions of social inequities deepened with the installation of the pandemic, disadvantaged areas, subject to poverty located mainly in rural areas, becoming even poorer and the impact of students' staying home by closing schools caused students in most cases to break complete school. The transition to digital teaching has highlighted problems related to the lack of ICT training among both students and teachers, as well as the lack of internet connection and laptop, desktop, tablet, printer, and their number in families with several children whose parents also worked from home (Dumulescu, Balazsi, & Oprea, 2015).

What will be the next context? Certainly, for the return to school, in the next school year, additional hygiene measures will have to be ensured, social distance, wearing a mask will become a permanence, ensuring a framework with specialized medical training at the level of each school and especially in Romania, the numerical resizing of students in a class by organizing staff with a maximum of 10-15 students, constant groups of same students, thinking about line flows in schools, different breaks for students and rethinking school programs by carrying out educational activities in open spaces.

All these aspects will be easier to accomplish in countries with developed economies, with a modern school infrastructure, well-funded and with a more flexible education system. Less economically developed countries will encounter difficulties, as it happens in Romania where 30% of schools have unsanitary conditions with a toilet in the school yard and without being connected to running water, where the education system is always underfunded, schools curricula are rigid and not adapted to the needs of today's society, relying more on the transmission of information and less on the training of skills and competencies needed in the trades of the future (MEC, 2019).

2. Problem Statement

The biggest challenge for any educator is to build an ideal model of education (Aithal, & Shubhrajyotsna Aithal, 2015) that he/she can put into practice and whose result is beneficial for the long term for the student or teacher but especially for society as a whole. With the advent of the pandemic, education systems have undergone major transformations, as they have had to reinvent themselves and create or implement new models of education, models that can be developed without access to the traditional model of education developed face to face and rely more on technology, digitization and online education.

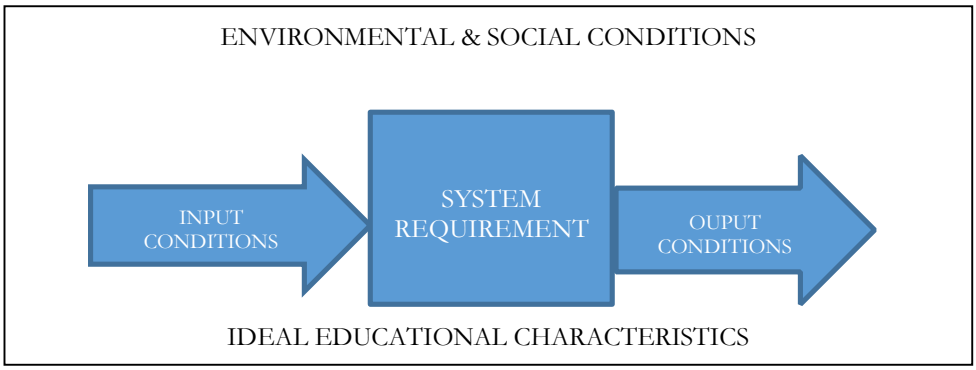

Figure 1. Classification of an Ideal Educational System Characteristics
Source: adapted from P. S. Aithal & P. Shubhrajyotsna Aithal (2015), p. 2464

When the transition to digitalized education is sudden, the system may not respond very well, errors may occur, or the desired quality may not be obtained, and from this point of view it is necessary for the development of new models of education to be achieved, to be developed by specialists and put it into practice by teachers after a serious training of their competencies.

Globally, it has been observed that where online education programs already exist, the respective institutions have quickly adapted to the new conditions of distance and isolation at home and have conducted online courses for all students, using online learning platforms. EU countries have taken a number of measures to connect teachers with students, to access platforms and information, to support the continued professional development of teachers, either by providing free online platforms, or by funding projects to support online learning for the next period.

The European Commission also initiates, coordinates and supplements the measures required to manage the coronavirus pandemic, and from this perspective digital technologies play a key role. Thus, the Action Plan for the digital age (European Comission, 2018), which aims to implement measures to help EU member states to meet the challenges of education in the digital age and to increase the opportunities offered by it was developed.

In Romania, as in all European countries, after the imposition of measures specific to the coronavirus pandemic and the transition to online education, steps were taken to carry out educational activities using digital tools and resources, which were familiar to many teachers, especially those from the large urban environment.

In recent decades, all government institutions represented by MEC, ISE have taken several steps in terms of digitizing the education system starting with SEI which represents the Computerized Education System, training programs for teachers on the use of new technologies, eTwinning action, and creating an open educational resource base, RED, or projects such as CRED or ROSE.

Despite all these attempts, the education system, in fully digitized form, as imposed by the pandemic, is far from functional, especially since not all teachers have competences specifically for computer-assisted instruction, the curriculum

requires changes for transposition into distance activities, technical educational solutions are not yet built for the realization of an education system developed entirely online.

Fred D. Davis's (1989) theory of acceptance of technology states that the criterion for choosing a technological solution is its ease of use, as perceived by those who intend to use it, rather than its usefulness. (Davis, 1989).

What is being tried in the field of education at the moment is to find digital models of education, an alternative to traditional education by implementing a technological pedagogy, as well as a smart education that corresponds to the new social dimensions of humanity and that manages to bring young graduates in the position of qualitative human resource, qualified for the new trends and requirements on the labour market. Thus, we will present different models of digitalized education, used by European countries but also by Romania in the context of the coronavirus pandemic.

3. Research Questions/Aims of the research

The main objective of this research is to show that the future of education can no longer be a model in which digitalization and technology are only an educational component but on the contrary, it must be designed so as to achieve a technology both horizontally and vertically and to totally transform the educational system at the level of the two triads of teaching-learning-assessment and students-teachers-parents.

The new era of digitization must be implemented even when teaching is face-to-face. It is also necessary to bring to the fore all the positive aspects or those that raise problems in terms of online education; identification of teachers' competencies regarding the use of computer-assisted technology in the teaching act, as well as the continuous improvement of these competencies; identification of those tools and methods that teachers use in online teaching as well as the efficiency and effectiveness and innovation produced by them; adapting students and teachers to remote education; analysis of classroom management and how students, but also teachers and students and even students and parents and teachers and parents can collaborate and why not highlighting the relevance, usefulness and effectiveness of support measures offered to both teachers and students for remote education.

The set in of the pandemic has made digital technology an essential component of the act of education and not only, along with the media and telecommunications. The European Commission and all political and administrative structures in European countries are making consistent efforts to ensure the necessary infrastructure, connectivity and regulations in order to keep people active and especially safe in the online environment. Digital networks present platforms that have the role of offering not only a multitude of information, but also creative and innovative learning models, skills sharing solutions and online collaboration and creativity (Schleicher, 2020). An important part of doing business online, especially when we talk about education and children, is that of cybersecurity and our trust and safety as individuals when we are online.

In Romania, starting with March 11th, when the governmental structures announced the closure of schools, the education system has undergone a radical transformation by moving for the first time, at least within the state pre-university education system, to online remote learning, by adopting platforms and ways of using digital technologies. Unfortunately, there were several problems related to the lack of technology, internet connection, teacher training, issues felt especially in rural areas, so that this pandemic caused for some of the students the total rupture of school and education, and for the area The teachers' dissatisfaction in the urban area was related to the lack of a high-performance technology, in most cases outdated technologies that could not support access to new applications and platforms being used. Another major problem was the communication on streaming platforms through which direct, real-time communication between teachers and students is achieved and which was perceived as an artificial communication, either due to the development in virtual space or due to the lack of authentic feedback in communication, as well as blockages or barriers of nonverbal communication or the use of paralanguage. And last but not least, the interruption or blocking of communication due to the loss of internet connection, limited bandwidth capacity or very high data traffic (Botnariuc, Cucos, Glava, Iancu, Ilie, Istrate, Labăr, Pâinișoară, Ștefănescu, Velea, 2020).

Thus, in the conditions in which a continuation of the remote measures and of the pandemic is foreseen, it is necessary to find some innovative models of education, and those that have already been applied and have been successful should be implemented in as many education systems, not only at the level of developed countries in the EU, but also at the level of countries with lower funding, where they should recover from the gaps in the conditions stated above.

4. Research Methods

Following the analysis, the reports prepared by the European Commission, UNICEF, OECD, MEC, ISMB, ISE and other databases we were able to get a general opinion on how the educational activities took place both at EU level and in Romania, in the new conditions imposed by the COVID-19 pandemic. Based on the data presented, but also on the basis of written reports or following the sharing of experiences by teachers and students throughout this period, we could see that there is a wide variety of digitized resources; some already existed, others were created right now and that is an important niche in the area of business on edu-techology, a field very little touched by the great giants in the field of technology and artificial intelligence.

Following the analysis of data provided by Eurostat, it was possible to analyse how not only individuals but also households are connected to the virtual environment and technology, as well as the areas of interest they have in terms of interaction in the area education with technology and online education. All the analysed data are only for 2019, and for Romania there are more recent data, collected by a group of researchers in the field of education sciences, based on a questionnaire applied to a sample of 6000 teachers from rural areas, but also from

small and big urban areas covering all levels of education − preschool, primary, secondary, high school and post-high school.

These data are relevant not only to the negative aspects of online education imposed by the pandemic, but also to the aspects that have worked and represent a starting point to truly succeed in an innovation of the education system.

5. Findings

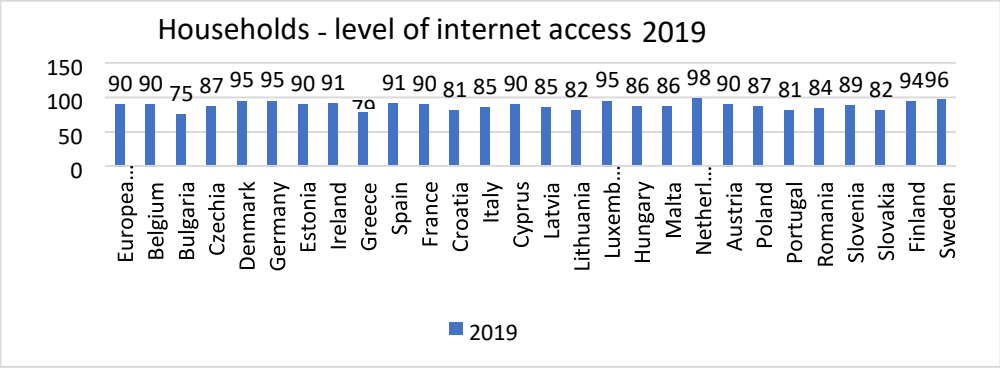

Figure 2. Households level of internet access
Source: Eurostat (2020)

If we take into account the data processed in the graph above regarding the household level of internet access, we find that at EU level there is a coverage of 90%, also the values range from 75%, the minimum value, as recorded in Bulgaria and up to 98%, the maximum value in the Netherlands. For Romania there is a value of 84%, which places us in a middle zone.

Also, if we analyse the percentage of all those who have basic overall digital skills, as well as only those aged 16-19 who have basic overall digital skills, we can see that at EU level young people are in a share of 82%, compared to the calculation made for all individuals where the percentage is only 56%. The skills of young people are much higher and range from 57% in Bulgaria and Romania where they are the lowest values and reach 100% in Croatia and values of over 95% in countries such as Iceland, Norway, Malta or Estonia. Unfortunately, young people in Romania are at the bottom of the rankings for these skills. And if we analyse the graph in which the abilities of all individuals are presented, we notice that the position of states in this graph is the same as that of the 16-19 year old group, with the difference that the percentages are lower, due to older people who have reduced basic overall digital skills.

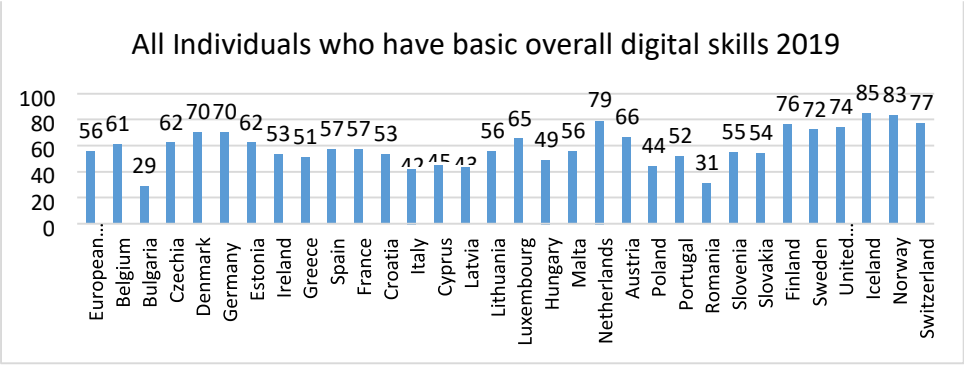

Figure 3. All individuals who have basic overall digital skills
Source: Eurostat (2020)

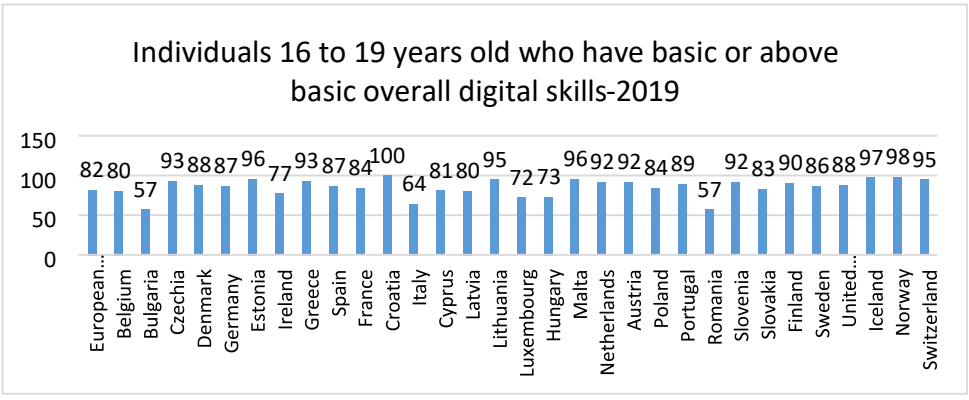

Figure 4. Individuals 16-19 old who have basic or above basic overall digital skills
Source: Eurostat (2020)

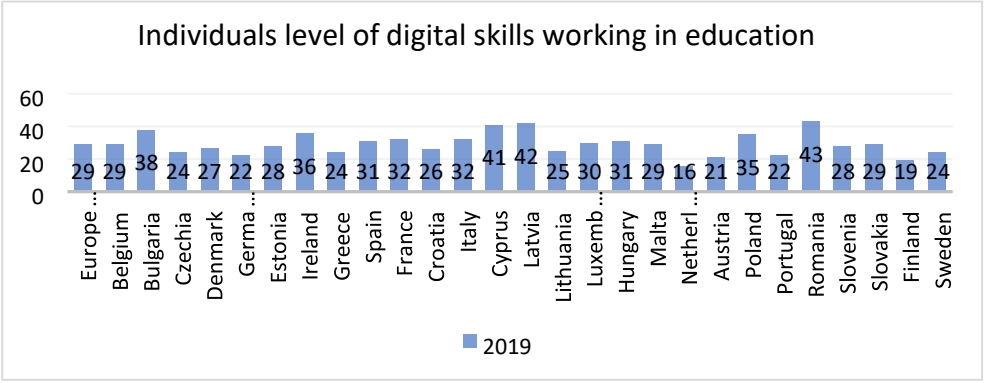

Figure 5. Individuals level of digital skills working in education
Source: Eurostat (2020)

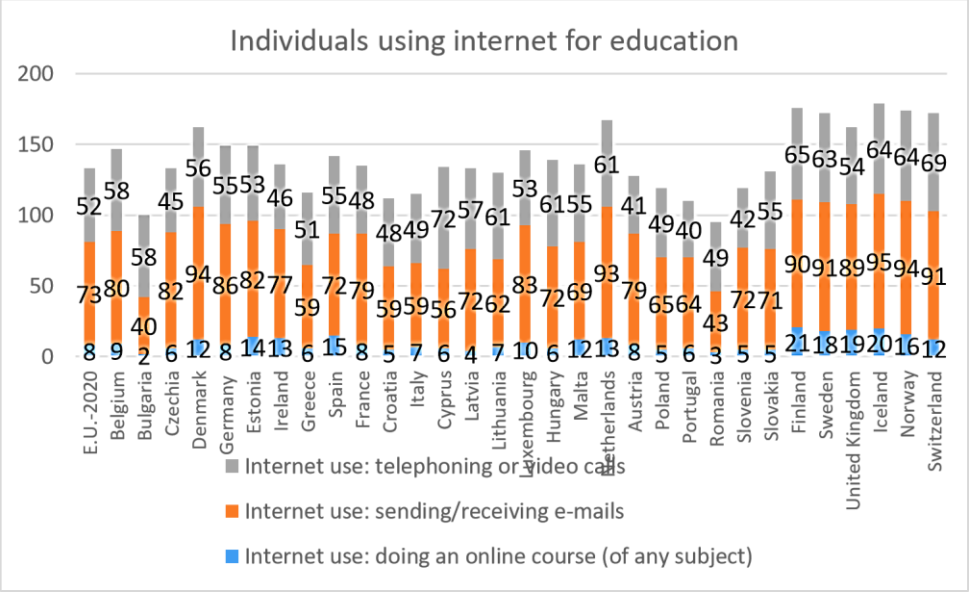

Figure 6. Individuals using internet for education
Source: Eurostat (2020)

If we analyse how things are related in terms of education, either in terms of human resources and the level of digital competence, we can see that in the EU, the percentage is 29%, with the lowest values recorded in the Netherlands 16% and Finland 19 %, and the highest values in Romania with 43%. Regarding the way the internet is used for education, three aspects were considered: telephone or video call, sending/receiving emails and doing an online course. The graph above shows that the largest share is represented by sending/receiving emails and the lowest share is represented by the online course. In the category of online courses, the best are Finland and Iceland with 21% and 20%, respectively, and the worst are Bulgaria and Romania with 2% and 3%, respectively.

6. Conclusions

The pandemic crisis that has set in worldwide has caused the whole society to suddenly change the natural order of things and force people to value one of their greatest abilities, namely the ability to adapt and implicitly the power of innovation, finding new solutions for new situations. The education system was one of those that was reinvented, but the effects will be felt only in the coming years. The transition to remote education forced the imposition of technological pedagogy models as well as the mandatory existence of an internet source and a device, which was not possible in all geographical areas, so there were total disruptions in education in areas with poor populations, for children from disadvantaged backgrounds, often on the verge of poverty and who, in addition to not having access

to education, were also deprived of social programs such as "Milk and Bun" or "School after school", which deepened and more the limits of poverty. On the other hand, the transition to digitalization is a major requirement of today's society that needs young people ready to face the new demands of life and to be prepared for the professions of the future, all of which are very closely related to technology and artificial intelligence. For many of the education systems, especially those in urban areas, the transition to distance learning has been easy, and pedagogical models have been increasingly creative and more applicable to the new demands of the labour market.

Thus, a movement of social imbalances and an attempt to bring technological systems to poor environments, not only for students but also for teachers is required, which must be done as soon as possible given that the pandemic crisis is just beginning, and the online education system will probably be the most affordable solution for the future.

References

[1] Aithal, P. S., & Shubhrajyotsna Aithal, P. (2015). An Innovative Education Model to realize Ideal. *International Journal of scientific research and management (IJSRM),* 3(3), pp. 2462-2469. Retrieved from www.ijsrm.in.

[2] Botnariuc, P., Cucos, C., Glava, C., Iancu, D. E., Ilie, M. D., Istrate, O., Labăr, A. V., Pâinișoară, I.-O., Ștefănescu, D., Velea, S. (2020). *Școala online − Elemente pentru inovarea educației - Raport de cercetare evaluativă.* București: Editura Universității din București.

[3] Davis, F. D. (1989). Theory of acceptance of technology states that the criterion for choosing a technological solution is its ease of use, as perceived by those who intend to use it, rather than its usefulness. *MIS Quaterly*, 13. Retrieved 07.12.2020.

[4] Dumulescu, D., Balazsi, R., & Oprea, A. (2015). Calling and career competencies among Romanian students: The mediating role of career adaptability. *Procedia- Social and Behavioral Sciences*, 209, pp. 25-32.

[5] European Comission. (2018). *https://eur-lex.europa.eu/legal-content/EN/TXT/?uri= COM:2018:22:FIN*. Retrieved from https://eur-lex.europa.eu/.

[6] MEC. (2019). *Raport privind starea invatamantului.* MEC, București. Retrieved 07 12, 2020, from https://www.edu.ro/sites/default/files/Raport%20privind%20starea%20%C3%AEn v%C4%83%C8%9B%C4%83m%C3%A2ntului%20preuniversitar%20din%20 Rom% C3%A2nia_2017-2018_0.pdf.

[7] Schleicher, A. (2020, march 23). *How can teachers and school systems respond to the COVID-19 pandemic? Some lessons from TALIS.* Retrieved 07.12.2020, from https://www.oecd-forum.org/: https://www.oecd-forum.org/users/50583-andreasschleicher/posts/63740-how-canteachers-and-school-systems-respond-to-the-covid-19-pandemic-some.

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Developing Economics Students' Research Skills – A Step Towards Increasing Employability Chances

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Abstract

The present paper aims to show how higher education institutions can contribute to the increased employability of their students by engaging the latter in research activities. We first examine the skills which 21st century employers are looking for in job candidates (as highlighted by leading Romanian and international publications). Next, we show the way in which student research skills are linked to the labour market demands for professional competences. The most extensive part of the paper is dedicated to the examination of the research activities undertaken by Bachelor's and Master's students at the Bucharest University of Economic Studies (ASE), Romania. More specifically, we undertake a descriptive quantitative analysis of the programmes of the Annual Students' Conferences organised by ASE during 2016-2019, focusing on issues such as the number of student papers, the weight of student papers in foreign languages, the choice for single or collaborative authorship, and the financial incentives provided for student research. We show that, at University level, 4.5% of students submitted papers for Annual Students' Conferences editions, with 1st year Bachelor's students and 2nd year Master's students submitting the highest number of papers; student papers were written in a variety of languages (Romanian, English, French, German, as well as Romanian for foreigners, Italian, Russian, Japanese and Spanish); there was a clear preference for single authorship at University level; and the University tries to stimulate student research through a variety of (financial) incentives.

Keywords: student research; higher education; employee skills; labour market demands; Bucharest University of Economic Studies (ASE), Romania.

JEL Classification: A11, A22, A23, I23, I25, J23, J24, J33, O15

1. Introduction

Higher education institutions are widely expected to equip students with the right mix of knowledge and skills that would allow them to find a job quickly and act as outstanding professionals that contribute to their employers' (and country's) development. This expectation is even higher when it comes to economics and business universities. Hence, our interest in analysing the way in which on-campus activities may contribute to meeting this expectation. More specifically, we would like to see how student research activities contribute to increasing graduates'

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employability chances[4]. Firstly, we review key publications in Romania and abroad on the professional skills demanded by the 21st century labour market; secondly, we discuss how research activities may contribute to the development of such skills; thirdly, we discuss in detail students' research activities conducted at the Bucharest University of Economic Studies (henceforth ASE), Romania, in the period 2016-2019. Mention should be made that, for reasons of space, this article refers exclusively to research conducted by ASE's students on the occasion of the Annual Students' Conferences.

These scientific events are by no means the only occasions for students to conduct research. In fact, ASE provides various opportunities for student research: starting from the requirements for the successful completion of academic subjects (e.g., written project submission and presentation[5]) and of study cycles (Bachelor's, and Master's graduation papers, Doctoral theses); to the participation in various scientific events (conferences, seminars, workshops) organised for young researchers, which benefit from the participation of keynote speakers from leading world universities and research hubs; to the participation in student conferences such as the Annual Students' Conferences, or the National Olympiad of Students in Economics organised by the Association of Faculties of Economics in Romania (AFER) which ASE is a member of; to the inclusion in student-teacher mixed interdisciplinary research teams working on topics undertaken by ASE' 23 research centres; or to the employment on researcher positions for internationally-funded research projects (according to Istudor 2016, p. 34, Istudor 2017, p. 38, Istudor 2018, p. 48-49, Istudor 2019, p. 53-54)[6].

2. Problem Statement

This section briefly refers to a few publications that tackle the topic of skills and competences required on the 21st century labour market, both in Romania and globally. We do so in order to shed light on national and international trends and to see how developing students' research skills could help them increase employability chances.

At *national* level, one of the top 10 online recruitment sites in Romania[7] lists the skills that employers in this country mostly value in young graduates looking for a job: adaptability or "copying with the new", proactive behaviour, complex problem-solving, lifelong learning, emotional intelligence, teamwork and analytical thinking (Hipo.ro, 2020, p. 13ff). Several studies have also addressed the issue under consideration, and here is what they pointed at: Stanciu & Banciu (2012)

[4] For an analysis on how universities can contribute to the development of the multilingual and multicultural skills demanded by the 21st century labour market, Dima et al. (2018), Pătru et al. (2018), Dima et al. (2019), Mohanu et al. (2019).

[5] According to, for instance Dima & Panait (2019), for data on the weight of written and oral projects in the evaluation tools used by academics who teach at a Bachelor's programme organised by the Faculty of International Business and Economics within ASE.

[6] Interestingly, ASE has also been actively involved in stimulating research at pre-university level, by organising and hosting high school pupils' conferences on economic topics, such as the Accounting Contest for Pupils from Economic High-Schools (organised since May 2017 by the Faculty of Accounting and Management Information Systems within ASE), and the Interdisciplinary Olympiad "ASE for High-School Pupils" (organised since 2019 by ASE in partnership with renowned Economic and National Colleges in Bucharest) (according to Istudor 2019, p. 142).

[7] For Hipo.ro's inclusion among the top 10 recruitment sites in Romania, according to Ziarul financiar (2010), The Wallet (2018).

showed that, when hiring graduates (in general), Romanian employers look for organizational skills, team work, communication skills, punctuality. Deaconu et al. (2014) identified a set of 20 skills that graduates in general and business graduates should possess to meet Romanian employers' expectations, for instance: "promptness and efficient time management; results orientation; communication and interaction skills; effective teamwork skills; computer literacy; the ability to analyse and question things" (p. 867). Foerster-Pastor & Golowko (2017, 2018) grouped the skills Romanian business graduates are expected to possess into three categories: hard skills (such as IT, data analysis etc.), soft skills (e.g., analysis and problem solving, communication, team work, prioritization), and personal attributes (results oriented etc.).

At *international* level, research has pointed to similar graduate skills across continents. Thus, Jackson & Chapman (2009) examined the "profile of competences which [Australian] employers most want in the modern business graduate[s]", based on a set of "20 competence clusters" referring to issues such as "understand, evaluate and apply the business management methods, policy, theory, research and laws; analyse and use numbers and data accurately AND select / use appropriate technology; recognise patterns in documents to see the bigger picture AND evaluate and retain key points in documents / scenarios" etc. (pp. 20-21). All 20 competency clusters are defined at length, with keywords such as "logical reasoning", "creative thinking", "collaboration", oral presentation, public speaking etc. Moreover, Wickam (2015) identified a set of 19 employability skills characterizing US business graduates, among which we find a series of skills enhanced by undertaking research: "ability to assimilate new technology, ability to work in teams, […], analytical ability, […] computer word-processing skills, creativity and creative thinking, […] oral communication, […] presentation skills, […] time management, written communication" (pp. 165-166). McMurray et al. (2016) researched on the demands of UK employers from graduates in general (who are supposed to evince "communication skills, team working skills, integrity, intellectual ability, and confidence" (p. 6)), and business school graduates (who are required a list of 14 characteristics, among which "communication skills, team working, numeracy, language skills, technology skills, writing, reading" (p. 16)). Moreover, Tables 1 and 2 below capture the skills identified as essential by the Organization for Economic Cooperation and Development, and by the World Economic Forum, respectively:

Table 1. Indicators of skills use at work

	Indicator	Group of tasks
Information-processing skills	Reading	Reading documents (directions, instructions, letters, memos, e-mails, articles, books, manuals, diagrams, maps)
	Writing	Writing documents (letters, memos, e-mails, reports, forms)
	Numeracy	Calculating prices, costs or budgets; use of fractions, decimals or percentages; use of calculators; preparing graphs or tables; algebra or formulas; use of advanced math or statistics (calculus, trigonometry, regressions)
	ICT skills	Using e-mail, Internet, spreadsheets, word processors, programming languages; conducting transactions on line; participating in online discussions (conferences, chats)
	Problem solving	Facing hard problems (at least 30 minutes of thinking to find a solution)
Other generic skills	Task discretion	Choosing or changing sequence of job tasks, the speed of work; choosing how to do the job
	Learning at work	Learning new things from supervisors or co-workers; learning-by-doing; keeping up-to-date with new products or services
	Influencing skills	Instructing, teaching or training people; making speeches or presentations; advising people; planning others' activities; persuading or influencing others; negotiating.
	Co-operative skills	Co-operating or collaborating with co-workers
	Self-organising skills	Organising one's time and activities
	Dexterity	Using skill or accuracy with one's hands or fingers
	Physical skills (gross)	Working physically for a long period

Source: OECD, Quintini, 2014, p. 21

Table 2. Comparing skills demand, 2018 versus 2022, top ten

Today, 2018	Trending, 2022	Declining, 2022
Analytical thinking and innovation	Analytical thinking and innovation	Manual dexterity, endurance and precision
Complex problem-solving	Active learning and learning strategies	Memory, verbal, auditory and spatial abilities
Critical thinking and analysis	Creativity, originality and initiative	Management of financial, material resources
Active learning and learning strategies	Technology design and programming	Technology installation and maintenance
Creativity, originality and initiative	Critical thinking and analysis	Reading, writing, math and active listening
Attention to detail, trustworthiness	Complex problem-solving	Management of personnel
Emotional intelligence	Leadership and social influence	Quality control and safety awareness
Reasoning, problem-solving and ideation	Emotional intelligence	Coordination and time management
Leadership and social influence	Reasoning, problem-solving and ideation	Visual, auditory and speech abilities
Coordination and time management	Systems analysis and evaluation	Technology use, monitoring and control

Source: Future of Jobs Survey 2018, World Economic Forum, p. 12

By comparing the data briefly referred to above, we notice that employers in Romania and abroad are looking for similar skills, which is to be expected in this increasingly globalized world. We would like to argue that several of these skills can be developed by higher education institutions by encouraging student research activities.

> Before we further explain our proposal, we would like to clarify what we mean by 'research'. The OECD, Frascati Manual (2015: p. 29) refers to three types of research activities: basic research, applied research and experimental development. **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. **Applied research** is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. **Experimental development** is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

When conducting basic, applied or experimental research activities, one makes use of several skills from the ones mentioned by Hipo.ro (2020), OECD (2014) and World Economic Forum (2018), as well as by the aforementioned scientific publications. Thus, in Table 3 below we group research steps[8] with associated skills:

[8] We have grouped the 7 or 10 research steps found in US Student Research Guides (according to University of Michigan, and University System of Georgia, respectively) into the first 4 steps in our Table 3, and we added step 5, since it is often the case that research findings are disseminated by means of oral presentations during conferences and symposia etc.

Among the numerous publications on research steps and skills, we would like to refer only to Garvin (2009) and Cottrell (2013), who put forth a more or less detailed picture of the model provided in Table 3 below. Thus, Garvin (2009) proposes a 4-step approach to research: "identify the precise question you are trying to answer; map a research strategy; be aware of copyright or other restrictions on re-use; and have a plan for documenting your work research results." (p. 7).

Cottrell (2013) lists the following "strong core" research skills for students: "finding good quality information at speed, reading selectively and at speed, […] knowing how to use the information you find in appropriate ways […], select and interpret [information] with a critical eye […,] at least a basic understanding of, and confidence in, manipulating numbers […,] good basic skills in writing." (p. 151ff).

Table 3. Research steps and necessary skills

Research steps	Skills
1. Documentation	reading, problem solving, task discretion, self-organizing skills, attention to detail; coordination and time management; active learning
2. Evaluation of sources and materials	reading, problem solving, task discretion, self-organizing skills, analytical thinking, attention to detail; coordination and time management; active learning
3. Writing, proof reading, revising and rewriting the publication version	reading, writing, numeracy, ICT skills, problem solving, task discretion, self-organizing skills, analytical thinking; creativity, originality and initiative; attention to detail; coordination and time management; active learning
4. Citation and references	reading, writing, ICT skills, problem solving, task discretion, self-organizing skills, attention to detail
5. Presenting research findings to audiences (which requires: a. writing, proof reading, revising and rewriting the materials for the oral presentation; b. b. delivering the oral presentation)	reading, writing, numeracy, ICT skills, problem solving, task discretion, influencing skills, self-organizing skills, attention to detail; coordination and time management; active learning

As Table 3 above shows, each of the research steps is complex, favouring the use of several highly demanded skills. Moreover, if one considers the fact that research is often undertaken collaboratively, we may safely associate 'influencing skills', 'cooperative skills', 'emotional intelligence' with any given step of the research activity.

Having pointed to the way in which research activities are associated with the skills 21st century employers are looking for in potential employees, we would now like to present the way in which the topmost Romanian economic university fosters the development of such (research) skills in its students.

3. Research Questions / Aims of the Research

The current article aims to shed light on research activities undertaken by economics students enrolled at the Bucharest University of Economic Studies, Romania, on the occasions provided by the Annual Students' Conferences held in 2016-2019. We examined the programmes of the said student conferences, taking into consideration the panels organised by all the academic departments of ASE's 11 Faculties[9] that offer Bachelor's and Master's study programmes, hence organizing student conference panels for both types of study cycles. Our research aimed at shedding light on the following aspects: the number of student papers per faculty, cycle of study and year of study, the student papers in foreign languages, the preferred type of authorship – single or collaborative, and the financial incentives that ASE provides for student research.

We examine student research endeavours, as it is our firm belief that such endeavours help prepare them for the labour market in general (for the reasons mentioned in section 2 above) and for working in the business field in particular, as "[t]he business enterprise sector employs more than half of the research population in the OECD area" (OECD, 2011, p. 11).

[9] The Bucharest University of Economic Studies (ASE) also has a 12th Faculty entitled Bucharest Business School, which only organizes MBAs. It did not organize panels for the Annual Students' Conferences in 2016-2019, hence this paper makes no reference to its students' research interests.

4. Research Methods

The article is a *descriptive* (observational) quantitative analysis, in the sense of Mertler (2016: p. 111), as the authors are "simply studying the phenomenon of interest *as it exists naturally*, no attempt is made to manipulate the individuals, conditions, or events". The analysis examines student research only in terms of papers authored by students for the Annual Students' Conference editions of 2016-2019. The period of data collection was January to April 2020, and data sources were the Annual Students' Conference Programmes (2016-2019), ASE's Board of Trustees' Newsletters (2016-2019), the Annual Report of the Rector of the Bucharest University of Economic Studies on the State of the University (Istudor, 2016-2019).

5. Findings

The current section provides details on the economics students' research interests as can be observed in their contribution to the Annual Students' Conferences organised by the Bucharest University of Economic Studies (ASE), during 2016-2019. As briefly stated in section 4 above, we embark upon a *descriptive* quantitative analysis of the student conference programmes of the Bachelor's and Master's panels organised by all the academic departments of ASE's Faculties that offer Bachelor's and Master's study programmes.

We start by referring to the number of student papers per cycle of studies, as shown in Figure 1 below. Out of a total number of 3871 student papers, 3178 (82%) were submitted by Bachelor's students, whereas 693 (18%) were submitted by Master's Students:

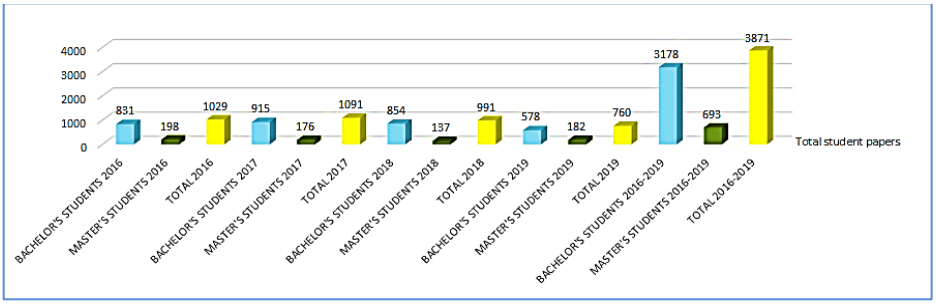


Figure 1. Student papers per cycle of studies, 2016-2019

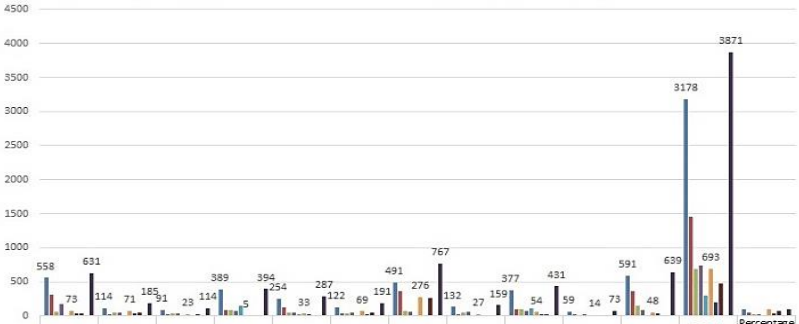
The numbers in Figure 1 above can be explained if we consider the number of Bachelor's and Master's students enrolled in the University's respective study cycles. Thus, by consulting ASE's Board of Trustees' Newsletters (2016-2019), as well as the Annual Report of the Rector of the Bucharest University of Economic Studies on the State of the University (Istudor, 2016-2019), we compiled the data in Table 4 below[10], which shows that Bachelor's students (and papers) are consistently more numerous each year. Moreover, Table 4 shows that 4.5% of the University's students present research results on the occasion of the Annual Students' Conference.

[10] Since MBA and Doctoral students did not present papers in the Annual Students' Conferences 2016-2019, we did not include such students in Table 4.

Table 4. Student enrolled in Bachelor's and Master's studies 2016-2019 and Total student papers at University level 2016-2019

	Number of students enrolled in 2016-2019	Total student papers at University level
Bachelor's students 2016	15470	831 (5.4%)
Master's students 2016	5756	198 (3.4%)
TOTAL Students 2016	**21226**	**1029 (4.8%)**
Bachelor's students 2017	15856	915 (5.8%)
Master's students 2017	5761	176 (3.1%)
TOTAL Students 2017	**21617**	**1091 (5%)**
Bachelor's students 2018	15569	854 (5.5%)
Master's students 2018	5913	137 (2.3%)
TOTAL Students 2018	**21482**	**991 (4.6%)**
Bachelor's students 2019	16098	578 (3.6%)
Master's students 2019	5811	182 (3.1%)
TOTAL Students 2019	**21909**	**760 (3.5%)**
Bachelor's students 2016-2019	62993	3178 (5%)
Master's students 2016-2019	23241	693 (3%)
TOTAL Students 2016-2019	**86234**	**3871 (4.5%)**

Figure 2 below depicts the distribution of student papers by years of study. We notice that 1st year Bachelor's (BA) students and 2nd year Master's (MA) students submitted consistently the highest number of papers – 45.9% and 68.4% of the respective cycle of studies. The data table contains two rows entitled 'unspecified year BA' and 'unspecified year MA' to show that the conference programmes also included a series of student papers whose authors were not identified by year of study. It may be the case that such students were first year students in each cycle of study, but since we cannot definitely assert that, we have chosen to represent them separately. However, their numbers are extremely low – 9.3% of the total BA student papers and 1.6% of the total MA student papers.



	AMP	BT	FABIZ	CSIE	CIG	EAM	ETA	FABBV	MAN	MRK	REI	Total student papers	Percentage of total student papers
BACHELOR'S STUDENTS 2016-2019	558	114	91	389	254	122	491	132	377	59	591	3178	100,0
1st year BA	315	24	17	87	129	33	363	21	94	20	357	1460	45,9
2nd year BA	64	45	30	83	49	36	67	51	93	12	154	684	21,5
3rd year BA	179	46	38	75	51	53	61	60	74	22	80	739	23,3
unspecified year BA	0	0	6	144	25	0	0	0	106	15	0	296	9,3
MASTER'S STUDENTS 2016-2019	73	71	23	5	33	69	276	27	54	14	48	693	100,0
1st year MA	36	29	0	0	22	27	13	15	26	3	33	204	29,4
2nd year MA	37	42	23	0	11	42	263	12	28	11	5	474	68,4
unspecified year MA	0	1	0	0	0	0	0	0	0	0	10	11	1,6
TOTAL STUDENT PAPERS 2016-2019	631	185	114	394	287	191	767	159	431	73	639	3871	100,0

Figure 2. Student papers per year of study, 2016-2019

We now take a closer look at the number of student papers at Faculty level. Figure 3 below shows that most papers were submitted for panels organised by the Faculty of Theoretical and Applied Economics ETA – 20%, the Faculty of International Business and Economics REI – 17% and the Faculty of Administration and Public Management AMP – 16%, whereas the smallest number of papers were submitted for panels organised by the Faculty of Finance and

Banking FABBV – 4%, the Faculty of Business Administration in Foreign Languages FABIZ – 3% and the Faculty of Marketing MRK – 2%.[11]

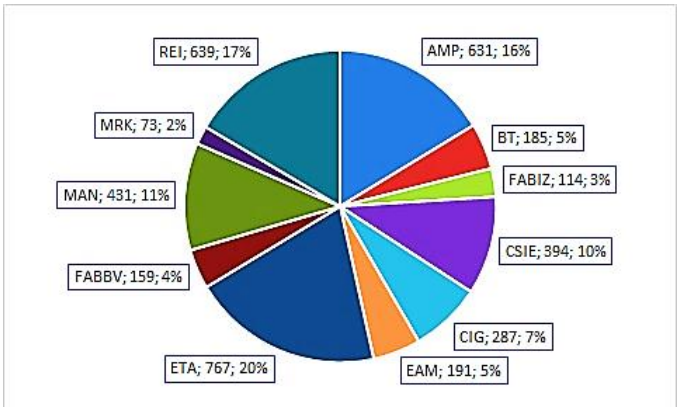


Figure 3. Student papers per Faculty from the total number of papers, 2016-2019

With regard to Figure 3 above, mention should be made that the student papers were grouped depending on the Faculty organizing the panels students chose to attend, and not by the Faculty students originated from. Moreover, students enrolled in one Faculty opted for submitting papers for panels organised by their own Faculty and/or other Faculties. Hence, it is expected (and it is indeed the case) that the number of research papers submitted by the students from each Faculty does not correlate with the number of students enrolled in each Faculty. Thus, the Faculties with the highest number of enrolled students were the Faculty of Economic Cybernetics, Statistics and Informatics CSIE, the Faculty of Management MAN and the Faculty of International Business and Economics REI, whereas the Faculties with the lowest number of enrolled students were the Faculty of Administration and Public Management AMP, the Faculty of Agrifood and Environmental Economics EAM and the Faculty of Theoretical and Applied Economics ETA (according to Istudor, 2016-2019).

Figure 4 below provides details on the students' choice to submit research papers for the panels organised by their own Faculty (identified as 'BA/ MA own students') or by another Faculty (identified by two labels). The latter students are grouped into 'BA/ MA incoming students' – which reflects the number of students who 'come' from a different Faculty to submit papers for the panels organised by a given Faculty, and 'BA/ MA outgoing students' – which reflects the number of students who 'go' from their own faculty to submit papers for a different faculty:

[11] The abbreviations in Figure 2 stand for the following Faculties: AMP - Faculty of Administration and Public Management, BT - Business and Tourism, FABIZ - Faculty of Business Administration in Foreign Languages, CSIE - Faculty of Economic Cybernetics, Statistics and Informatics, CIG - Faculty of Accounting and Management Information Systems, EAM - Faculty of Agrifood and Environmental Economics, ETA - Faculty of Theoretical and Applied Economics, FABBV - Faculty of Finance and Banking, MAN - Faculty of Management, MRK - Faculty of Marketing, REI - Faculty of International Business and Economics.

	AMP	BT	FABIZ	CSIE	CIG	EAM	ETA	FABBV	MAN	MRK	REI	Total student papers	Percentage of total student papers
1st year BA - own students	315	22	17	27	105	33	85	21	74	19	203	921	29,0
1st year BA - incoming students	0	2	0	60	24	0	278	0	20	1	154	539	17,0
1st year BA - outgoing students	29	14	181	18	39	8	4	63	34	34	47	471	14,8
2nd year BA - own students	64	45	30	42	41	36	67	43	78	12	102	560	17,6
2nd year BA - incoming students	0	0	0	41	8	0	0	8	15	0	52	124	3,9
2nd year BA - outgoing students	16	1	28	7	21	1	2	29	27	18	13	163	5,1
3rd year BA - own students	179	46	38	52	27	53	59	59	68	22	72	675	21,2
3rd year BA - incoming students	0	0	0	23	24	0	2	1	6	0	8	64	2,0
3rd year BA - outgoing students	0	0	8	23	2	2	1	7	2	0	14	59	1,9
1st year MA - own students	36	29	0	0	22	27	13	15	22	3	33	200	28,9
1st year MA - incoming students	0	0	0	0	0	0	0	0	4	0	0	4	0,6
1st year MA - outgoing students	0	0	0	0	0	0	0	0	0	4	0	4	0,6
2nd year MA - own students	37	42	23	0	11	42	263	12	28	10	5	473	68,3
2nd year MA - incoming students	0	0	0	0	0	0	0	0	0	1	0	1	0,1
2nd year MA - outgoing students	0	0	0	0	0	0	0	0	0	0	0	0	0,0
TOTAL STUDENT PAPERS 2016-2019	631	185	114	394	287	191	767	159	431	73	639	3871	100,0
total BA - own students	558	113	85	121	173	122	211	123	220	53	377	2156	67,8
total BA - incoming students	0	2	0	124	56	0	280	9	41	1	214	727	22,9
total BA - outgoing students	45	15	217	48	62	11	7	99	63	52	74	693	21,8
total MA - own students	73	71	23	0	33	69	276	27	50	13	38	673	97,1
total MA - incoming students	0	0	0	0	0	0	0	0	4	1	0	5	0,7
total MA - outgoing students	0	0	0	0	0	0	0	0	0	4	0	4	0,6

Figure 4. Student papers per Faculty of origin, 2016-2019

By analysing Figure 4 above, we notice the following:

- papers authored by 'BA/MA own students' are consistently the most numerous, at several levels – at University level, per cycle of studies, and per year of study;
- at Faculty level, papers authored by 'BA own students' are surpassed by 'BA incoming students' in the case of the Faculty of Economic Cybernetics, Statistics and Informatics CSIE, and the Faculty of Theoretical and Applied Economics ETA, and by 'BA outgoing students' in the case of the Faculty of Business Administration in Foreign Languages FABIZ;
- the faculties that attract the most 'BA incoming students' are the Faculty of Theoretical and Applied Economics ETA (280 papers), the Faculty of International Business and Economics REI (214 papers), and the Faculty of Economic Cybernetics, Statistics and Informatics CSIE (124 papers);
- the faculties with the most numerous 'BA outgoing students' are the Faculty of Business Administration in Foreign Languages FABIZ (217 papers), the Faculty of Finance and Banking FABBV (99 papers), and the Faculty of International Business and Economics REI (74 papers);
- at University level, papers authored by 'BA own students' amount to 67.8% of the total amount of BA papers, whereas papers authored by 'MA own students' amount to 97.1% of all MA papers;
- papers authored by 'BA/ MA incoming students' are slightly more numerous at University level than 'BA/ MA outgoing students' – 22.9% BA and 0.7% MA incoming student papers versus 21.8% BA and 0.6 MA outgoing student papers;
- papers authored by 'MA incoming students' and by 'MA outgoing students' are almost non-existent at University level.

As to the reason for which BA students seem to be more flexible in choosing the panels of their own faculty or those of a different faculty, we may tentatively say that this situation reflects the fact that the Bachelor's curricula of each Faculty comprises core subjects taught by academic staff from all of the other Faculties. Similarly, it may also be the case that MA students prefer undergoing research for

the panels organised by their own Faculty due to the fact that the Master's curricula usually comprise subjects taught by academic staff from their own Faculty.

Next, Figure 5 below presents the number of student research papers in foreign languages submitted for the panels organised at Faculty level in the period under consideration. We notice that the highest number of papers in foreign languages were submitted for panels organised by the Faculty of International Business and Economics REI – 62%, the Faculty of Business Administration in Foreign Languages FABIZ – 15% and the Faculty of Theoretical and Applied Economics ETA – 13%, whereas the smallest number of papers in foreign languages were submitted for panels organised by the Faculty of Business and Tourism BT, the Faculty of Administration and Public Management AMP, the Faculty of Agrifood and Environmental Economics EAM, and the Faculty of Management MAN (0% each).

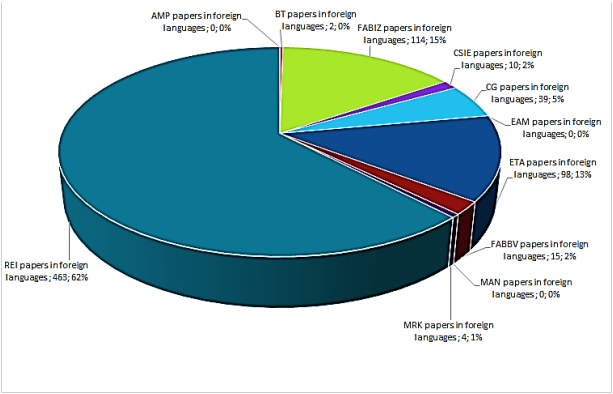


Figure 5. Student papers in foreign languages per Faculty from the total number of papers, 2016-2019

Since eight Faculties (BT, CIG, CSIE, FABBV, FABIZ, MAN, MRK, REI) of the 11 Faculties under consideration offer Bachelor's and Master's programmes in foreign languages, it is expected that they also organize panels with student research papers written in foreign languages. However, we noticed that BT and MAN did not organize panels in foreign languages in 2016-2019. This is not to say that the students enrolled in these Faculties did not submit papers written in foreign languages for panels organised by the other Faculties (in fact, Dima & Mohanu, 2020, show that students from BT and MAN each submitted 2% of the papers written in foreign languages for the panels organised by REI's Department of Modern Languages and Business Communication).

Conversely, since 3 Faculties (AMP, EAM and ETA) of the 11 Faculties under consideration do not offer Bachelor's and Master's programmes in foreign languages, it is expected that they do not organize panels with student research papers written in foreign languages. Nonetheless, we noticed that ETA did organize panels in foreign languages on an annual basis in the period 2016-2019. In fact, the foreign language panels organised by ETA benefited from the participation of students who were all enrolled at FABIZ and presented papers in English. (Moreover, Dima & Mohanu, 2020, also show that students from AMP and ETA each submitted 2% of the papers written in foreign languages for the panels organised by REI's Department of Modern Languages and Business Communication.)

As regards the languages which students wrote and defended their research papers in, Figure 6 below shows that the majority of papers were submitted in Romanian (81%) – which is to be expected since the majority of students are Romanian natives enrolled in study programmes with Romanian as language of instruction, and the majority of panels were organised in Romanian at Faculty level. Papers in foreign languages were written in English (10%), French (4%), German (1%) and other languages (4%). Students from only two Faculties – FABIZ and REI – submitted papers in all the three languages (English, French and German), which is to be expected, since the curricula of only these two Faculties contain obligatory foreign language classes in English, French and/or German (according to Dima et al. 2018).

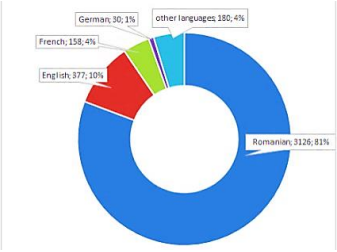


Figure 6. Student papers per language, 2016-2019

In what concerns the 'other languages' that students submitted papers in, Dima & Mohanu (2020) show that these papers were all submitted for panels organised by the Faculty of International Business and Economics REI, more specifically by the latter's Department of Modern Languages and Business Communication. The foreign languages used by students to write papers were: "Romanian for foreigners – 57 papers, Italian – 45 papers, Russian – 40 papers, Japanese – 31 papers, […] and Spanish – 14 papers"[12,13].

We now turn to another criterion used for analysing economics students' research interests, namely, the preferred type of authorship – single or collaborative. Table 5 below shows a clear preference for single authorship (64.7%) at University level[14]. Moreover, students' preference for working alone is

[12] These papers amount to 187, not 180 as in Figure 4 above. The discrepancy stems from the fact that the analyses are based on slightly different versions of the Annual Students' Conferences programmes – Dima & Mohanu (2020) analysed the programmes posted on the REI Faculty's website on the days of the Conferences, whereas the current analysis is based on the programmes announced by the Faculties a few weeks before the Conferences, and used by the managerial team of the Bucharest University of Economic Studies for decision making regarding financing and logistics.

[13] There were two categories of papers written and presented in Romanian – those authored by Romanian natives and captured in Figure 4 as 81% of the total number of papers, and those authored by foreign natives and counted in Figure 4 among the 'other languages'. The latter set of papers in Romanian are indeed different from the former in that Romanian is a foreign language for the authors of the latter set.

These papers are not the only papers written by foreign students enrolled at the University; however, this study does not address the issue of foreign students' research in the Bucharest University of Economic Studies.

[14] In what concerns papers written in foreign languages, Dima & Mohanu (2020) found "a rather balanced distribution of authorship options: 259 student papers in modern languages (56.4%) were written by single authors, with the remaining 200 papers (43.6%) being written by teams of authors".

even more obvious at Master's level, where 81.7% of the papers (566 out of 693) had single authors.

Table 5. Student papers by number of authors, 2016-2019

	Single author	More than 2 authors
Bachelor's students 2016	436	395
Master's students 2016	135	63
TOTAL 2016	**571**	**458**
Bachelor's students 2017	566	349
Master's students 2017	149	27
TOTAL 2017	**715**	**376**
Bachelor's students 2018	556	298
Master's students 2018	126	11
TOTAL 2018	**682**	**309**
Bachelor's students 2019	379	199
Master's students 2019	156	26
TOTAL 2019	**535**	**225**
Bachelor's students 2016-2019	1937	1241
Master's students 2016-2019	566	127
TOTAL 2016-2019	**2503 (64.7%)**	**1368 (35.3%)**

Source: Authors' own contribution

The last aspect that our analysis considers is the financial incentives offered by the University so as to encourage student research. Figure 7 below shows the net worth of cash prizes – in RON (the currency of Romania, used in payments per paper, not per author) and in EUR (rendered at the exchange rates from the dates at which the University's management teams communicated the decisions regarding the number of panels and prizes, as well as prize worth[15]).

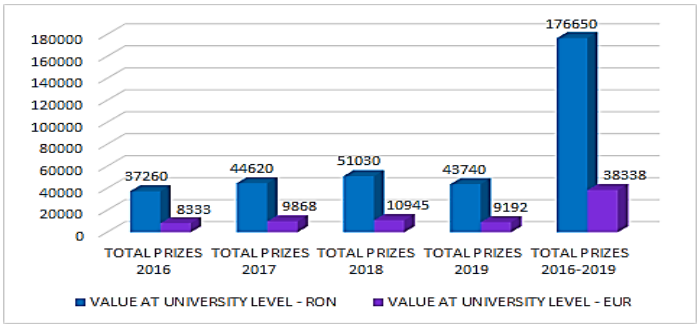


Figure 7. Cash prize worth of award winning student papers, 2016-2019
Source: Authors' own contribution

Apart from the cash prizes amounting to an average of nearly 9600 euro per year, the University also supported the organization of the Annual Students' Conferences by bearing the cost of the venue and by offering technical support for each of the students' conference panels, as well as refreshments for present and attending students and academics who served as members of the scientific boards of the conference panels. Naturally, the University also provided free of charge

[15] The decisions were communicated on April 14, 2016, April 12, 2017, March 14, 2018 and April 3, 2019 (we used internal University documents as sources, namely documents issued by the Division for Research and Innovation Management, and approved on by the Bureau of the Board of Trustees). Hence, we retrieved the exchange rates on the respective days from the Archive of the National Bank of Romania (BNR 2016-2019). On average, the exchange rate was 4.60 RON to the EUR.

access to a wide range of documentation sources, via the University Library, prior to the conferences.

In addition to the financial support provided at University level, students were encouraged to conduct and present research findings by the management teams of each Faculty. More specifically, various companies the representatives of which acted as members in the Faculties' Advisory Boards also awarded student authors with cash prizes, internships, company products or vouchers.

In conclusion, this section has presented the findings of the quantitative analysis of the research interests of economics Bachelor's and Master's students at the Bucharest University of Economic Studies (ASE), Romania, as resulting from the programmes of the Annual Students' Conferences organised by the University during 2016-2019. We have explored issues such as the number of student papers submitted to the panels organised by each of the 11 Faculties the educational offers of which comprise both Bachelor's and Master's study programmes; the weight of student papers in foreign languages; the choice for single or collaborative authorship; and the financial incentives provided for student research.

6. Conclusions

The current paper has addressed the way in which Romania's topmost economics and business oriented higher education institution – the Bucharest University of Economic Studies (ASE) – encourages student research activities. We have placed this investigation against the background of the need for universities to prepare their students for successful insertion on the labour market by equipping them with the skills demanded by the latter.

In Section 2, we reviewed key publications on the skills requested by 21st century employers. Moreover, we tried to highlight how these professional skills can be developed by participating in research activities. We also briefly mentioned the fact that ASE has been trying to foster student research activities, with results disseminated both during scientific events organised and held on its own premises, and during such events organised by higher education networks ASE is a member of.

We then presented the findings of our own quantitative examination of student research activities occasioned by the Annual Students' Conferences held in 2016-2019. We noticed that:

- at University level, 4.5% of students submitted papers for Annual Students' Conferences editions, with 5% of Bachelor's students, and 3% of Master's students choosing to submit papers for these events;
- at Faculty level, the highest number of papers were submitted for panels organised by the Faculty of Theoretical and Applied Economics ETA – 20%, the Faculty of International Business and Economics REI – 17% and the Faculty of Administration and Public Management AMP – 16%, whereas the smallest number of papers were submitted for panels organised by the Faculty of Finance and Banking FABBV – 4%, the Faculty of Business Administration in Foreign Languages FABIZ – 3% and the Faculty of Marketing MRK – 2%;
- at University level, per cycle and year of study, 1st year Bachelor's students and 2nd year Master's students submitted the highest number of papers;
- at Faculty level, the overwhelming majority of papers were submitted by each Faculty's own students;
- the Faculties that attracted the most papers submitted by students from other Faculties were the Faculty of Theoretical and Applied Economics ETA, the

Faculty of International Business and Economics REI, and the Faculty of Economic Cybernetics, Statistics and Informatics CSIE;

- the Faculties whose students submitted the most papers to other Faculties were the Faculty of Business Administration in Foreign Languages FABIZ; the Faculty of Finance and Banking FABBV, and the Faculty of International Business and Economics REI;
- as regards the languages student research papers, the majority of papers were submitted in Romanian (81%), followed by English (10%), French (4%), German (1%) and other languages (4%) – namely, Romanian for foreigners, Italian, Russian, Japanese and Spanish;
- as for students' choice for single or collaborative authorship, our analysis revealed a clear preference for single authorship (64.7%) at University level, a tendency which is even more obvious at Master's level (81.7%);
- considering the financial incentives provided for student research, we noticed a variety of such stimuli: cash prizes, internships, company products or vouchers.

The current study is but a small step in understanding how (economics) students' research skills can best be developed so as to enhance their employability chances. It would, of course, be interesting to pursue this investigation further by considering issues such as:

- adding a longitudinal qualitative perspective – by examining the theoretical versus applied topics chosen by students for research papers, as well as by investigating how students' research interests evolve from Bachelor's to Master's to Doctoral level, and how (or whether) such research interests reflect students' professional experience gained through direct contact with the work environment (i.e. internships, volunteer or paid work);).
- adding a mixed quantitative and qualitative perspective on enhancing economics students' motivation to undertake research throughout their university studies;
- examining the distribution by genders of students involved in research (one of the limitations of this article is that it does not address this issue, since it cannot be placed in the context of the distribution by genders of enrolled students, for lack of publicly available data at university level).

Acknowledgment

The authors would like to express their gratitude towards the staff of the Division for Research and Innovation Management of the Bucharest University of Economic Studies − ASE, Romania, for having provided access to internal University documents such as conference programmes, as well as managerial board's decisions on panels to be organised and prizes to be awarded.

References

[1] Buletin informativ al Consiliului de Administrație al Academiei de Studii Economice din București. (2016). [ASE's Board of Trustees' Newsletter. April 2016]. Retrieved from http://ca.ase.ro/Media/Default/Page/BI%20al%20CA%20APRILIE.%202016%20PDF.pdf.

[2] ASE's Board of Trustees' Newsletter. (April 2017). Retrieved from https://www.ase.ro/2013_files_en/despre_ase/pdf/Newsletter/BI_aprilie_2017_en.pdf.

[3] ASE's Board of Trustees' Newsletter. (March 2018). Retrieved from https://www.ase.ro/2013_files_en/despre_ase/pdf/Newsletter/BI_martie_2018_en.pdf.

[4] ASE's Board of Trustees' Newsletter. (April 2019). Retrieved from https://www.ase.ro/2013_files_en/despre_ase/pdf/Newsletter/BI_aprilie_2019_en.pdf.

[5] BNR. (2016-2019). Arhiva Curs BNR [Archive of the Exchange Rate. National Bank of Romania. 2016-2019], Retrieved from https://www.cursbnr.ro/arhiva-curs-bnr.

[6] Cottrell, Stella. (2013). *The Study Skills Handbook*. London & New York: Macmillan International Higher Education.

[7] Deaconu, A., Osoian, C., Zaharie, M., Achim, S. A. (2014). Competences in higher education system: an empirical analysis of employers' perceptions, *Amfiteatrul economic*, Vol. XVI, No. 37, pp. 857-873, https://www.amfiteatrueconomic.ro/temp/Journal_no_37.pdf.

[8] Dima, V. V., Mohanu, F. (2020, forthcoming). Preparing for the Labour Market - Developing Students' Multilingual and Research Skills, to appear in *Synergy*, 16 (2), pp. 117-130, http://www.synergy.ase.ro/issues/2020-vol16-no-2/1%20Dima_Mohanu.pdf.

[9] Dima, V. V., Mohanu, F., Hurduzeu, R.-E., Lorentz, M.-A, C. Pătru. (2018). Foreign Language Education in ASE Bucharest - A Quantitative Approach, in Dumitrescu, D.,, Zamfir, A. (coord.). 2018. *Proceedings of the 1st International Conference on Economics and Social Sciences*, Filodiritto Publisher, inFOROmatica srl, Via Castiglione, 81, 40124 Bologna (Italy), pp. 322-333, Retrieved from http://icess.ase.ro/index.php/icess-2018/icess-2018-proceedings.

[10] Dima, V. V., Mohanu, F., Șerban-Oprescu, A. T., Lorentz, M.-A, Nicolae, R. M. (2019, in print). Multiculturalism in Romanian Economic Higher Education. Part I – Western Cultural Centres, *Proceedings of the 2nd International Conference on Economics and Social Sciences*.

[11] Dima, V. V., Panait, N. A. (2019), Writing for One's Personal and Professional Development, in Militaru, M. L. (coordinating editor), *8th International Conference Synergies in Communication*, București: Editura ASE, pp. 58-68, Retrieved from https:// sic.ase.ro/wp-content/uploads/6.Viorela_Valentina.pdf.

[12] Foerster-Pastor, U. S., and Golowko, N. (2017), Employability skills for the Romanian Outsourcing Industry, in: 2017 The 11th International Conference on business excellence – Strategy, Complexity, and Energy in changing times, March 30-31, Bucharest, Romania, pp. 1068-1080, doi: https://doi.org/10.1515/picbe-2017-0110.

[13] Foerster-Pastor, U. S., and Golowko, N. (2018). The need for digital and soft skills in the Romanian business service industry, *Management & Marketing. Challenges for the Knowledge Society*, Vol. 13, No. 1, pp. 831-847, DOI: 10.2478/mmcks-2018-0008.

[14] Garvin, Peggy. (2009). *Real World Research Skills: An Introduction to Factual, International, Judicial, Legislative, and Regulatory Research*. Alexandria: The Capitol Net Inc.

[15] Hipo.ro (2020). NextGen Career Guide, Retrieved from https://catalyst.docsend.com/view/ 7pyuyhv.

[16] Istudor, N. (2016). Raportul anual al Rectorului Academiei de Studii Economice din București privind starea universității [Annual Report of the Rector of the Bucharest University of Economic Studies on the State of the University]. Retrieved from http://ca.ase.ro/Media/Default/raport/rector/RAPORTUL%20RECTORULUI%202016.pdf.

[17] Istudor, N. (2017). Raportul anual al Rectorului Academiei de Studii Economice din București privind starea universității. Anul 2017 [Annual Report of the Rector of the Bucharest University of Economic Studies on the State of the University 2017]. Retrieved from http://ca.ase.ro/Media/Default/raport/rector/Raport%20rector_final_senat_2017.pdf.

[18] Istudor, N. (2018). Raportul anual al Rectorului Academiei de Studii Economice din București privind starea universității pentru anul 2018 [Annual Report of the Rector of the Bucharest University of Economic Studies on the State of the University 2018]. Retrieved from https://www.ase.ro/2013_files/despre_ase/conducere/pdf/Raport_rector_2018.pdf.

[19] Istudor, N. (2019). Raportul anual al Rectorului Academiei de Studii Economice din București privind starea universității pentru anul 2019 [Annual Report of the Rector of the Bucharest University of Economic Studies on the State of the University 2019]. Retrieved from http://ca.ase.ro/rapoarte-rector.

[20] Mertler, Craig A. (2016). *Introduction to educational research*. Thousand Oaks, California: SAGE Publications, Inc.

[21] Jackson, Denise, Chapman, Elaine. (2009). Business Graduate Skill Sets – Summary Report, The University of Western Australia, Graduate School of Education, https://files.eric.ed.gov/fulltext/ED511910.pdf.

[22] McMurray, S., Dutton, M., McQuaid, R.W., Richard, A. (2016). Employer Demands from Business Graduates, *Education and Training*, 15, 1, pp. 112-132, doi: 10.1108/ET-02-2014-0017.

[23] Mohanu, F., Dima, V. V., Nicolae, R. M., Lorentz, M.-A, Șerban-Oprescu, A. T. (2019, in print). Multiculturalism in Romanian Economic Higher Education. Part II – Eastern Cultural Centres, *Proceedings of the 2nd International Conference on Economics and Social Sciences*.

[24] OECD. (2011). Skills for Innovation and Research, Executive summary, OECD Publishing, Paris, Retrieved from http://www.oecd.org/sti/inno/47164461.pdf.

[25] OECD. Quintini, G. (2014). Skills at Work: How Skills and their Use Matter in the Labour Market, *OECD Social, Employment and Migration Working Papers*, No. 158, OECD Publishing, Retrieved from http://dx.doi.org/10.1787/5jz44fdfjm7j-en.

[26] OECD, Frascati Manual (2015). Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris, Retrieved from https://www.oecd-ilibrary.org/science-and-technology/frascati-manual-2015_9789264239012-en.

[27] Stanciu, S., Banciu, V. (2012). Quality of Higher Education in Romania: are Graduates Prepared for the Labour Market?, *Procedia - Social and Behavioral Sciences*, 69, pp. 821-827.

[28] Pătru, C., Lorentz, M.-A, Dima, V. V., Mohanu, F., Hurduzeu, R.-E., (2018). Lifelong Learning for the Labour Market, in Dumitrescu, D., Zamfir, A. (coord.). 2018. *Proceedings of the 1st International Conference on Economics and Social Sciences*, Filodiritto Publisher, inFOROmatica srl, Via Castiglione, 81, 40124 Bologna (Italy), pp. 334-342, Retrieved from http://icess.ase.ro/index.php/icess-2018/icess-2018-proceedings.

[29] University of Michigan. (not dated). Basic Social Work Research: 7 Steps of the Research Process, University of Michigan Library Research Guides, Retrieved from http://guides.lib.umich.edu/c.php?g=283022&p=1885747.

[30] University System of Georgia. (not dated). Steps in the Research Process, University System of Georgia. Online Library Learning Center, Retrieved from http://www.usg.edu/galileo/skills/unit01/infoage01_04.phtml.

[31] The Wallet. (2018). Topul celor mai bune site-uri pentru a găsi un loc de muncă [Best websites to find a job on], by Oana Voncick, 2018, Retrieved from https://thewallet.ro/topul-celor-mai-bune-site-uri-pentru-a-gasi-un-loc-de-munca/.

[32] Wickam, M. (2015). Enhancing employability skills in graduate business programmes: service-learning in capstone courses, PhD Dissertation, University of Minnesota, https://conservancy.umn.edu/bitstream/handle/11299/177145/Wickam_umn_0130E_16607.pdf?sequence=1&isAllowed=y.

[33] World Economic Forum. (2018). The Future of Jobs Report 2018, Centre for the New Economy and Society, Retrieved from http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf.

[34] Ziarul financiar. (2010). Exclusiv online: Topul celor mai vizitate site-uri de job-uri [Exclusively online: Most visited recruitment sites], 21 July 2010, Retrieved from https://www.zf.ro/business-hi-tech/exclusiv-online-topul-celor-mai-vizitate-site-uri-de-job-uri-6652280.

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The Evolution of Inequalities and the Impact of Education on Economic Growth in Romania

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Abstract

Among the most important economic challenges currently faced by both Romania and other advanced economies is the increase in inequality. This paper aims to address the evolution of inequality over time starting with the global financial crisis until these days by using descriptive methods in order to view the evolution of some economic indicators that measure inequalities and how Romania recently addressed the issue at hand. It is commonly accepted among economists that problems related to measuring inequalities may cause underperformance for both developing and developed economies. Throughout the literature there are also findings that inequality serves as a barrier between economic growth and living standards, generating income largely for those at the top and thus making it more difficult for poor people to make a difference in living standards regardless of the cycle in which the economy finds itself. Among the findings of this paper the lack of investment in human capital and therefore in education stands out even tough starting with 2013 economies have started growing with healthy growth rates.

Keywords: Economic growth, inequality, GDP, GINI coefficient, macroeconomics.

JEL Classification: E20, E60, D63, I24, I25

1. Introduction

As capitalism encourages better results and sustains an enlightenment agenda or freedom of equality, one of the drawbacks of it is the fact that it also increases inequalities of wealth and power. To a certain point, the existence of these inequalities is only natural as it is one of the ways to encourage innovation and progress. Nevertheless, increased inequalities may cause problems for both developing and developed economies. Thus, economic growth has become a simple

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concept for many households in the poverty or middle zone, which seek to increase GDP, productivity, the stock market and corporate profits, while their incomes either stagnate or grow much slower. The global economic crisis that started with the housing bubble in the US in 2008-2009 has brought into the eyes of policy makers, researchers and the general public the problem of economic inequality. One of the issues that the modern-day society must face is to reduce inequality therefore increasing the convergence of the EU member states and even the entire world, in the light of the 17SDGs (Fonseca et al., 2020). This paper aims to analyse how inequalities evolved over time by performing a descriptive analysis, selecting some indicators that reflect this evolution based on professional judgment and also underlines the need for making efforts to pursue growth and address inequality.

Determining exactly why some countries on the globe managed to grow faster than others is arguably one of the main challenges that development economics are facing. Questions that relate include the reason why the West got rich before the rest and also why some developing countries are catching up with the west while others demonstrate a rather slow catching up process. There is little to no consensus reached by economists on the best policies to be pursued in order to obtain sustain rapid economic growth. If one adopts the neoliberal approach, economic liberalization is the basis for rapid growth and reducing inequalities. In contrast, others have given the credit of progress to policy interventions while other voices are stating the idea that foreign direct investments are the key. Nevertheless, in order to attract more FDI`s certain conditions need to be met by the economy beforehand, conditions such as infrastructure, human resources, strong institutions, economic stimuli etc. By taking into account one of the conditions mentioned, in order to develop human capital, education is a prerequisite for evolution.

2. Problem Statement

There are many reasons to examine potential factors leading to income inequality. First, a more equitable distribution of revenues can be a political goal in itself and would indeed gain important global attention in the context of the global financial crisis. There are various channels through which income inequality can affect other macroeconomic variables, in particular economic growth. While some income inequalities may provide incentives for economic activity or minimum capital for certain people according to Barro (2000); Lazear and Rosen (1981), inequality of wealth and income can lead to: insufficient investment in human capital (Galor & Zeira, 1993), inefficient allocation of talent; reduction of aggregate demand (Carvalho & Rezai, 2014); impeding intergenerational mobility (Corak, 2013) and the risk of social stability. Some authors have shown that less equal income distributions are associated with lower average growth such as Ostry, Berg and Tsangarides (2014). Argatu, R. (2018) states that in the absence of coherent strategies individuals' chances of having a good quality life and escape the deficient social situation they are in are hindered, thus also affecting the number of people with access to higher education.

Inequality is affected by a number of factors according to the literature, factors such as economic growth, demographic factors, political factors, cultural factors and factors related to macroeconomics. In the literature on income inequality, the factors related to economic development have undoubtedly received the most attention. These factors are: a country's wealth (mostly measured as GDP per capita), economic growth, technological development and economic structure development. As a country's wealth increases, the wealthiest people and entrepreneurs have more opportunities to increase their income as stated by Chang and Ram (2000). Also, Hadad (2018) states that education, training, technological progress and good governance is taken into account when measuring the degree of competitiveness of a country.

Evidence also shows that inequality reduces the share of the agents that are able to invest in human or physical capital thus correlating inequality in a negative way with economic growth. Example of such papers are Banarijee and Newman (1991) and Galor and Zeira (1993), papers which study the imperfections of capital markets and investments by using moral hazard and risk adverse individuals as sources for the imperfections of the capital markets. Acording to Samad (2020), human capital, social capital, and innovative firm performance are positively and significantly related and thus suggesting the importance of education. Another implication of inequalities studied by Galor and Zeira (1993) is the fact that under the conditions of fixed costs existing in education, the risk of poor households being caught in a poverty trap causing inequality to exist generation after generation increases, thus leading to an inefficient allocation of resources. With regard to political factors, there are voices such as Benhabib and Rustichini (1996) and Grossman and Kim (1996) that state that inequality is correlated positively with socio-political instability due to the fact that the poor may engage in predatory activities at the expense of the richer class. Although theoretical literature on the subject of inequalities is continuously growing, empirical studies has been evolving at a slower pace. The reasoning behind this is the fact that data availability is scarce and there is a high difficulty of finding measures of redistribution that are cross-country comparable especially due to the fact that the fiscal system from a country to another is fairly different. Persson and Tabellini (1994) have found in their model that a negative relationship between inequality and growth does exist.

3. Research Questions/Aims of the research

One of the most important facts regarding inequalities, in order to offer a start point for an analysis is how inequalities have evolved over time, and what did some countries do in order to best tackle it. Also, what other indicators of inequality may be analysed in order to view the problem at its full size? By analysing the evolution of the GINI coefficient, the school dropout rate and the expenditures regarding education as percentage of the GDP in this paper, it is visible that things can be improved even tough steps have been taken in this direction.

4. Research Methods

The goal of the paper consists in providing a transparent view of poverty and social exclusion within a sample of countries with similar economies and also to point out the importance of education on the long run while underlining that both in the past years and nowadays education is underfunded in Romania as opposed to the countries analysed.

In order to obtain the results presented in this paper, an analysis has been made on various indicators in the Eurostat database and also a review on the literature that clearly states issues that inequalities may cause. The time period analysed starts with the beginning of the financial crisis in 2007-2008 and ends in 2018 and 2019 depending on the available data. A larger time period was selected in order to see a clear evolution of the selected indicators for countries with similar economies. The adopted sample consists of the Czech Republic, Hungary, Poland and Romania. The reasoning behind selecting the respective countries is the similarity of the economic structure of these countries, the same structure being used by the National Bank of Romania in their research.

5. Findings

From an economic point of view, if one adopts a Keynesian approach, increasing the minimum wage could instantly decrease inequalities. Even so, by taking this path there is a possibility that could provide an even bigger barrier in terms of reducing poverty due to a possible increase in unemployment. In order to capture the evolution of inequalities a series of indicators have been selected for analysis.

The Gini coefficient is one of the most commonly used measures of economic inequality.

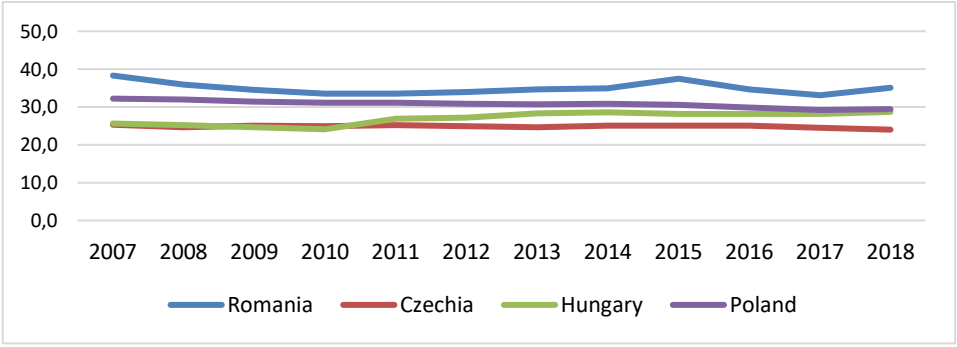

Figure 1. GINI coefficient
Source: Eurostat

Regarding the Romanian economy, it has a fairly high GINI coefficient compared to other European countries. In Figure 1, it can be seen that since 2007, inequalities have been declining, following an increase to 37.4 in 2015. Looking at the figures by comparison, the Czech Republic has a much better evolution regarding the GINI

coefficient managing to keep a fairly constant rate with a slight tendency to decrease while in Hungary it is visible that the inequalities have grown over time in the analysed time frame.

Another indicator that was chosen to be analysed is the "School dropout rate".

The indicator presented in figure 2, shows that Romania does not hold a good position having one of the highest dropout rates from the analysed sample of countries. The indicator has maintained a relatively constant trajectory as both the beginning of the assessed period (2009) and the end (2018) are around 16%. A country that expresses an increasing evolution in the school dropout rate is Hungary. These figures are an indication of the fact that reforms in education are required in order to improve the evolution on the long-term.

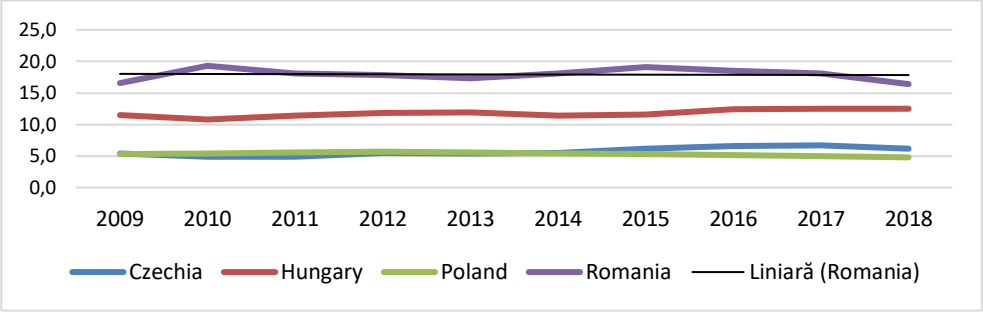

Figure 2. School dropout 18-24 (% of total population)
Source: Eurostat

Looking at the social conditions of a country, usually a country with high inequalities should in theory have a higher school dropout rate due to the poor living conditions. Income inequality and residential segregation might combine to create an inequitable and inefficient distribution of education spending. Also, high inequalities, from a psychological point of view, might cause people to become pessimistic about their future and underinvest in their education. Another indicator that is in correlation with the school drop-out rate and needs to be analysed is the public expenditures with education as percentage of GDP.

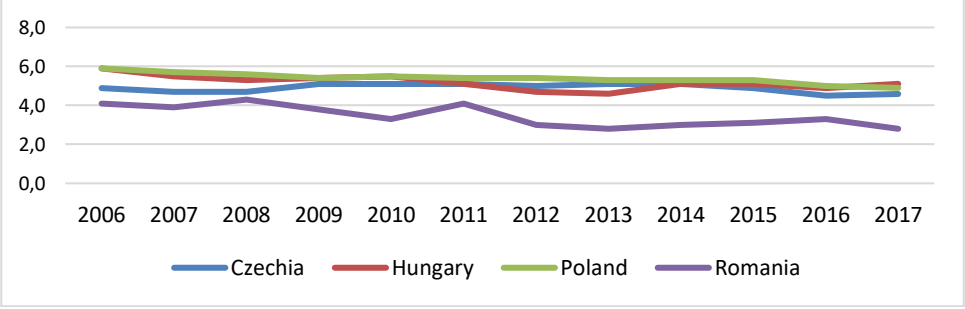

Figure 3. Public expenditures with education as percentage of GDP
Source: Eurostat

For education expenditures, Romania has allocated the lowest percentage of GDP to this sector. In 2017, spending fell to 2.8% of GDP, while countries such as the Czech Republic, Hungary and Poland totalled around 5%, almost double than Romania. The obvious cuts in education spending can be seen from the moment the financial crisis began to take effect, starting with 2009, 2010, the decrease amounting to 1% and then, in 2011 to return approximately to the initial level. However, since 2012, the share of education expenditure has been steadily declining, which may be worrying in the context in which the universally accepted view is that poor education can have a negative influence on future economic growth. Looking at economic growth, it is visible that Romania has one of the highest rate of growth in the entire EU, thus an increase in education expenditures is possible.

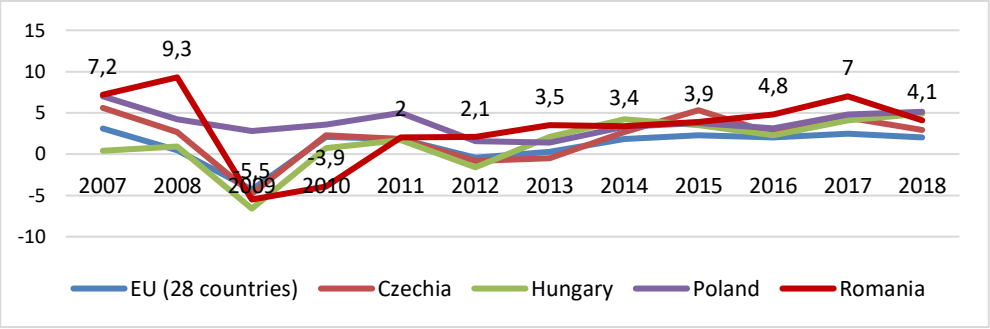

Figure. 4 Economic growth
Source: Eurostat

Starting with 2013, Romania's economic growth seems to be healthier, with approximately constant growth rates, the economy growing from year to year by about 10 billion euro. In 2017, the economic growth was significant, namely about 17 billion euro, as compared to the previous year, where it can be said that the measures taken in recent years by Romania favour a strong and stable economy. Even so, this indicator is not necessarily a clear indication of the fact that inequalities are going well, since Romania is a developing economy, with a lower GDP/per capita compared to other countries.

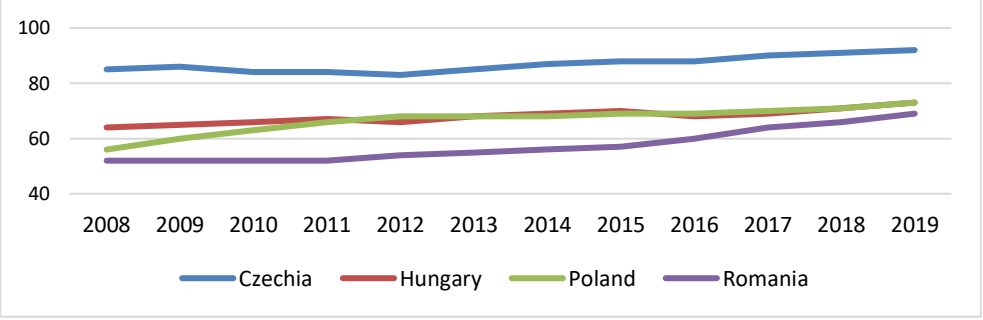

Figure. 5 GDP/Capita in PPS
Source: Eurostat

By analysing Figure 5, it is visible that this indicator is improving and convergence issues between Romania and countries such as Poland and Hungary are decreasing. Starting with 2016, Romania`s GDP/capita faces a more accentuated improvement due to decisions to increase wages in the budget sector and also to increase the minimum wage using the wage-led growth strategy adopted in multiple countries across the EU. By correlating figure 5 with figure 1 and 2 it is visible that the measures adopted were efficient in reducing inequalities.

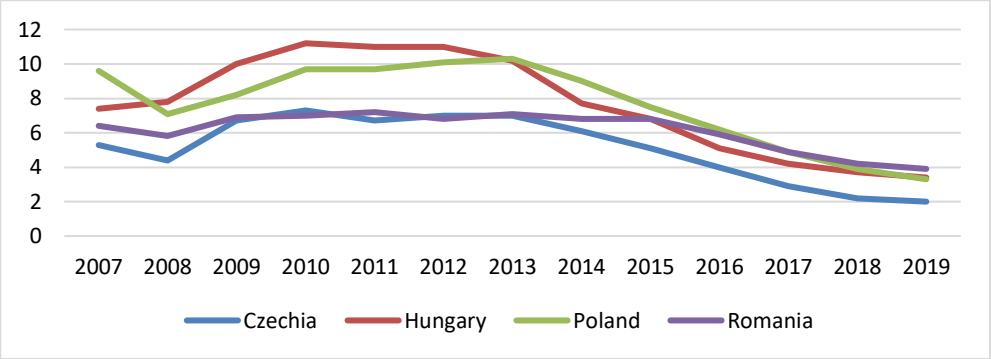

Figure. 6 Unemployment rate – 15-74
Source: Eurostat

Also, taking into account the fact that increasing the minimum wage could provide a barrier in improving inequalities, the unemployment rate was analysed. In the period 2015-2019 Romania unemployment rate evolved in a positive way unemployment reducing by approximately 4% on average as it is visible in Figure 6. By analysing the data, it is visible that the GINI coefficient in Romania needs improvement. Looking at the school dropout rate, all countries could improve in the sense of reducing the number of school dropouts. In order to do so, the state should take measures in order to facilitate access to education and to courses in order to increase the confidence in the education system and in what pupils could accomplish by completing their studies. The school dropout rate could be correlated with the investment in education. By looking at the analysed data, it is visible that Romania has the lowest percentage of the GDP allocated to education while also having the highest school dropout rate. By increasing the percentage of the GDP allocated to education, in theory school dropouts should decrease due to a higher quality education on the medium and long term. Also, by looking at the GDP/capita and the unemployment rate, it is visible that minimum wage increases did not affect the unemployment rate in a negative way while reducing inequalities. Nevertheless, reforms are required in order to reach results more in line with the other countries selected in the sample. Problems like the underdeveloped infrastructure, weak institutions and underdeveloped human capital still need to be addressed by the authorities.

6. Conclusions

It is an acknowledged fact that education has an impact on economic growth. By investing in education, results appear on the medium and long term. More educated people offer more opportunities for research and innovation, thus obtaining better results in all fields of interest. By looking at the evolution over the years, it is clear that from the countries analysed, Romania has a disadvantage. Also, by reducing inequalities and giving everybody more equal opportunities, the wellbeing of the society in general should improve, especially if education expenditures were to increase. Also, considering the fact that numerous authors stated in the literature review state the fact that inequality does represent an impediment in the path of economic development and economic wellbeing, if we look at Romania, we see measures taken in order to reduce inequality. Nevertheless, it is hard to quantify, how much of the decrease in inequality actually is accounted for by the measures adopted by the government and how much is actually accounted for by the evolution of the economy in general. This research states the evolution of the main variables that highlights inequality but in order to build a standing econometric model, access to data and the differences in fiscal policy from the selected countries make this task hard to achieve. This paper may pave the way for future studies regarding the how measures adopted by the government of Romania actually impact the inequalities once more robust data becomes available.

References

[1] Argatu, R. (2018). The role of Romanian social enterprises in the alleviation of poverty and social exclusion. *Management & Marketing. Challenges for the Knowledge Society*, 13(4), pp. 1257-1275.

[2] Banarijee, A., & Newman, A. (1991). Risk bearing and the theory of income distribution. *The Review of Economic Studies*, 58, pp. 211-235.

[3] Barro, R. J., & Lee, J.-W. (2000). *International Data on Educational Attainment: Updates and Implications*. In: Cambridge, Massachusetts Center for International Development, ed. *CID Working Paper*, (042).

[4] Benhabib, J., & Rustichini, A. (1996). Social Conflict and growth. *Journal of Economic Growth*, (1), pp. 129-146.

[5] Carvalho, L., & Rezai, A. (2014). Personal Income Inequality and Aggregate Demand. In: Department of Economics of University of São Paulo (FEA-USP), ed. *Working Papers*, 2014_23.

[6] Corak, M. (2013). Income Inequality, Equality of Opportunity, and Intergenerational Mobility. In: IZA, ed. *IZA Discussion Papers from Institute of Labour Economics*, 7520.

[7] Chang, J. Y., & Ram, R. (2000). Level of Development, Rate of Economic Growth, and Income Inequality. *Economic Development and Cultural Change*, 48(4), pp. 787-799.

[8] Eurostat. Retrieved from https://ec.europa.eu/eurostat.

[9] Fonseca, L. M., Domingues, J. P., Dima, A. M. (2020). Mapping the Sustainable Development Goals Relationships, *Sustainability*, 12(8), 3359, Published: Apr. 2020.

[10] Galor, O., & Zeira, J. (1993). Income Distribution and Macroeconomics. *The Review of Economic Studies*, 60(1), pp. 35-52.

[11] Grossman, K. (1966). Predation and accumulation. *Journal of Economic Growth*, (1), pp. 333-350.

[12] Hadad, S. (2018). The geographic distribution of Knowledge Economy (KE) within the European Union (EU). *Management & Marketing. Challenges for the Knowledge Society*, 13(3), pp. 1089-1107.

[13] Lazear, E. P., & Rosen, S. (1981). Rank-Order Tournaments as Optimum Labour Contracts. *Journal of Political Economy*, 89(5), pp. 841-864. Retrieved from http://www.jstor.org/stable/1830810.

[14] Ostry, J. D., Berg, A., & Tsangarides, C. (2014). Redistribution, Inequality, and Growth. In: International Monetary Fund, ed. *IMF Staff Discussion Note 14/02*. Retrieved from https://www.imf.org/external/pubs/ft/sdn/2014/sdn1402.pdf.

[15] Persson, T., & Tabellini, Guido. (1994). Is inequality harmful for Growth. *The American Economic Review*, (84), pp. 600-621.

[16] Samad, S. (2020). Achieving innovative firm performance through human capital and the effect of social capital. *Management & Marketing. Challenges for the Knowledge Society*, 15(2), pp. 326-344.

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Educational Assessment Typologies within the Technological Context: 2020 Challenges

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Abstract

The paper focuses on the current obstacles facing education nowadays, especially given the atypical circumstances with which academia must come to terms in 2020. A long-time avoided element of the didactic process, every so often even feared by a significant portion of foreign language teaching practitioners, assessment should – as shown in this study – enjoy centre-stage status, as the effective and transformative learning tool that it is. By providing a much-needed review and categorization of existing and possible assessment approaches, with an emphasis on the teaching of foreign languages for business communication, the current paper strives to highlight the potential of the various assessment techniques and their digital applicability, especially in the current context of the challenges posed by distance and blended learning. The long-term effects towards personal change and a better understanding of one's individual skills and capabilities among students that assessment (when applied right in the classroom) can provide are vital and might result in the training of more capable businesspeople and entrepreneurs for the challenges that tomorrow's global market will generate.

Keywords: Assessment, education, technology, challenges, teaching practices.

JEL Classification: A12, I2, I20, I21, I23, Z13

1. Introduction: Assessment as a tool for the future

1.1 The importance of assessment

Assessment is one of the most critical elements of the curriculum since it gives quality to the whole teaching-learning process. The assessment of academic learning refers to the systematic and continuous process by which the extent to which learning objectives are being achieved is determined. This process has a primary function in the teaching-learning process because it is what gives the process its feedback. Assessment affects not only the students' learning process but also the teaching process and academic institution's curricular projects.

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If, as a result of the assessment, we discover that the objectives are being achieved to a much lesser extent than expected or not being achieved at all, what must be done is a review of the plans and activities that are being carried out, as well as the attitude of both teacher and students, together with the suitability of the objectives set. All this will result in a readjustment that will strengthen the teaching-learning process; it is how assessment performs its feedback function (Heywood, 2000).

1.2 Functions and types of classical assessment

Assessment clearly serves two functions, as follows: on the one hand, it has to adjust the pedagogical support to the students' individual needs through progressive approaches, which would imply carrying out initial and formative assessments; on the other hand, the assessment must determine the extent to which the intentions of the project have been achieved, which implies carrying out a summative or final assessment.

Given the distinctions above, we can differentiate between three types of assessment: initial or diagnostic assessment, formative assessment, and summative or final assessment.

Initial or diagnostic assessment is a process that aims to determine:

a. If students meet the requirements necessary to start studying a unit or course.

b. To what extent the students have already achieved the objectives proposed in that unit or course (knowledge, skills, etc.).

c. Each student's individual situation: the physical, emotional, and familial state in which students find themselves at the beginning of the course or at a particular stage.

If we analyse the aspects that are meant to become known through the diagnostic assessment, we will realize that, due to its fundamental background nature that the teacher needs to take into account before performing any activity, the diagnostic assessment should be carried out at the beginning of the course and also at the beginning of each unit, if considered convenient.

Something of great importance will be found in the data that can be gathered through the diagnostic assessment about our students' family, physical, and emotional situation; thanks to this knowledge, we might be able to take action and respond to each of their unique circumstances.

Formative assessment is a process that aims to:

a. Inform both student and teacher about the progress made by the former.

b. Locate the deficiencies observed during a teaching-learning topic or unit.

c. Assess intermediate student behaviours to discover how the objectives set are being partially achieved.

Due to its characteristics, formative assessment will take place at the end of a topic, a unit, or at the end of a series of activities on whose success the success of subsequent activities depends.

Formative assessment also has an especially important role in the teaching-learning process, since it is responsible for guiding the activity through its reports on how the objectives are achieved. If the formative assessment indicates that the objectives are being met, the teacher and students will have a sufficient stimulus to move forward. If the formative assessment shows deficiencies or gaps in terms of the objectives set to be achieved, it will be time to make corrections and necessary adjustments to the plan, further motivate the students, and examine whether the objectives set are the most appropriate for that precise stage in the teaching-learning process (Heywood, 2000).

Final or summative assessment is a process that aims to:

a. Assess the final behaviour or behaviours observed in the student at the end of the process.

b. Certify that the objectives set have been achieved.

c. Make a recap or integration of the learning content developed throughout the course.

d. Integrate the various value judgments that have been issued on a specific individual throughout the course into a single one.

Given its characteristics, the appropriate time to carry it out will be at the end of a unit or entire school year. It is all about corroborating what has been achieved, which will not be new for teachers and students since, by the time the summative assessment is due, they will already have sufficient data gathered from formative assessments. If at the time of the summative assessment, the results are unexpected, it might be necessary to distrust the validity of the formative assessments and make the necessary readjustments (Heywood, 2000).

2. Problem statement: The opportunity of alternative assessment

Classical forms of assessment have (this year more than anytime) shown their limitations. Educators have been compelled to devise or adopt new forms of assessment in order to adapt to new, quarantine-moulded, online circumstances. We felt the need to empirically filter these alternative forms with respect to their usefulness in the given 2020 context.

New developments in assessment have brought to the education field what is known as an *alternative assessment*, which refers to the new procedures and techniques that can be used within the context of teaching and incorporated into daily classroom activities.

Unlike traditional assessment, alternative assessment allows for the following:

- Focusing on documenting the evolution of the individual over time, rather than comparing students to each other.
- Emphasizing the strength of the students instead of their weaknesses.
- Considering learning styles, language skills, cultural and educational experiences, and levels of study.

Critics argue that traditional fixed-response exams do not give a clear and truthful view of what students can bring in via their knowledge, but only allow for memorization and evaluate the understanding or interpretation of knowledge but do not demonstrate the ability to use said knowledge. Besides, it is argued that standardized fixed-response exams ignore the importance of holistic knowledge and knowledge integration and do not allow for the assessment of the student's competence in high-level thinking educational objectives or what society expects. In addition, the result of the assessments is often used solely to grade the participants and remains otherwise isolated from the teaching and learning strategies (Shewbridge, 2014).

2.1 Mind maps

Maps are mental representations; they are the image that the person builds on the meaning of knowledge. The same information can be represented in many ways since it reflects the individual or group's cognitive organization depending on the way in which the concepts or knowledge were captured, which makes its assessment a bit difficult, especially if comparisons between individuals or groups are to be made.

The mind map consists of a diagrammatic representation that organizes a certain amount of information. It is part of a central word or concept (in a box, circle, or oval), around which 5 or 10 ideas or words related to that concept are organized. Each of these 5 or 10 words can become a central concept and continue adding
ideas or concepts associated with it (Tahlil, 2020).

2.2 Problem-solving

It is a fact that confronting the reality of everyday life challenges us to focus on problems and conflicts to which acceptable solutions must be found in a given context. The problem-solving process involves a series of skills that must be developed and assessed in academic preparation.

Problem-solving is a cognitive activity that consists in providing a product-response starting from an object or situation in which one of the following conditions exists:

- The object or situation, and the class to which they belong, have not previously been in a learning situation.

- Obtaining the product requires the application of a combination not yet learned of rules or principles, previously learned or not.
- The product and the class to which it belongs have not been encountered before.

2.3 The case method

Another method that has been associated with and that offers support to the use of the problem-solving technique is the *case method*. In the case of this method, assessment is done by recounting a situation that was carried out in reality, in a context similar to the one in which our students are or will be immersed and in which decisions will have to be made.

The story must contain sufficient information related to facts, places, dates, names, characters, and situations.

2.4 Projects

The project consists in the making of a product over a long period of time. Apart from demonstrating their knowledge of specific subjects, the students' ability to assume responsibilities, make decisions and satisfy individual interests can be assessed.

The teacher can provide the student or team of students with some recommendations to ensure the proper implementation of the project, such as: define the purpose of the project and relate it to the instructional objectives, give them a written description of the materials they can use, the necessary resources, instructions, and assessment criteria. We can also promote creativity by giving them a little bit more freedom to decide and by offering them a little less direction.

In the case of research projects, the teacher usually offers the topic that needs investigating. The primary skill to be assessed with this technique is obtaining information and organizing it in such a way that it makes sense according to the objective set at the beginning of the project (Murchan, 2017).

2.5 The journal

The use of the journal focuses on techniques for observing and recording events; it is about capturing the personal experience of each student, during certain periods and/or activities.

The journal is a technique that is mainly used for self-assessment; however, it can be reviewed by the teacher if it is so stipulated from the beginning and the aspects to be assessed made clear. Students can use a given space to write down their doubts, name the parts that caused confusion, and make comments or give their opinions on what they learned, so the teacher will take time every day or week to address these doubts in class. It is recommended that a few minutes per day (at the end of each class) are dedicated to organizing the contents of the journal (Shewbridge, 2014).

2.6 Debating

Debating is a technique that is often used to discuss a topic. There are different ways to implement the technique; one of them is grouping the students in pairs and assigning them a topic so that they first discuss it together. Subsequently, before the group as a whole, a student is asked to argue on the topic to be discussed; once the teacher grades the performance, their partner must continue. The rest of the students should listen carefully and take notes to discuss the content (Zechner, 2020).

Another way to work the debate in the classroom is to separate the group into two parts; randomly ask a team to look for arguments to defend the content of the topic and the other team to be against it. After a while, each team should try to convince the other of the value of their stance using objective arguments, examples, allowing others to speak, respecting opposing views, and keeping an open mind (OECD, 2011).

The teacher will guide the discussion and freely observe the behaviour of the students, grading the aspects that have caught their attention and allow for more focused observations later, as in the following cases: if a student does not participate, if a student gets angry and attacks others, if a student looks fearful, distressed, etc.

2.7 The technique of the question

The technique of the contextualized question for assessment functions plays a vital role since, according to its design, students can obtain information on concepts, techniques, cognitive skills, feelings, experiences, etc. indicative of short- or long-term memory. Also, the content-related level of information processing that the students display might vary.

The questions used to assess metacognitive abilities must be asked in such a manner that they require the description of the processes used when thinking, the list of steps followed in the use of a strategy that allowed individual achievements, and the recognition of the aspects that were easy to solve and the problems that arose in the resolution of a problem or decision making.

2.8 The portfolio

The portfolio is an assessment method used to monitor the evolution of the learning process by the teacher and even the student so that changes can be introduced during said process.

It is a way to gather information that demonstrates the students' abilities and achievements, the manner in which they reason, ask questions, analyse, synthesize, produce or create, and interact (intellectually, emotionally, and socially) with others, allowing teachers to identify the students' learning of concepts, procedures, and attitudes. It can be used in the form of assessment, co-assessment, and self-assessment. The use of this resource allows the assessment of the learning process to be monitored so that changes can be made to it.

Assessment means consolidating learning, as well as achieving the desired objectives in any field of study. Assessment makes it possible to identify which priority needs must be met and − from the educational perspective − is supposed to show congruence between knowledge and performance, which is the golden formula that might lead to the so-called high-quality education. That is why assessment should be considered an extension of the teaching and learning process and not just another step − that is, it should be viewed as an ongoing activity, an integrating process that generates training opportunities by reflecting experiences (Heywood, 2000).

One of the topics that needs reflecting on is the pedagogical strategy of teacher support and how it can contribute to achieving the objectives set. In this sense, new assessment approaches must discard traditional definitions; nowadays, assessment results should not have any punitive effect, but instead, they should be considered as inputs that allow for a redesigning of didactic strategies. To the extent that educational assessment self-regulates, the quality of the results will undoubtedly improve.

3. Aims of the research: Theoretical knowledge as a solution to real-life situations. From practical tradition to utilitarian modernity

A useful technique to teach critical thinking is based on using real cases and solving them in groups through analysis, brainstorming, innovation, and creative ideas. Although the method itself is a structured one, in practice, it is quite disorganized since it deals with real problems about which, in most cases, there is not enough information, and the conclusion is that there often is no possible solution (Heywood, 2000).

However, the case method prepares students for the real world and awakens their curiosity, analytical skills, and creativity, which is very useful when the goal is not only that of producing proficient language speakers but also training future entrepreneurs with a knack for solving complicated real-life business scenarios (OECD, 2011).

This technique can be easily paired with that of asking students to resort to social media, or instance checking the tweets of their favourite artists and correcting their grammatical errors in order to reinforce their language skills.

3.1 A perpetual teaching statement

Teaching is a complex activity that gets the teacher and the students involved in a dynamic sort of interaction, which is conditioned by the institutional, cultural, and family environment of both parties. It is and should be, a dynamic activity based on dialogue, mutual respect, and an underlying interest in both parties to teach and learn, respectively.

It is challenging to teach something. There are no universally applicable mechanisms or methods to do so. It all varies greatly and depends a lot on the subject, content, degree of abstraction, and complexity of the knowledge imparted

(Duffy, 2004). Consequently, from the point of view of the teacher, it is necessary to explore different possibilities and offer students multiple learning options. It is implicit that the latter must possess the will to explore the options provided, looking for those that are more advantageous in their situation. That is why it is of utmost importance to establish a dynamic of dialogue and tolerance between the parties involved in the teaching-learning process.

On the other hand, it is often easier to learn something than it is to teach it. Every day we learn new things, especially if we maintain an open, observant, critical attitude and pay attention to the world. How we learn and how well is, however, a more complicated question.

In short, the teacher hardly "teaches" the student as much as the latter learns something as a result of proper guidance and masterful technique. If the teacher, through their teaching activity, enhances and facilitates the learning of their students, then the process can be defined as successful. How successful? Well, the answer is again complicated and elusive, and long-term results should be weighed in. It would probably be more productive if students stayed away from this manner of defining the teaching-learning process as "the teacher teaching the subject." (Gardner, 2014) Ultimately, the final repository of knowledge and the one who must develop the cognitive skills and practical, real-life problem-solving competences is the student. The more significant part of the responsibility to learn falls on the students' shoulders.

We believe that teaching and learning are active processes of personal change, which is only possible through the effort and dedication of each person within a climate of trust that stimulates interaction and dialogue between students and teachers. This interaction is carried out through different teaching-learning methodologies that emphasize the involvement of students. We do not consider the students to be mere spectators to the teaching process, but the active constructors of their own training.

The discussion of practical problems, exercises, simulations, conferences, and research are the main pedagogical tools used, so that each student is their own actor, in the course of the learning cycle: experience, reflection, conceptualization, and application.

4. Research methods: Challenges and opportunities of teaching: 2020 edition

The pandemic generated by COVID-19 and its immediate consequences (i.e., the sudden cessation of all face-to-face teaching activities) have been a significant challenge for everyone, both teachers and students, on various levels and because of several factors.

The lack of any sort of warning or time to prepare was probably the worst aspect of this change. The fact that it all happened so suddenly tested everyone's adaptability and swiftness to react. One day we were each enjoying our peaceful educational comfort zone, in which everything flowed at the rhythmic pace of the

academic year plan, and the next, the university was closing its doors, and we were expected to continue all our teaching online.

At the Bucharest University of Economic Studies, we were among the lucky ones, so to speak, because in recent years our institution had invested in technology and set up a blended learning platform, thus promoting and encouraging the use of ICT, mobile devices, as well as educational and recreational applications, launching communication channels through various official websites and accounts on several social media platforms. All this has allowed for the impact of the coronavirus-imposed cessation of all face-to-face teaching to be minimized. There is an enormous amount of resources that the teachers/professors/tutors can use thanks to the internet, which goes beyond our students' immediate academic interests, but which are an inherent part of lifelong learning and especially relevant, namely cultural resources. As a result of the pandemic, acts of transnational generosity and a renewed sense of community made it so that a wide array of online resources became available for free: it is now possible to access libraries, museums, film libraries, the work of public entities and audiovisual companies, writers, artists, musicians and sportspeople, associations of all kinds, individuals, etc. (Adeoye, 2020). At this time of need, people are literally giving away their work in an invaluable act of altruism, for the advancement of knowledge.

5. Findings: Advantages and disadvantages of remote education, and a prescription

This process becomes more critical every day because to be active in the new social space, new knowledge and skills are required and will have to be learned as part of the educational process. In addition, the school and the university must take on both the training itself and the dynamics of the new social space, which requires creating educational strategies for distance learning, as well as designing new scenarios, instruments, and methods for educational practices.

The multimedia environment is not only a new medium of information and communication, but also a space for interaction, memorization, and education. This is precisely why it is a new educational space and not merely a means of information or communication. As such, in order for the teaching process to be successful, educators must design new educational scenarios and actions; that is, that they propose a specific educational policy for the cyber environment (Bearman, 2020).

The main **advantages** of distance education are the following:

- The possibility of tending to precise educational needs that were not met in ordinary circumstances within the conventional education system.
- It eliminates the difficulties posed by geographical distances, where the population can access this type of education, regardless of where it resides. This is alluded to by most people who use this method.

- It is especially useful for improving the academic and professional qualifications of the adult population, not just the young.
- The hourly flexibility of the system also facilitates the organization of students' time, respecting family life, and work obligations.

Some of the **disadvantages**:

The distrust generated among the students due to the lack of communication between them and the teacher, especially when it comes to the process of learning and academic assessment.

By eliminating face-to-face social interaction, it is possible that the students might become isolated, discouraged, alienated, or even severely depressed, so active steps in order to avoid this should be taken by the teacher.

Generally, changes made in the direction of embracing the distance learning system require that the students do most of the adapting: they must learn to use specific teaching materials and virtual classrooms to communicate with their teachers and other students through the new media. They must be able to organize their study time to balance their personal, professional, and academic life.

There are other specific disadvantages inherent to the nature of the different academic disciplines. That is the case of language teaching (the subject that I teach) − where despite all the e-learning tools that are supposed to guarantee that teaching is as effective and attractive for the student as possible −, which, done remotely, remains unable to convey all the nonverbal aspects of successful communication.

The information society requires a new type of literacy, the acquisition of new skills, and aptitudes allowing one to navigate the cyber space competently. The emergence of the virtual educational environment translates to an expansion of reality. Just as towns, cities, and states have created new forms of social reality, so too has this environment created new scenarios and possibilities that are real because of their impact on society and on people, even when they occur in a medium that is not physical and corporeal, but electronic and representational. As technology becomes ubiquitous in our lives, because of the Covid-19 crisis, we must learn to ride this wave (as the young like to put it) by embracing and eventually being able to master all the new avatars of teaching and the educational process in its entirety (Zaphiris, 2020).

As far as good distance-learning practices are concerned, things are a little more nuanced that one might initially believe. It is not enough that one has access to resources and imparts them to one's students; one must also know what to do with them (Elken, 2020). One can send a recording to one's students, provided you also send them an email with instructions, keep in touch with them, and remember to remain available. The personal touch is an essential element of online education; if teaching professionals ignore it, students end up feeling isolated, so teachers must find a way always to foster a sense of togetherness. If this approach is applied correctly, the physical distance between teachers and students should not be an obstacle, and, in some fortunate cases, the two parties (the educator and the educated) might even grow closer than ever before (Uskov, 2020).

Well conducted, the experience does not have to detract from face-to-face training. The online platform, the interaction through a microphone and camera, and the student's responsibility to do autonomous work in a way that they are not used to are all profitable training opportunities for those who might choose to work from home in the future. In a way, it becomes a training practice for the teleworking system that is gaining more and more momentum in many professional sectors of the professional world.

The possibilities that open up with digital teaching are numerous: not only can you upload a document and work with students on a practical case study live, approaching the solution together, it also allows all synchronous (or live) sessions to be recorded and available to the student, for as long as they endure on the university's servers. Another of its advantages is the ability of these tools to integrate well with each other.

Throughout this whole process of digital transition, as well as in the medium- and long-term future, the biggest obstacle (but also the most exceptional opportunity) remains the human factor. There will be those who, throughout this period of crisis, make the least amount of effort, but there will also be those who soak it all up and really take advantage of the opportunity − both teachers and students. We are convinced that this is a turning point for education: there will be a before and an after; from this point forward, the use of technology to learn and teach remotely will undoubtedly be incorporated into our lives, and things will never just 'go back to the way they used to.' Now is undoubtedly the ideal time even for those who have never dared to teach in any other way − who have never experimented with methodologies such as the flipped classroom or tried any of the many educational apps that exist − to get out of their comfort zone and become better teaching professionals.

6. Conclusions

There are no exclusive methods to teach. It depends on the subject, the content, the degree of abstraction sought, and the level of complexity of the subject that is being analysed. Hence, it is necessary to explore different possibilities and options. As it is expected that the result of this interaction will be students willing to explore the options looking for those that are more favourable, the dialogue between the student and the teacher is a fully established link. The act of teaching must highlight the essential aspects, which promote the transformation and improvement of the environment in which we develop as individuals and adapt to a specific type of society.

For us, a teacher must be concerned with the degree of learning that the students can reach, making sure that the techniques used are the most appropriate for one particular group or group member, and ensuring that the student can express their concerns regarding their expectations from or requirements of the course. As such, the student will cooperate in the creation of a better course to the benefit of the entire group. Our teaching philosophy seeks to remedy the problem that we commonly encounter, that of the gap between the knowledge imparted and

the students' ability to remember it and render it useful in day-to-day situations. The knowledge is significant when it says something to the student, providing the possibility of solving a problem or understanding a problem and being able to devise a solution to it. In conclusion, our teaching philosophy translates into putting as much emphasis as possible on the learning progress of each of our students in order to help each and every one of them better themselves and each other.

References:

[1] Adeoye, B. F., & Arome, G. (2020). *The roles of technology and globalization in educational transformation*.

[2] Assessment in education: principles, policy & practice. (2000). S.l.: Routledge.

[3] Bearman, M., Dawson, P., Ajjawi, R., Tai, J., & Boud, D. (2020). *Re-imagining university assessment in a digital world*.

[4] Duffy, T. M., & Kirkley, J. R. (2004). *Learner-centered theory and practice in distance education: Cases from higher education*. Mahwah, N.J: Lawrence Erlbaum Associates.

[5] Elken, M. (2020). *Quality work in higher education: Organisational and pedagogical dimensions*. Cham: Springer.

[6] Gardner, J. (2014). *Assessment in education: 2*. Los Angeles: Sage Reference.

[7] Heywood, J. (2000). *Assessment in higher education*. Philadelphia, Pa: Jessica Kingsley Publishers.

[8] Murchan, D., & Shiel, G. (2017). *Understanding and applying assessment in education*.

[9] Organisation for Economic Co-operation and Development. (2011). *OECD reviews of evaluation and assessment in education: Sweden 2011*. Paris: OECD Pub.

[10] Shewbridge, C., Bruggen, J. C., Nusche, D., Wright, P., & Organisation for Economic Co-operation and Development. (2014). *OECD reviews of evaluation and assessment in education*.

[11] Tahlil, T., In Kamil, H., In Asniar, & In Marthoenis, (2020). Aceh International Nursing Conference, *Challenges in nursing education and research: Proceeding of the Second Aceh International Nursing Conference 2019 (2nd AINC 2019*), August 21.22.2019, Banda Aceh, Indonesia.

[12] Uskov, V. L., Howlett, R. J., & Jain, L. C. (2020). *Smart Education and e-Learning 2020*.

[13] Zaphiris, P., Ioannou, A. (2020). LCT (Conference) & International Conference on Human-Computer Interaction. *Learning and collaboration technologies: Human and technology ecosystems: 7th International Conference, LCT 2020, held as part of the 22nd HCI International Conference, HCII 2020,* Copenhagen, Denmark, July 19.24.2020, Proceedings. Cham: Springer.

[14] Zechner, K., & Evanini, K. (2020). *Automated Speaking Assessment: Using Language Technologies to Score Spontaneous Speech.*

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Social Entrepreneurship Education in Academia: A MOOC Scheme Analysis

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Abstract

Social entrepreneurship has started to gain some traction into the higher education, being seen as a key value creator for economy, society and environment. While the world is changing dramatically, the education system cannot keep the pace with this dynamic transformation. Social entrepreneurship education can come as a salvageable solution through which people acquire those skills and understanding necessary to live a good, meaningful and fulfilling life in harmony with the planet. The paper attempts to investigate the characteristics of social entrepreneurship education in academia using qualitative data from the Massive Open Online Course (MOOC) learning platforms. Additionally, the factors explaining social entrepreneurial behaviour of higher education institutions are explored for those universities that display interest in social entrepreneurship MOOC programmes. The paper employs desk research as main method for reviewing previous findings and analysing qualitative data on social entrepreneurship education provided via the universities' MOOC platforms. The research shows that generally universities experiment different schemes of social entrepreneurship education delivered online, which vary, for example, relative to the thematic areas, emerging issues, technology used. The research findings show that commitment toward building sustainable innovation and sustainable social enterprise, interest in understanding, building and measuring social impact, and drive for generating change for a better world and greater good are among the main characteristics of social entrepreneurship MOOCs. These findings need to be further tested empirically using quantitative data.

Keywords: Social entrepreneurship education, university, MOOC, social entrepreneurial behaviour, online learning.

JEL Classification: I23, O35, L31

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1. Introduction

In order to build a long lasting and unique competitive advantage, higher education institutions, like any business organization, have to dedicate themselves to innovation and end-to-end responsibility, capable to guarantee a healthy educational system and a wealthy research process. This means that they have to adopt an entrepreneurial way of thinking, fully adequate and efficient for the foreseen global economic state and societal challenges of the years to come, which takes years to implement such changes (Kanter, 2010; Tierney, 2011; Bratianu et al., 2020). In the future, the main differentiation among universities will consist in the presence or absence of true end-to-end social responsibility and real capacity of innovation (Kanter, 2010; Hadad, 2017). Social entrepreneurship in higher education institutions is an area of enormous potential, which has not received enough attention until now (British Council, 2017). In recent years, universities have stepped into this field, offering the students multiple open online opportunities to get degrees at undergraduate or master level, or simply join the courses of interest and learn (Dargaud & Jouneau-Sion, 2020).

The present paper attempts to open up some avenues of inquiry for social entrepreneurship theory development and practice, particularly in higher education institutions. The main goal of the paper is to awaken academic curiosity for the thematic areas and content of the social entrepreneurship education provided via Massive Open Online Courses (MOOCs) in universities, using a qualitative analysis. Additionally, the paper researches the key factors that explain social entrepreneurial behaviour in the higher education institutions providing social entrepreneurship MOOCs. To achieve these objectives, the paper employs an extensive review of the relevant literature and desk research as main method for analysing qualitative data on social entrepreneurship MOOCs.

The reminder of this paper is structured as follows. The first part introduces various definitions of social entrepreneurship with a particular focus on higher education. It explains the particularities of social entrepreneurship education in universities, arguing on the necessity and benefits of such type of education at the tertiary level. Then, the research methodology is introduced. The last part reveals the results of the desk research employed. A specific focus is placed on presenting the main determinants of the social entrepreneurial behaviour in universities included in the analysis. The paper ends with a section of conclusion, establishing directions for future research.

2. Problem Statement

Social entrepreneurship is a concept that has captured the imagination of many researchers, academics, policy-makers, but also non-profit organizations, in recent years. Specialty literature acknowledges social entrepreneurship as an emerging area of investigation within the entrepreneurship research and social management literature (Alvord et al., 2004; Weerawardena & Mort, 2006). However, while the literature has grown significantly over the last few decades, substantial controversy

remains in the conceptualization of the social entrepreneurship construct in higher education (Păunescu & Cantaragiu, 2013).

As per Leadbeater (1997) ”social entrepreneurship may be expressed in a vast array of economic, educational, research, welfare, social and spiritual activities engaged in by various organizations” (cited in Păunescu et al., 2013, p. 56). Over the years, researchers have attempted to define the concept of social entrepreneurship in different contexts, including the public sector, higher education institutions, community-based organizations, not-for-profit companies, charities, and other non-governmental organizations (Thompson et al., 2000). As Choi & Mahumdar (2014) noted, social entrepreneurship is emerging as an innovative approach for dealing with wicked situations or complex social needs, especially in diminishing public funding. But the question is with understanding what makes this approach of social entrepreneurship so promising. The ways in which it is understood are so many, that the concept needs to be clarified and the role of social entrepreneurship education, particularly in higher education, brought to the frontline.

Some scholars acknowledge that ”even though there is a substantial body of literature on social entrepreneurship emerging from a number of domains, the literature is fragmented and has not led to a development of an empirically derived coherent theoretical framework” (Păunescu et al., 2013, p. 57). Over the years, government agencies and non-governmental organizations (such as community foundations and charities) invested substantial sums of money to identify social needs, create solutions for them and generate change, but they have failed in terms of efficiency of their efforts and sustainability of their social innovation actions. Major social sector institutions, under the existing legislative framework, are often viewed as inefficient, ineffective and unresponsive in this respect (Păunescu et al., 2013). As such, universities have shown to be concerned with the promotion of social entrepreneurship and education regarding social innovation competences by changing their curricula and implementing activities in which students get involved with communities that are in need of some type of assistance and expertise (Cantaragiu et al., 2014). Moreover, there have been a lot of attempts to develop social programs in universities to support people’s social needs, such as: Social Enterprise Program – Colombia Business School; Initiative on Social Enterprise – Harvard Business School; Centre for Social Innovation – Stanford University, Social Impact Award – Vienna University of Economics and Business, to name a few of them, the most known initiatives. The projects hosted by the programs can be rooted in different fields, like poverty reduction, human rights, life quality, equal opportunities, care and health, green environment, and others.

Therefore, social entrepreneurs are needed to develop social entrepreneurship education programmes for a new century. According to Păunescu et al. (2013) a university that is not entrepreneurial is more likely not to be competitive in the new market of higher education and will not survive in the newly created environment based on extreme competition and high demand for internationalization. Recently, more and more universities have become aware of the need to embrace social objectives while building their identity on the market and acknowledge the need to

have an impact on communities in which they are present. Moreover, social entrepreneurship education can increase the propensity of students to launch social enterprises through a process of experiential learning in which students co-create shared communities of practice (Hockerts, 2018). As there are changes in every day of our lives, social entrepreneurship education is also subject to continuous change in terms of learning tools and pedagogies, people attitude and behaviour and approaches of finding solutions to society's problems. As such, social entrepreneurship education is considered a challenging new way to change society, to reshape customers' behaviours and to create social value such as community collective management and development and sustainability (Păunescu & Cantaragiu, 2013).

In recent years, universities have started to think of new opportunities for students interested in learning about social entrepreneurship, by developing relevant MOOCs (Watters, 2012; Dargaud & Jouneau-Sion, 2020). MOOC is an example of social innovation in universities that makes education more accessible to those who have previously been denied this opportunity. The evolution of MOOCs has been strongly supported by the advances in technology (Watters, 2012), which is used in order to enhance the way in which lessons are taught and to stimulate cooperative learning in which one student can teach another one. The main benefits relate to eliminating the restrictions on access to education and therefore granting more chances to an extensive number of persons to take advantage of it. The main innovations that are brought by MOOC, as compared to traditional education, consist of the balance of power that now inclines towards the student, as enrolment is open and students choose purely intrinsically whether they want to attend the course or not (Vardi, 2012). Also, if they do so, students are in charge of when they want to study, what they want to learn and how much.

3. Research Questions/Aims of the research

The purpose of this research is to advance the conceptualization of social entrepreneurship in the area of higher education. Particularly, the paper attempts to investigate the characteristics of social entrepreneurship education in academia using qualitative data from the MOOC learning platforms. Additionally, the key factors explaining social entrepreneurial behaviour of higher education institutions are explored for those universities that display interest in social entrepreneurship MOOC programmes.

Two research questions are of interest in this study:

1. What are the thematic areas and content elements of social entrepreneurship education provided via MOOCs in universities?

2. What drives the social entrepreneurial behavior of universities to develop and provide social entrepreneurship MOOCs?

4. Research Methods

To achieve its objectives the paper employs a qualitative analysis based on secondary data. It mainly relies on the literature review of the recent literature on business education management, academic and social entrepreneurship, and MOOCs. Furthermore, the paper employs desk research as main method for analysing qualitative data on social entrepreneurship MOOCs. The qualitative data for our study come from the MOOC platforms that offer courses and programmes in social entrepreneurship. The 'total population' of MOOC platforms analysed in the present paper consists of the ten most popular platforms for online courses, as acknowledged by BestColleges (www.bestcolleges.com/blog/platforms-for-online-courses/). The method of sampling applied is purposive sampling, a non-probability technique, the 'sample' being selected based on certain criteria to fulfil the requirements of the research. These requirements include: the course title or course outline has to contain key words such as 'social entrepreneurship', 'social entrepreneur', or 'social enterprise'. The materials under scrutiny also include the vision and mission statement documents of the universities included in the research (universities that offer social entrepreneurship MOOCs), which can be found on their official webpage. The data have been scanned manually using an Excel spreadsheet for the identification of patterns and extraction of those elements that are pertinent to the study at hand. The major part of the information was collected from the MOOC platforms and official sites of the universities investigated. Consequently, the current research findings rely upon the accuracy and completeness of data available on the websites, which means that some observations or comments made in the paper may not reflect entirely the reality of the situation exposed and cannot be generalized.

5. Findings

This section discusses the thematic areas and content elements of social entrepreneurship education delivered via MOOCs in academia and the key factors that determine the social entrepreneurial behaviour of those universities, based on the data summarized in Table 1. As the current societal challenges raise the imperative for organizations to develop for their employees appropriate skills and competencies necessary to deal with nowadays' and future challenges, we question about the role played by universities in this respect as the key provider of entrepreneurship education. This role regards provision of graduates with entrepreneurial skills, supply of entrepreneurship education for practitioners, as well as research to advance knowledge in social entrepreneurship. Our analysis of social entrepreneurship education provided via online courses shows that out of the ten well-known MOOC platforms included in the research, only five of them offer specialized courses, programmes and degrees in social entrepreneurship, with the largest diversity of courses delivered via two platforms, namely Coursera (n=115), followed by Udemy (n=46).

Table 1. MOOC platforms and their offer of social entrepreneurship courses

Platform	Webpage	No. of courses/programs in social entrepreneurship
Canvas Network	https://www.canvas.net/	0
Cognitive Class	https://cognitiveclass.ai/	0
Coursera	https://www.coursera.org/	115
edX	https://www.edx.org/	15
FutureLearn	https://www.futurelearn.com/	10
iversity	https://iversity.org/	2
Kadenze	https://www.kadenze.com/	0
Khan Academy	https://www.khanacademy.org/	0
Udacity	https://www.udacity.com/	0
Udemy	https://www.udemy.com/	46

Source: Authors' research

The topics covered through these courses and programmes (Table 2) include almost everything a student would like to learn to become a social entrepreneur that helps him with understanding the social enterprise opportunities, developing the business model that addresses the challenge identified, running and growing the social enterprise, and assessing the social impact.

Table 2. Social entrepreneurship courses offered via the MOOC platforms

Platform	Main topics of the course
Coursera	Social entrepreneurship opportunities, social business model, social enterprise impact, business strategies for social impact, crowd founding, creative collaboration, sustainable business enterprises, subsistence marketplaces, sustainable innovation, local economic development, etc.
edX	Enabling entrepreneurs to shape a better world, entrepreneurship in emerging economies, employment for a sustainable future, business and impact planning for social enterprises, feeding a hungry planet, sustainable urban development, scaling the business, etc.
FutureLearn	Social innovation, global solutions for a sustainable future, entrepreneurship in non-profits, entrepreneurial potential, impact investing, becoming an entrepreneur.
iversity	Social innovation, change-maker – social entrepreneurship.
Udemy	Starting a business with no money, building a social enterprise, starting a successful home business, sustainable entrepreneur training, becoming a social entrepreneur, starting a NGO, grassroots community organizing fundamentals, goal setting in life, etc.

Source: Authors' research

In recent years, more and more universities have diversified their educational offer by adding various MOOC programs to their traditional courses. As previously mentioned, these online courses aim at unlimited participation, being an affordable alternative to formal education. Practically, any learner can access the online course from their location, in a flexible mode of learning and regardless of prior experience or entry requirements. To get a deep understanding of the content and structure of the social entrepreneurship education in universities offered via MOOCs, we further researched the programs in social entrepreneurship offered by Coursera. This online platform was chosen for further analysis as it is one of the largest MOOC provider

in the world and since it offers the largest variety of courses in social entrepreneurship (n=115) out of the ten online platforms analysed. The sampling technique applied to select universities that will be investigated is purposive sampling. The universities included in the purposeful sample had to meet certain research criteria: they belong to different regions of the globe, offer at least three courses or programmes in social entrepreneurship and involve more than two partners in delivering the course. The analysis of the thematic areas covered through the social entrepreneurship MOOCs in our sample of universities reveals some useful findings (Table 3). There are universities from various continents --North America, Europe, Asia, and Africa-- joining the platform, about 50% of them offering more than two courses in social entrepreneurship. The analysis of the frequency with which some key words appear in the name or outline of the course reveals the following communalities: a commitment toward building sustainable innovation and sustainable social enterprise, interest in understanding, building and measuring social impact, and a drive for generating change for a better world and greater good. There are also some differentiations in what regards education for social entrepreneurship via online courses, as follows: creation and development of a technological start-up, use of technology like 3D printing software and hardware or digital advertising, and social enterprise business modelling for certain markets (e.g., care for elders, landscape restoration, subsistence markets).

Table 3. Thematic areas of the SE MOOCs offered via Coursera

University	No. of courses	Thematic areas
University of Pennsylvania	11	Business strategies for a better world, social entrepreneurship, social impact strategy: tools for entrepreneurs and innovators, business strategies for social impact, corruption, entrepreneurship, English for business and entrepreneurship, growth strategies, building high-performing teams, global trends for business and society, crowdfunding.
University of Illinois at Urbana-Champaign	9	Innovation: from creativity to entrepreneurship, global challenges in business, 3D printing software and hardware, the 3D printing revolution, creative collaboration, sustainable innovation for subsistence marketplaces, sustainable business enterprises, subsistence marketplaces.
ESSEC Business School	8	Social entrepreneurship: its business plan, evaluation and measurement of social impact, financing a project with social impact, impact investment – fundamentals, financing which change the world, innovation.
Copenhagen Business School	6	Social entrepreneurship, identifying social entrepreneurship opportunities, social business model and planning for social innovation, unleashing the impact of social enterprise, sustainability and CSR in Scandinavia, business models for innovative care for elders
University of Colorado Boulder	6	Social media advertising, digital advertising strategy, introduction to digital advertising landscape, developing a systems mindset, be your best creative self, giving helpful feedback.
HEC Paris	5	Change entrepreneur, innovation management and entrepreneurship, innovation and entrepreneurship, creation and development of a technological start-up, managing innovation and design thinking.
Erasmus University Rotterdam	4	Driving business towards the sustainable development goals, local economic development, a business approach to sustainable landscape restoration, business model innovation for sustainable landscape restoration.

University	No. of courses	Thematic areas
University of Colorado System	4	Becoming a sustainable business change agent, sustainable business: big issues, big changes, first steps to make the business case for sustainability, researcher management and leadership training.
University of Virginia	4	Design thinking for the greater good: innovation in the social sector, new models of business in society, business growth strategy, grow to greatness: smart growth for private businesses.
London Business School	3	How to finance and growth a start-up without VC, aligning business, brand a behaviour, managing the company of the future.
University of Cape Town	3	Becoming a change maker: introduction to social innovation, Fintech start-ups in emerging markets.

Source: Authors' research

To understand what predicts a social entrepreneurial behaviour of the universities that provide social entrepreneurship MOOCs, we scrutinized the vision and mission statement documents of those universities included in the study. The main sections under analysis concern the mission and vision stated and the values shared. The key messages of the mission or vision statements are summarized in Table 4.

Table 4. Analysis of the selected universities' mission or vision

University	Webpage	Key message of the mission statement
University of Pennsylvania	https://www.upenn.edu/	"The most inclusive, innovative, and impactful university in the nation"
University of Illinois at Urbana-Cham	https://illinois.edu/	"Enhance the lives of citizens in Illinois, across the nation and around the world through […] engagement and economic development."
ESSEC Business School	https://www.essec.edu/	"Train and develop bold pioneers and influential leaders for both the business world and society."
Copenhagen Business School	https://www.cbs.dk/	"A laboratory for the development and 'testing' of novel 'hybrid' agencies"; "engage with and solve the so-called 'wicked problems'."
University of Colorado Boulder	https://www.colorado.edu/	"Be the top university for innovation"; "positively impact humanity."
HEC Paris	https://www.hec.edu/	"Engage in role and impact of organizations and markets."
Erasmus University Rotterdam	https://www.eur.nl/	"Create a positive impact on societal challenges"; "a balance between people, planet and profit."
University of Colorado System	https://www.cu.edu/	"A premier, accessible and transformative public university."
University of Virginia	https://www.virginia.edu/	"Creation and sharing of knowledge within a culture that promotes equity, diversity, and inclusiveness."
London Business School	https://www.london.edu/	"Challenge conventional wisdom, transform careers and empower people to change the way the world does business."
University of Cape Town	https://www.uct.ac.za/	"An inclusive and engaged university"; "advancing a more equitable and sustainable social order."

Source: Authors' research

As Table 4 shows, all of the universities investigated have clearly stated social missions or are driven by the objective of creating socially responsible students and academics who are quite close to becoming social entrepreneurs. However, they need to be supported by the whole university ecosystem, community itself, powerful companies and government alike (Etzkowitz, 2003; Litzky et al., 2010). Based on the descriptions provided by mission or vision statements, we conclude that these are key determinants that are more capable of fostering direct social action and innovation. As Păunescu and Cantaragiu (2013) state, organizational activities aiming at social responsibility are a good source of knowledge and inspiration for the social entrepreneur who is constantly seeking new opportunities. These new opportunities lead to innovative business ideas and new social entrepreneurial drive. As a result, social entrepreneurial organization is born and develops by recognizing and exploiting opportunities created in socially responsible organizations.

6. Conclusions

The present paper contributes to the study of social entrepreneurship in higher education by awaking academic curiosity for the thematic areas and content of the social entrepreneurship education provided via Massive Open Online Courses in universities. The research results show that commitment toward building sustainable innovation and sustainable social enterprise, interest in understanding, building and measuring social impact, and drive for generating change for a better world and greater good are among the main characteristics of social entrepreneurship MOOCs. There are also some aspects of the social entrepreneurship education offered via online courses that make a difference for learners when choosing a course: development of a technological start-up, impact of 3D printing revolution, and social enterprise business modelling for certain markets. Additionally, in the paper we discussed about the social vision and mission of the university as key determining factors that explain the social entrepreneurial behaviour of the universities providing social entrepreneurship MOOCs.

The importance of this study derives from the contribution of social entrepreneurship education to the society well-being. The literature in this field is very complex, as social entrepreneurship is becoming an extensively used term, but it has so many ramifications that every analysis made in this field has an important role in clarifying social entrepreneurship's dimensions. Also, extending the areas of research outside the commonly addressed business sector to the higher education sector brings with it challenges to old beliefs and the rewards of new beginnings in both practices and theories.

Universities investigated in our research are doing great efforts to develop a social entrepreneurial behaviour and entrepreneurial skills among their students, by offering them a broad variety of social entrepreneurship online courses and programmes, combining theory with practice. However, our research is limited to only the social entrepreneurship education offer of universities that are present on Coursera online learning platform. Also, the current research findings rely upon the accuracy and completeness of data available on the universities` websites, which

means that some observations made in the paper may not reflect entirely the reality of situation exposed and cannot be generalized. Future research should extend the analysis to social entrepreneurship online courses available through all the MOOC platforms. Our findings also need to be further tested empirically in future research through quantitative analysis.

Taking into consideration the results of our research, it became natural for universities to wish to change the higher education system to encourage students to think and behave more entrepreneurially, at the same time equipping them with the skills to start their own ventures (Kirby & Ibrahim 2011). To promote a more socially aware, sustainable economy, organizations need to work closely with the country's universities to change the curriculum and the way students are taught. Therefore, social entrepreneurship in higher education will work well by defining a clear social vision and mission and establishing catalytic social actions that drive the social value creation, society change and sustainability (Păunescu & Cantaragiu, 2013).

References

[1] Alvord, S. H., Brown, L. D., & Letts, C. W. (2004). Social entrepreneurship and societal transformation, *Journal of Applied Behavioral Science*, 40(3), pp. 260-282.

[2] Bratianu, C., Prelipcean, G., & Bejinaru, R. (2020). Exploring the latent variables which support SMEs to become learning organizations, *Management & Marketing. Challenges for the Knowledge Society*, 15(2), pp. 154-171.

[3] British Council (2017). *Social entrepreneurship in education. Empowering the next generation to address society's needs*. Retrieved from: https://www.britishcouncil.org/sites/default/files/british_council_social_entrepreneurship_in_education_web_final.pdf.

[4] Cantaragiu, R., Păunescu, C., & Hadad, S. (2014). The social impact of university entrepreneurship in Romania: Is the institutional discourse replicated or adapted?. *Management & Marketing. Challenges for the Knowledge Society*, 9(4), pp. 403-422.

[5] Choi, N., & Mahumdar, S. (2014). Social entrepreneurship as an essentially contested concept: Opening a new avenue for systematic future research, *Journal of Business Venturing*, 29(3), pp. 363-376.

[6] Dargaud, E., & Jouneau-Sion, F. (2020). The good MOOC and the Universities. Education Economics, June, doi/full/10.1080/09645292.2020.1775182.

[7] Etzkowitz, H. (2003). Innovation in innovation: The triple helix of university-industry-government relations, *Social Science Information*, 42, pp. 293-337.

[8] Hadad, S. (2017). Strategies for developing knowledge economy in Romania, *Management & Marketing, Challenges for the Knowledge Society*, 12(3), pp. 416-430.

[9] Hockerts, K. (2018). The effect of experiential social entrepreneurship education on intention formation in students, *Journal of Entrepreneurship*, 9(3), pp. 234-256.

[10] Kanter, R. M. (2010). It's time to take full responsibility, *Harvard Business Review*, Oct, p. 42.

[11] Kedmenec, I., Rebernik, M., & Tominc, P. (2016). Social entrepreneurship education and its association with perceived desirability and feasibility of social entrepreneurship

among business students, *Croatian Journal of Education - Hrvatski Casopis za Odgoj i Obrazovanje*, 18(4), pp. 1035-1053.

[12] Kirby, D. A., & Ibrahim, N. (2011). The case for **(**social**)** entrepreneurship education in Egyptian universities, *Education and Training*, 53(5), pp. 403-415.

[13] Leadbeater, C. (1997). *The rise of the social entrepreneur.* London: Demos.

[14] Litzky, B. E., Godshalk, V. M., & Walton-Bongers, C. (2010). Social entrepreneurship and community leadership: A service-learning model for management education, *Journal of Management Education*, 34(1), pp. 142-162.

[15] Păunescu, C., & Cantaragiu, R. (2013). *The social role of university entrepreneurship*. In: P. Ordonez de Pablos & R. Tennyson (Eds.) Strategic role of tertiary education and technologies for sustainable competitive advantage, pp. 103-120, Hershey: IGI Global.

[16] Păunescu, C., Drăgan, D., Cantaragiu, R., Filculescu, A. (2013). Towards a Conceptualization of Social Entrepreneurship in Higher Education, *The International Journal of Management Science and Information Technology (IJMSIT)*, ISSN 1923-0273, NAISIT Publishers, Toronto, Iss. 10, Dec., pp. 51-69

[17] Tierney, T. J. (2011). Collaborating for the common good. *Harvard Business Review*, July-August 2011, p. 38.

[18] Thompson, J. L., Alvy, G., & Lees, A. (2000). Social entrepreneurship: A new look at the people and the potential, *Management Decision*, 38, pp. 328-338.

[19] Vardi, M. Y. (2012). Will MOOCs destroy academia?, *Communications of the ACM*, 55(11), p. 5.

[20] Watters, A. (2012). Unbundling and unmooring: Technology and the higher ed tsunami, *Educause Review*, 47(4), pp. 60-61.

[21] Weerawardena, J., & Mort, G. S. (2006). Investigating social entrepreneurship: A multidimensional model, *Journal of World Business*, 41, pp. 21-35.

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Role of the University in Sustaining the Relevance of Knowledge amid the Future Shock

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Abstract

Inequality gap expressed as lack of access to basic rights, like health, education, water, energy, food, and decent work is a major challenge at institutional and individual level worldwide. Global health crisis initiated by the COVID-19 opened an additional feature of this inequality gap, caused by the lack of technology support for education not only in developing countries, but as well as in the most advanced countries. Using United Nations Sustainable Development Goals 2030 as the only available consensus for partnerships in closing the inequality gap as a starting point, the aim of this paper is to contribute to the recent discussion on the role of the University in this process. Three research questions are identified: how does the university cope with the future shock; what is the role of the university in closing the poverty gap; and how does the university collaborate in Triple / Quadruple / Quintuple Helix with other actors. Implemented desk research of the recent academic and non-academic discussion on the capabilities and capacities of the university to make changes using 'creative destruction' principle, to build and disseminate relevant knowledge and to collaborate with different actors in the society provided a needed platform which was used to position Croatian universities against such questions.

Keywords: university, relevant knowledge, sustainable development goals, Triple Helix, inequality.

JEL Classification: I24; I23

1. Introduction

Wars, hunger, poverty, lack of access to health and education for many migrants, discrimination on gender, colour, age, sexual orientation, religion, or political views are around us for years. Those causes of inequalities do not disappear in one's lifetime, they are connecting generations and they are part of their memories. The longevity of inequalities across the history opens the question: what the humanity is doing wrong, to allow to be caught by an 'inequality trap' again and again. In looking for answers, everything should be questioned. The list is long, but not final: the

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definition of the problem (inequality), goals to be achieved in a generational time span (with shorter time slots in order to measure the progress and have the time for intervene based on the feedbacks), pool of trajectories available for solving the problems, actors involved in these processes, relationships among actors, consistency and timing of each actor's interventions, indicators and measurement approaches.

The global health crisis triggered by the COVID-19 is putting additional challenge to everyone to contribute to answering to those questions, because the whole world is in transition to the Future Shock mode, without having a choice between cultural and future shock.

The University has been for centuries a place of concentration of knowledgeable people who develop knowledge (research) and spread knowledge (education). Such social position of the University requests the highest institutional responsibility in dealing with any of key issues of humanity and the planet. This piece of thought is focused on the educational role of the university in dealing with inequalities on the edge / amid of the Future Shock.

2. Problem Statement

The only available conceptual approach of connecting dots in dealing with inequalities in different aspects of the life of any individual is offered and agreed upon on global level by the United Nations Sustainable Development Goals 2030. Such consistent discussion on activities needed to erase huge differences in the quality of life (with visioning goals, measurable goals, monitoring) is available only from 2000[2].

The structure of UN SDGs 2030 is very much in line with contemporary academic discussion on inequality, by emphasising the need to fight poverty as a cause of inequality in order to avoid to be caught by the 'inequality trap' (Watson, 2015). Inequality trap results from the focus on the top end of the income distribution, rather than on those at the bottom who need help most.

Poverty comes in different forms, as lack of access to food, clean water and energy, lack of access to health services, to education, and information, lack of access to decent work. Despite all those forms of poverty are interconnected, here the focus will be on educational equality, university role and entrepreneurial competence. As Piketty (2020:546) states, 'educational equality played a more important role in economic development than the sacralisation of inequality, property, and stability' analysing what was happening in Western Europe and the United States in last 200 years. Lowering investments in education slowed down productivity growth, and opposite holds as well.

Being more specific, lack of access to digital technology in education was known as a poverty issue in many countries for decades, but the COVID-19 spotlighted it as an unprecedented generational danger even in high income countries. Even before COVID-19 there were very grim scenarios related to education. In 2016, UNESCO

[2] Based on the Millenium Declaration, adopted by the UN General Assembly on 18 September 2000.

estimated that the achievement of the projected 2030 Sustainable Development Goals in the education will be significantly delayed: universal upper secondary education only in 2084 (in 2100 in low income countries and 2048 in high income countries) (UNESCO Global Education Monitoring Report, 2016:153).

Those scenarios developed at national level, confirm that both education and time matter for economic development, and how the process of closing this inequality gap is slow. On tertiary level there are also huge differences among countries depending on development status: in 2010, 30% of people in South Korea completed tertiary education[3], followed by Ireland (26.8%) and the US (26.76%). At the same time, in many of the world's poorest countries less than 1% have completed tertiary education (Roser and Ortiz-Ospina, 2013).

Besides those inequalities in accessing education that are known for years, COVID-19 spotlighted the issue of poverty (lack of access to quality education) on subnational levels, even in the most developed countries. This poverty issue was partially hidden by the mode of delivering educational curricula, in schools. Young people came to a classroom, equalized to some extent at least for few hours each school day – now with online teaching / learning because of inequality in access, this temporary equality faded out.

The asymmetry between the needs to achieve Sustainable Development Goals and available energy to do it (knowledge, commitment, capacity for partnership, to network and collaborate) open a very simple question about the ethical dimension of not doing enough. It is a question of the moral society as phrased in *I* & *WE* paradigm (Etzioni, 1968; Etzioni, 1988). Or, to put it differently - how anyone can explain to migrants that they have to stay in their homelands (low income countries) if their children are 50 years late comparing to the children in high income countries with equalized access to upper secondary education.

Those thoughts frame the problem of building the capacity at individual and institutional level across the world in order to close this asymmetry. Otherwise, the persistency of such asymmetry is increasing the entropy in the society, which can lead only to more poverty accompanied by social and political destructions. If the university claims to be a place of the highest concentration of knowledge, then the university has the highest responsibility in collaborating or even leading the process of closing the asymmetry between needs and energy needed in solving them.

3. Research Questions/Aims of the research

The described research problem of how to close poverty gap opens several research questions:

- how does the university cope with the future shock?
- what is the role of the university in closing the poverty gap?
- how does the university collaborate in Triple / Quadruple / Quintuple Helix model with other actors?

[3] Percentage of population age 15+ with completed tertiary schooling.

The purpose of answering those research questions is to contribute to the reason why universities should re-imagine themselves before being washed away by the Future Shock.

4. Research Methods

The described research problem and the aims of the research are approached by using desk research and analysis of publicly available information from universities in Croatia.

Relevant information from academic literature and studies focused on the future of jobs were collected through the desk research. In the academic literature the surveyed topics were: entrepreneurial / innovative universities, educational eco-system, entrepreneurial competences as an outcome of teaching/learning on the tertiary level, educational role of the university, Triple / Quadruple / Quintuple Helix concept of collaboration among different actors in social, economic and political life.

In searching studies/reports focused on the future of jobs[4], the criteria was the publishing period 2010-2020, with a forecasting view to 2030 or further.

Getting insights on how universities are responding to UN Sustainable Development Goals and the future of jobs, the analysis of strategic documents of all ten Croatian universities, publicly available on their websites, were analysed in September 2020.

5. Findings

The survey carried out in terms of academic and non-academic literature provides a platform used to get preliminary insights on gaps regarding the knowledge of how to contribute to making life better for everyone, as expressed by the UN Sustainable Development Goals. Based on the confirmed fact of the importance of education for economic development, and of the university as a major institution for educating educators and other professionals, the findings will be presented from the university perspective.

5.1. University and the Future Shock (capability for change or constructive destruction)

There is no more dilemma about cultural vs. future shock as Toffler (1970) warned the world – future shock is with us, now. Global health crisis caused by the COVID-19 only emphasized Toffler's major message – that in the future shock mode there is no way to go back to someone's comfort zone, because it disappeared. "New normal" syntagm sends such message as well.

And, that's exactly what happened to the university as well. Early warning signals were around for some time, especially in last twenty years. The most important early

[4] This search was done in 2020 by Sara Cats, student at the Erasmus University, Rotterdam, International Bachelor Communication and Media program.

signals are connected to jobs, skills, places to learn and attitudes toward educational certificates. Data on disappearing jobs started to arrive, accompanied by sighting new jobs (Autor, D.H., Levy, F. and Murnane, R.J., 2003; Manyika, J. et al., 2017). Many consulting firms / career advisors took a lead in looking in the future of jobs – e.g. McKinsey, Crimson, Resumeble, Nitro. Those studies usually are using a time horizon up to 2030, some of them up to 2025-2050[5]. Manyika et al. (2017) foresight that the most jobs will be lost in the group of predictable physical activities and collecting & processing the data, which will be automated. The biggest number of new jobs will be created in applying expertise, followed by interacting with stakeholders and managing people. Crimson Education suggests future students to pay attention to skills that will be essential in the coming period 2025-2050: Mental Elasticity and Complex Problem Solving; Critical Thinking; Creativity; People Skills; STEM; SMAC (social, mobile, analytics and cloud) and Interdisciplinary Knowledge. Such changes in the structure of jobs will be reflected in rising the need for higher level of education (tertiary) everywhere - in advanced and developing economies.

Digitalization and institutional diversification open a door for new places of learning outside of existing educational formal institutional structure (universities, schools). At the same time, according to the Pearson's Global Learner Survey (2020) 67% of surveyed persons think that education institutions are less effective in using technology than other industries (such as healthcare or banking).

Certificates of educational accomplishment from the traditional educational institutions are not any more the only strengths for getting a job. McKinsey survey (2017)[6] revealed that 82 percent of executives think that the potential skills gap emerging from automation/digitalization will be closed through retraining and reskilling in companies. Pearson Global Learner Survey (2020) reported a change in students' attitudes to obtaining a traditional four-year degree – 40 percent think 'you can do okey in life today without a university degree' vs. 32 percent who think 'a university or post-secondary degree is essential to achieving a successful and prosperous career'.

Those signals of a growing gap between skills needed and skills provided by the formal education, the emergence of new educational providers and the changed attitudes in relation to traditional certificates are around for decades, but not accompanied with the stream of radical changes in the university education.

At the same time, there is a stream of messages about the need to change educational institutions coming from researchers and educators for decades, even centuries, almost with the same content. Recently this flow of messages is getting on the strengths. Senge (2012) and his *fifth discipline* team forged the term *Schools That*

[5] For example, Resumeble, a carreer advising firm, identify highly demanded jobs in 2025-2050: space pilot, data detective, ethical source manager, extinct species revivalist, companion for the aged, IT service broker, AI specialist, User experience designer, 3D printing engineer, digital rehabilitation counselor. https://www.resumeble.com/career-advice/jobs-of-the-future-2025-2050, retrieved on Sept. 10, 2020.

[6] McKinsey panel survey, November 2017 (n=1549 executives of private sector companies with > USD 100 annual revenue.

Learn based on a stock of good examples of transforming school institutions into learning organizations, by using their 'own unique combination of theories, tools, and methods for learning'.

Gibb (2003) argues that without creative destruction in the field of higher education fundamental progress will not be made: 'there is a need to apply the Schumpeterian notion (1934) of creative destruction to the higher education sector itself, in order to find innovation (new ways of doing things) and new combinations of knowledge'.[7]

Field research test:

In analyzing strategic documents of Croatian universities, announcements of new curricula, usually related to environmental dimension in the fields of energy, agriculture, construction can be found, but nothing about closing some curricula or about radical changes in the content or delivery form.

5.2. University and closing the poverty gap (capability of producing and offering relevant knowledge)

Research academic and non-academic literature (studies) on future of jobs indicate that the university is maybe already a part of a problem, not of a solution. A study published by the Foundation for Young Australians (2017) found that nearly 60 percent of Australian students (70% in vocational education) are currently studying or training for occupations where at least two thirds of jobs will either look very different or completely lost in the next 10 to 15 years due to automation.

Again, the Future Shock is already around us – but the university is not responding. Students who are best prepared for the future are the most important change agents (OECD, 2018:4) and therefore the questions asked by the OECD (2018:2) are very appropriate and alarming:

- What knowledge, skills, attitudes and values will today's students need in order to thrive and shape their world?
- How can instructional systems develop these knowledge, skills, attitudes and values effectively?

Those questions are challenging a capability of the university to build and spread the relevant knowledge the relevancy of which is checked from two perspectives: through skills mismatch (supply/demand ratio) and through the progress of achieving UN sustainable development goals. Relevant knowledge assumes a departure from disciplinary structured curricula toward the cross-disciplinary design of educational process (Singer, 2020), which upgrade the relevancy of knowledge in dealing with defining and solving problems. Relevant knowledge emerges from dynamic

[7] Gibb (2003) emphasised how such discussion have a long history – e.g. two philosophers warned universities to change the attitudes toward its educational function: John Henry Newman said in 1852 how universities should stop with pushing students into 'acquisition of sterile facts'; or Alfred North Whitehead said in 1928 'that the proper function of the university is the imaginative acquisition of knowledge'.

processes of connecting pieces of knowledge from disciplinary channels depending on the needs of decision-making processes.

The case of including teaching / learning entrepreneurial competences in the university is an excellent example of why the move from mono disciplinary curricula toward cross-disciplinary, integrated, relevant knowledge (entrepreneurial competence) is not easy. Many questions are still emerging – where it should be placed, who should teach it, which pedagogies are the most suitable for getting expected outcomes (entrepreneurial competence, the broadest definition).

A possible cause of difficulty in implementing such integrated, cross-disciplinary definition which is the basis for building relevant knowledge, Gibb (2007:67) the fact that the 'contract' between the university and the student is 'not formally focused upon personal development but on the acquisition and testing of knowledge' which leads to the certification.

Field research test:

While analyzing strategic documents from Croatian universities, we discovered nothing about developing institutional capability to produce and disseminate relevant knowledge. There is no intention to depart from mono-disciplinary curricula structure and adopt an integrated, cross-disciplinary approach.

5.3. University in Triple / Quadruple Helix / Quintuple model (capacity for collaboration)

Asymmetry between problems and capacity to deal with them can be found everywhere, in institutional or individual context, on different levels. The university as a place where knowledge has been produced (research) and spread around (formal education), has a very prominent role in developing the capacity of individuals and institutions to deal with problems, but it cannot be done without collaboration with other actors.

The university mostly collaborates with others in performing its research function, much less in educational activities and only recently more in serving the community. Research function is organized around three modes: Mode 1 in which own research agenda is focused on inventions; Mode 2 where the research agenda is impacted by the needs to solve specific problems (applicative research) and Mode 3 in which research activities are dominantly triggered by the problems of the community ("GloCal" - local meaning but global reach).

Changing modes of collaboration are challenging the university to be more engaged with different actors. Triple Helix model (Etzkowitz and Leydensdorf, 1995; Etzkowitz, 2008) identifies collaboration among the academia, business sector and government. Carayannis and Campbell (2012) broadened this model with the civil society and designed the Quadruple Helix with even more collaborative expectations. In the Quintuple Helix model, environmental considerations additionally put pressure on collaborations.

The university's organizational culture, cultivated for centuries on the concept of autonomy is not contributing to the collaborative capacity of the university, without

adding a concept of accountability. Collaboration requires trust and mutual understanding, which is difficult to ensure because actors in the Quintuple Helix model speak different 'languages' in terms of interests / indicators. Achieving joint goals (UN SDGs) depends on the capacity for collaboration which can be measured only through the effectiveness of relationships among actors in the Quintuple Helix model.

The concepts based on the Triple Helix model are accompanied by the discussion on an engaged university (Watson et al., 2011). There is an evident increase of the universities changing their mission statements by emphasizing its engaged roles and joining networks like the Association of University Leaders for a Sustainable Future (ULSF), based on the Talloires Declaration from 1990, which had been signed by over 500 college and university presidents and chancellors worldwide. ULSF promotes sustainability as a critical focus of teaching, research, operations and outreach in higher education through publications, research, and assessment.

Field research test:

While analyzing strategic documents of Croatian public universities (except in the case of the University of Rijeka) we found nothing related to strengthening the collaborative capacity in the context of Triple / Quadruple / Quintuple Helix models, or emphasizing their engaged (social) role.

6. Conclusions

Findings related to all three research questions are complementing each other. The University is already in the Future Shock – pandemic COVID-19 only underlined this 'new normal' from which there is no return. Literature review indicated many signals that are still not read or understood by the university. Many presented surveys revealed new expectations of the young people and business sector, but the university's business model stayed mainly unchanged. It confirms very low capability of the university to change its vision, mission, organisational structure and culture. The concept of autonomy is still dominant, the accountability is not operationalised, which is seen in the rankings industry. Hazelkorn (in Marope, Wells and Hezelkorn, 2013) emphasises what rankings do not measure:

- Teaching and learning, including 'added value', the impact of research on teaching
- Technology/knowledge transfer or impact and benefit of research
- Regional or civic engagement
- Student experience

The 'multilingual' feature of the Quintuple Helix model is preventing better collaboration among its actors. It could be overcome, if there was a meta language which enables understanding among actors. Lack of indicators measuring the synergetic effects of collaboration kills system's characteristic of the Quintuple Helix – therefore the answer could lie in developing a set of indicators that will

go beyond measuring outputs of individual actors, but focus on the results of interconnectedness.

From the field research, by analyzing strategic documents of Croatian universities, it is not visible if questions like *What does this trend mean for the future of my education system? And what can I do?* are used for thinking about the future. Those documents do not provide a visionary invitation for creative destruction in order to make the university a partner in closing the inequality gap. It would be informationally valuable to check why the process of adding the accountability concept to the autonomy is so slow, by applying case method approach while analyzing two Croatian universities (being different in the size, years of functioning, educational focus).

Moral responsibility of the university expressed as its contribution to the better life for everyone requires radical changes: (a) to change the contract between the student and the university – personal development is a key; (b) to change criteria for promotion of educators – contribution to personal development of students and serving to the needs of the community should be major criteria; (c) to change criteria for institutional rankings – to include contribution of educators to personal development of students and to solve issues of the immediate community to which the university belongs.

Acknowledgment

The research problem and the discussion around research questions are very much designed in the framework of Allan Gibb's thinking about university's role in entrepreneurial learning and in developing own entrepreneurship eco-system. Allan Gibb helped our team at the UNESCO Chair in Entrepreneurship Education at the J. J. Strossmayer University in Osijek, Croatia in developing educational programs (from bachelor to doctoral level on entrepreneurship) and the eco-system (Center for entrepreneurship in Osijek http://www.czposijek.hr/About-us/; CEPOR – SMEs and Entrepreneurship Policy Center http://www.cepor.hr/en/). This paper is a tribute to late Allan Gibb for his intellectual footprints in Croatia.

References

[1] Autor, D. H., Levy, F. and Murnane, R. J. (2003). The skill content of recent technological change: An empirical exploration, *The Quarterly Journal of Economics*, 18(4).

[2] Carayannis, E. G., Barth, T. D., Campbell, D. F. J. (2012). The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, 1(1).

[3] Etzioni, A. (1968). *The Active Society*. New York: McGraw-Hill.

[4] Etzioni, A. (1988). *The Moral Dimension: Toward A New Economics.* New York: The Free Press.

[5] Etzkowitz, H., and Leydesdorff, L. (1995). *The Triple Helix - University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development*. Rochester, NY. SSRN 2480085.

[6] Etzkowitz, H. (2008). *The triple helix: university-industry-government innovation in action*. New York: Routledge.

[7] The Foundation for Young Australians. (2017). The new work order: Ensuring young Australians have skills and experience for the jobs of the future, not the past.

[8] Gibb, A. (2003). In Pursuit of a New 'Enterprise' and 'Entrepreneurship' Paradigm for Learning: Creative Destruction, New Values, New Ways of Doing Things and New Combinations of Knowledge. *International Journal of Management Reviews*, 4(3).

[9] Gibb, A. (2007). *Creating the entrepreneurial university: do we need a wholly different model of entrepreneurship?* in Fayolle, A. (ed.) Handbook of Research in Entrepreneurship Education, Volume 1: A General Perspective. Cheltenham, UK: Edward Elgar.

[10] Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., Ko, R., and Sanghvi, S. (2017). *Jobs lost, jobs gained: Workforce transitions in time of automation, Executive Summary.* McKinsey Global Institute.

[11] Marope, P. T. M., Wells, P. J. and Hazelkorn E. (editors). (2013). *Rankings and Accountability in Higher Education: Uses and Misuses*. Paris: UNESCO.

[12] Pearson (2020). *The Global Learner Survey*. London.

[13] go.pearson.com/global-learner-survey (2020). retrieved Sept. 10.

[14] Piketty, T. (2020). *Capital and Ideology*. Cambridge MA, London Engand: The Belknap Press of Harvard University Press.

[15] Roser, M., and Ortiz-Ospina, E. (2013). *Tertiary Education. Published online at OurWorldInData.org.* Retrieved from: 'https://ourworldindata.org/tertiary-education' Online Resource.

[16] Senge, P. M. et al. (2012). *Schools that learn: a fifth discipline field book for educators, parents, and everyone who cares about education*. London: Nicholas Brealey.

[17] Singer, S. (2020). *Polymathy as the missing link to increase access to relevant knowledge*, in Humanistic futures of learning: perspectives from UNESCO Chair and UNITWIN Network, Paris, pp. 196-199. UNESCO, Paris.

[18] Toffler, A. (1970). *Future Shock*. Random House.

[19] UNESCO Global Education Monitoring Report (2016). Education for People and Planet: Creating sustainable futures for all. Paris: UNESCO.

[20] Watson, D., Hollister, R., Stroud, S. and Babcock, E. (2011). *The Engaged University: International Perspectives on Civic Engagement*. New York: Routledge.

[21] Watson, W. (2015). *The Inequality Trap: Fighting Capitalism Instead of Poverty*. Toronto; Buffalo; London: University of Toronto Press.

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EU and UNESCO Educational Initiatives Integration for Environmental Education on Sustainable Water Resources Management

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Abstract

United Nations' Sustainable Development Goals set the policy priorities for confronting the economic, social and environmental risks that our planet is facing, with equitable education and clean water and sanitation to be designated among these goals. As the main United Nations organization focusing on education, science and culture, UNESCO fully supports the implementation of the goals that lie within its respective fields of competence, such as education and natural sciences, as well as triggers frameworks and programmes such as the Education and Sustainable Development 2030 and the UNESCO's UNITWIN and Chairs towards this direction. In European Union, the well-established education programmes, i.e. the ERASMUS+ programme, play an important role on the enhancement of education systems with the perspective of sustainable development not only at the Union's level but at the global one. The specific work presents the potentiality of integrating frameworks that are supported by different international organizations and programmes for achieving the enhancement of higher education with regard to sustainable environmental management. We demonstrated the water resources management problems in three heteroclites geographical areas of the word and the way that integrated actions of higher education institutions with the UNESCO Chair INWEB, under the umbrella of ERASMUS+ programmes, deal with the specific objectives. A key issue for the successful implementation of the programmes was the willingness of the partners to reform their educational structures and adopt innovative solutions that promote water resources sustainability.

Keywords: Higher education, water resources management, sustainable development, UNESCO Chair INWEB.

JEL Classification: I23, Q25

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1. Introduction

The Sustainable Development Goals (SDGs) along with their thematic targets are considered as the state-of-the-art directions framework for the sustainable development of our planet. SDGs address the global challenges that the world is facing, including those related to poverty, peace and justice, education, climate change and environmental degradation (UN, 2015). SDG 4 is dedicated to equitable quality education and promotes lifelong learning opportunities for all, with education considered as a ladder for socioeconomic mobility for escaping from poverty. According to Le Blanc (2015), the proposed goals and targets are interconnected in a form of a network since links among goals exist through targets that refer to multiple goals. Although, for example, SDG 6 is related to clean water and sanitation, improved access to water, sanitation and hygiene facilities in schools can improve health, attendance and welfare of students and teachers, and thus contribute to improved educational outcomes (UN, 2018), i.e. contributing to SDG 4.

At the same time in 2019, as the lead United Nations (UN) Educational Scientific and Cultural Organization, UNESCO initiated the Education for Sustainable Development: Towards achieving the SDGs (ESD for 2030) framework (UNESCO, 2019). The specific framework stressed the crucial role of ESD as a "*key enabler for all SDGs and a key element of quality inclusive education to build a more just and sustainable world*". As a follow up to previous actions, ESD for 2030 maintains the five priority action areas, such as policy, whole-institution approaches, teachers, youth and community level, for ensuring coherence and complementarity with other education approaches.

Currently, in the European Union (EU) education, training, research, youth and sports are supported by the EU Erasmus+ Programme. Education and training can make a major contribution to deal with socio-economic changes, i.e. the key challenges that will appear the next few years (EU, 2013). The current programme, which will be completed in 2020, has specific objectives such as of improving learning mobility of individuals in the EU and overseas, development of joint master's degree programs across institutions, large-scale European voluntary service events, cooperation for innovation, and the exchange of good practices (Cacchione, 2015). The programme acknowledges that well-performing education and training systems provide people with the skills required by the labour market and the economy. One advantage of ERAMSUS+ is that the eligibility for cross-border education, training and research is not exclusively dedicated to the EU citizens, but various non-EU Higher Education Institutions (HEIs) could be beneficiaries.

Through its UNITWIN programme, UNESCO fosters international cooperation and networking among universities around the globe by supporting the development of UNESCO Chairs and UNITWIN cooperation programmes (UNESCO, 2017). The Chairs initiative, which was launched in 1992, focuses on the reinforcement of HEIs to bridge the knowledge gap both between developed and developing countries and between the scientific community and the society, as well

as mobilizing universities' expertise on state-to-the art policies such as the Sustainable Development Agenda 2030.

Currently there are 56 water-related Chairs in the field of water resources, with the UNESCO Chair International Network of Water-Environment Centres for the Balkans (INWEB), hereafter INWEB, at the Aristotle University of Thessaloniki in Greece to be a member of this UNESCO water family. INWEB is an international network of experts that promotes environmental awareness, training and professional education by using new media and remote learning and aims, among others, to disseminate the concept of Integrated Water Resources Management (IWRM) as an instrument of sustainable development and conflict resolution of transboundary waters (Ganoulis et al., 2014). Moreover, INWEB encourages the integration of Information Communication Technologies (ICTs) for the development and maintenance of web-based environmental databases and inventories (Ganoulis & Skoulikaris, 2013).

The aim of this work is to present the contribution of well-established educational programmes, such as the EU ERASMUS+ programme, as tools for the enhancement of environmental education, with a main emphasis on sustainable management of water resources, at higher education (HE) level. Specifically, three funded ERASMUS+ projects in which the UNESCO Chair INWEB was an active partner, are demonstrated to be successful examples of promoting ESD as well as protecting the environment. Section 2 initiates the characteristics and the necessity for environmental education at three different geographical areas in Northern Africa, South-Eastern Europe, and Northern Central Asia. In Section 3 the objectives of each educational project per geographic area are demonstrated, while in Section 4 the final outputs and achievements are presented. Finally, an overall synopsis and the benefits gained by the implementation of educational programmes in cooperation with UNESCO Chairs are provided in the last part of the paper.

2. Literature review

One of the major environmental and sustainability challenges of the 21st century is preserving and securing water resources. Lack of clean water supply and safe access to freshwater and sanitation increases the risk of economic disruption, social tension, and conflict over water resources at both regional and international levels (UNESCO, 2019). These dangers are even higher in cases where water is scarce, and effective governance is not adequately applied. The uneven allocation of water resources, both seasonally and geographically, the unequal distribution of water among the various users, e.g. industry, water supply, agriculture and environment, together with climate change magnifies the water problem. Regarding climate change, it has a significant impact on water quality and quantity, as well as on the frequency of extreme weather events (e.g. floods and droughts).

The Maghreb area, i.e. Northwest Africa, is a semi-arid to arid zone with limited water resources, facing substantial pressure on the management of its water resources and their protection. Currently, the Maghreb countries have per capita water availability of less than 1,000 m^3, which is the threshold for the water-poverty

level (Oualkacha et al., 2017). It is estimated that due to climate change more than 35% of the population will live below severe water stress ($500m^3$/inh/yr) in the near future (UN-WATER & FAO, 2007). The economic development of the area highly depends on water availability, which also leads to a guarantee of the sustainable management of the environment. Being aware of the situation, the Maghreb countries engaged strategies and master plans (Oualkacha et al., 2017) adapted to the EU Water Framework Directive (WFD) to face water shortage under climate change, satisfy water demands and secure water resources sustainability. However, the efficient implementation of these policies necessitates high capacity building actions to follow-up the proposed political engagements.

At European scale, the majority of countries of the Western Balkan region are not members of the EU. The procedure of entering the EU requires that candidate countries during theirs pre-accession acts must make gradual progress towards transposition and implementation of the EU *acquis*, i.e. to reform, among others, their national educational and environmental legislation by following the EU legislation (articles 2 and 49 of the Treaty on European Union - Joining the EU). On their path to EU accession Serbia, Bosnia and Herzegovina, Montenegro and Kosovo have started to harmonise their legislations to converge the required frameworks. The 2016 EC Progress Report on Serbia (EC, 2016), for example, indicates that regarding education and culture "the ongoing reform of HE needs to put particular emphasis on the relevance of its study programmes" and "the unemployment rate for graduates with tertiary education remains high". As far as the environment is concerned, the same progress report (EC, 2016) mentions that "a national strategy and action plan on water protection have yet to be adopted", as well as "monitoring of surface water and groundwater has improved but needs further strengthening". In Bosnia and Herzegovina's case, the relevant EC Progress Report of 2019 (EC, 2019) demonstrates that in the education sector "achieving the objectives of the Bologna Declaration is a priority for higher education systems" while in the environmental sector "Specific plans for implementing the EU legislation on drinking water, urban waste water and flood risk management need to be adopted".

Russia and Kazakhstan, the two largest countries in Northern Central Asia, present similar problems in their education systems and environmental protection frameworks. Development of HE in these countries for decades suffered from a gap between its content and the demands of the society (Smolentseva, 2007). Strengthening links with local economies and labour-markets, implementation of competence-based, multidisciplinary, and innovative approaches are major priorities for the national HEIs in both countries. At the same time, Russia and Kazakhstan share one of the longest borders in the world (7,512.8 km) as well as the Ob river basin which is one of the largest transboundary watersheds of the world. Large parts of the basin have experienced severe exploitation and disastrous technogenic influence due to the extensive gas and oil industry in the north (Moskovchenko & Babushkin, 2017) and the high concentration of heavy industry in the south. These issues have made transboundary water contamination a most urgent problem.

In all the aforementioned case areas, the reformation of higher education could have a key role in accomplishing the objectives of sustainable development of water resources, by training university students, post graduates and professionals-experts to meet the increasing water related challenges. The proposed group of people should be trained on modern scientific approaches, integrated concepts and the latest engineering technologies for project design, system monitoring and management. Hence, the existing study programmes in these countries must undergo a diversion from a more technical orientation towards a multidisciplinary one, where holistic approaches on sustainable development are prevailing. The multidisciplinary of the water sector becomes evident by the fact that water is not only one of the seventeen SDGs, but cross-cuts almost all the other goals, such as for example SDG 1 (no poverty) SDG 4 (quality education) and SDG 13 (climate action) (UN, 2018).

3. Objectives of higher education environmental programmes

3.1. Environmental education in the Maghreb

The project entitled "Regional PhD School based on Innovative hydro-platform in water and environment to enhance Maghreb inter-research centres" aims at contributing to the water-environmental problems and related needs that are dominant in the specific area. To do so, the three participating African countries, i.e. Morocco, Algeria and Tunisia, are planning to ameliorate their HE system within the framework of the wider process of social and economic reform that is currently conducted in these countries, with the assistance of the EU project partners.

The specific project initiates new PhD courses and new advanced teaching and research methodologies through two modern approaches. Firstly, by using ITCs tools that will secure distanced accessibility to educational material. Secondly, the project proposes the development of the first common regional PhD programme among the three aforementioned African countries. The programme will follow the framework of the Bologna process aiming at improving the quality of postgraduate HE, facilitating the inter-university cooperation, and latterly at improving the background environment, i.e. modern infrastructure in terms of materials and equipment and specialised staff, for research and development purposes.

3.2. Modernization of environmental master programmes in Western Balkans

The aim of the project "Strengthening of master curricula in water resources management for the Western Balkans (WB) HEIs and stakeholders" is to improve the quality of higher education in the water resources management field, strengthen its relevance and linkage with the labour market and society and enhance the level of competences and skills of experts on water resources in the WB countries involved in the project, namely Serbia, Kosovo, Bosnia and Herzegovina and Montenegro. The answer to the previous goals is given by developing new competence-based and

enhancing existing master curricula in line with EU directives and standards, such as the Europe 2020 and the Bologna Declaration.

The project foresees to develop improved learning and teaching tools, methodologies and pedagogical approaches using best practices. The main objectives of the specific project are to i) reform existing water-related courses, ii) upgrade existing laboratories with lab courses, infrastructure, material and teaching tools, iii) train the academic staff towards the new trends on water resources management in order to provide advisory assistance to graduate students and opportunities for contract research while taking into consideration the new resources, iv) strengthen entrepreneurship skills, and v) secure quality assurance of educational programs. Specifically, the newly developed courses will be based on best practices and European principles and will enable harmonized educational and teaching methods as well as credit transfers. An issue of specific importance is the enforcement of the linkage between university studies and employment, thus the entrepreneurial thinking at all levels and directions will be promoted. Compared to the current situation where limited laboratories supporting the educational scope in the field of water resources management exist, the participant countries envisage to develop state-of-the-art laboratories which will allow students to gain hands-on experience directly transferrable to the water sector.

3.3. Industry-Academia learning partnership in Northern Central Asia

The objective of the "Trans-regional environmental awareness for sustainable usage of water resources" project is to contribute to the empowerment of Russian and Kazakhstan by enhancing synergies between HE and enterprises in the field of Transboundary Water Resources Management (TWRM), particularly via enhancing the role of 'Industry - Academia' Learning Partnerships in addressing common educational and environmental challenges.

To achieve the goal of the project, various objectives are proposed such as the development of a trans-institutional model, which also include a specific cooperation strategy, for interaction between HEIs and enterprises in the field of TWRM. The training of academic staff from the regional universities involved within the project, and of employees in the industry is also a fundamental objective. To do so, Life Long Learning (LLL) approaches both for people and enterprises in the water and oil-gas sector are initiated within the project, and, to fulfil this objective new curricula and courses will be designed, based on the European Credit Transfer and Accumulation System (ECTS) in TWRM to train industry partners. The raise of awareness of water problems will be achieved by developing an e-learning interactive platform with educational and dissemination functions which will facilitate the close interaction of the academia and associated partners from authority bodies and enterprises.

4. Outputs and achievements

The implementation process of the ERAMSUS+ project in the Maghreb region is focused on the principal aim of the project, i.e. the creation of a common PhD programme on water environment among the participant Maghreb countries. For that purpose, the initial work was dedicated to the identification of existing postgraduate courses linked to specific tools and models that are used in water resources management, such as geographic information systems and water quality and quantity modelling software. After the enhancement of the identified courses with the latest teaching methodological advancements and their formation in accordance to the EU regulations, i.e. the identification of the competencies, courses' objectives, learning outcomes, the definition of the course's description and the teaching technics, the new courses were approved by the partner University authorities. Thereafter, the common PhD programme was based on a custom developed Hydro-Platform that facilitated distance learning and online course attendance. Apart from serving as a repository of courses material, the platform also integrated various open-source water modelling tools and was used for the training of the academia staff on new open source technologies, as well as a communication hub (web-portal) among the participants. INWEB had a crucial role in the development of teaching materials (manuals) on the use of various modelling tools.

Western Balkan's project strategy was related to higher education knowledge management, knowledge sharing, exploitation, and principles of sustainability. The achievement of the wider aim and specific objectives of the project firstly required i) the identification of WB regional issues related to water resources management and ii) the analysis of EU innovations in water policy and EU recommendations and legislation in the water sector. Prior to the development and implementation of the competence-based master curricula the partnership analysed the existing master curricula related to water resources management in both EU and WB partner countries. Moreover, the identification of the required laboratory resources in WB HEIs resulted in the equipping of several laboratories with modern equipment, software and literature units. Thereafter, the development and strengthening of new or existing master curricula in water resources management was in line with the EU legislation and standards. Also, a set of numerous novel courses were developed and implemented into the master curricula. The produced learning material consisted of learning resources such as text, recorded lectures, data sets, assignments and self-assessment - tests. Additionally, various topic-based training of WB teaching staff for acquiring new teaching and learning methods were organised and hosted by the EU partners. What is also significant, is that the development of the training material for professionals in the water sector was based on a survey that was reflecting the sector's needs in WB and similar LLL courses in EU partner countries.

In case of the Northern Central Siberia ERASMUS+ project, an important asset was the creation, at the beginning of the project, of Interdisciplinary Working Groups (IWGs) that included staff from academic and non-academic partners and facilitated the project activities and the development of specific methodologies and roadmaps for the partnership (academia and employees/enterprises) interaction, such as

evaluating the policy context, problems and solutions for TWRM, conceptualizing and implementing the "Industry - Academia' Learning Partnership model and identifying the requirements for creating new ECTS-based courses. EU partners, as well INWEB, contributed in enhancing the knowledge potential of the HEIs' staff in TWRM by providing a series of lectures and organizing workshops and visits to their host institutions. Moreover, they assisted on the up-dating of the partners's curricula covering issues on the diversity of water ecosystems, water pollution, valuing of water resources, water monitoring and water governance and management. All courses and modules were ECTS-based created and what is of particular importance is that they were commonly agreed with partners from the industry sector. Finally, aiming at the accessibility of the created material, an e-learning platform for HEIs, enterprises and authorities, was developed to ensure wide access to resources and to provide a forum for public debate on water issues. This platform also facilitated the communication links between all relevant stakeholders. It is believed that the successful implementation of the project enforced partnerships of HE with water industry enterprises and oil-gas industry and improved the awareness on the integrity of ecosystems in the river Ob Basin via sustainable water resources management.

5. Conclusions

Three ERASMUS+ projects were implemented in the Maghreb, Western Balkans and Northern Central Asia aiming at reforming the HE of the participant institutions through the integration of sustainable water resources management concepts. In all case studies, the UNESCO Chair INWEB was actively involved as an EU project partner, with both UNESCO's and EU's policies, strategies and frameworks to be disseminated by the Chair. The identified water related problems were addressed by the enhancement of the existing curricula with courses-modules related to integrated water resources management. Incorporating ICTs as indispensable educational tools, perceiving the value of water for various uses and users and investigating policy and water governance issues were among the amendments that were adopted by the HEIs. An additional important output during the implementation process of the projects was the connection between academia and the business sector. For that purpose LLL courses were developed and directed to employees who wanted to obtain up-to-date knowledge. In parallel, a performed market analysis on the business water sector demands was taken into consideration for the formation of the new curricula in order to increase future university students' employability.

The dual role of UNESCO Chairs, i.e. active university structures and "ambassadors" of modern and innovative policies formed within UNESCO by disseminating modern policy decisions, establishing new teaching initiatives, generating innovation through research and contributing to the enrichment of existing university programmes, proved to play an important role at the promotion of the SDGs. At the same time, EU's environmental policy has a pivotal role into all EU sectoral policies with a view to promoting sustainable development in relation with third countries. The Water Framework Directive, for example, is a state-of-the-art and globally accepted framework for the protection and sound use of the water

resources, with numerous non-EU countries ready to integrate it in their legislation. The aforementioned ERASMUS+ projects are characteristic examples of the effort made to enhance national water management with regard to the WFD. A further development of the current research would be the qualitative and quantitative evaluation of the three projects implementation progress in the near future used to identify their operationality, advantages and potential bottlenecks.

The major upcoming challenges on water resources management are closely related with climate change and extreme events, pressure on the environment due to population growth and rapid urbanization, unsustainable consumption and inequitable allocation of the resources. The 2030 Agenda for Sustainable Development, i.e. the SDGs and the various targets are considered the key mechanism for confronting with the aforementioned challenges, while other policies such as the EU Adaptation Strategy to climate change are bound to contribute towards this direction. UNESCO Chairs already have a direct involvement on the achievement of the Goals (Bergnam et al. 2018), but nevertheless there is space for further and deeper engagements.

To sum up, education and particularly higher education is the link between knowledge and relevant quality skills and competences for employability, innovation and active citizenship. The links between different sustainable goals were also studied in the scientific literature (Fonseca et al., 2020). The interwoven nature of water is reflected in global socioeconomic development that could potentially causesocioeconomic imbalance. The solution of regional water problems should take into account local idiosyncrasies, but at the same time they ought to be anchored in broader and long-term strategies and action plans. In any case, education has an important role to bridge regionalities with international perspectives fostering the sustainable development of our world.

References

[1] Bergman, Z., Bergman, M. M., Fernandes, K., Grossrieder, D., & Schneider, L. (2018). The Contribution of UNESCO Chairs toward Achieving the UN Sustainable Development Goals. *Sustainability*, 10, p. 4471.

[2] Cacchione, P. Z. (2015). European Union ERASMUS+ Program and the Jean Monnet Activities. *Clin Nurs Res*., 24(4), pp. 339-340.

[3] EC (2019). *European Commission Staff Working Document: Analytical Report. Communication from the Commission to the European Parliament and the Council, Commission Opinion on Bosnia and Herzegovina's application for membership of the European Union.* Brussels, 29.5.2019 SWD(2019) 222 final.

[4] EC (2016). *European Commission Staff Working Document*: Serbia 2016 Report. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 2016 Communication on EU Enlargement Policy. Brussels, 9.11.2016 SWD (2016) 361 final.

[5] European Union (2013). Administrative procedures. European Commission: Call for proposals Erasmus+ 2013. *Official Journal of the European Union*, C362, pp. 62-65.

[6] Fonseca, L. M., Domingues, J. P., Dima, A. M. (2020). Mapping the Sustainable Development Goals Relationships, *Sustainability*, 12(8), 3359, Published: Apr. 2020.

[7] Ganoulis, J., Quartano, K., & Skoulikaris, C. (2014). Promoting Cooperation for Transboundary Water Security: The Experience of the UNESCO Chair/INWEB. In: R.Q. Grafton, P. Wyrwoll, C. White, & D. Allendes (Eds.), *Global water: issues and insights*, ANU Press, Canberra, pp. 203-214.

[8] Ganoulis, J., & Skoulikaris, Ch. (2013). Interactive open source information systems for fostering transboundary water cooperation. In J. Griffiths, & R. Lambert (Eds.), *Free Flow - Reaching Water Security Through Cooperation*, United Nations Educational, Scientific and Cultural Organization (UNESCO) & Tudor Rose, pp. 96-99.

[9] Le Blanc, D. (2015). Towards integration at last? The sustainable development goals as a network of targets. *Sustainable Development*, 23(3), pp. 176-187.

[10] Moskovchenko, D. V., & Babushkin, A. G. (2017). Oil pollution of the anabranches of the Ob river on the territory of Khanty-Mansi Autonomous Okrug-Yugra. *Geogr. Nat. Resour*, 38, pp. 238-245.

[11] Oualkacha, L., Stour, L., Agoumi, A., Kettab, A. (2017). Climate Change Impacts in the Maghreb Region: Status and Prospects of the Water Resources. In: M. Ouessar, D. Gabriels, A. Tsunekawa, & S. Evett (Eds.), *Water and Land Security in Drylands*. Springer, Cham.

[12] Smolentseva, A. (2007). Educational Inequality in Russia. In R. Teese, S. Lamb, M. Duru-Bellat, & S. Helme (Eds.), *International Studies in Educational Inequality, Theory and Policy*. Springer, Dordrecht.

[13] UN-Water, & F. A. O. (2007). *Coping with water scarcity. Challenge of the twenty-first century*.

[14] UNESCO (2019). *Framework for the implementation of Education for Sustainable Development (ESD) beyond 2019*. General Conference 40 C/23, 3 September 2019, Paris.

[15] UNESCO (2017). *The UNITWIN/UNESCO Chairs Programme: guidelines and procedures*. Document code: ED/PLS/HED/2018/01.

[16] UNESCO & UNESCO i-WSSM (2019). *Water Security and the Sustainable Development Goals (Series l)*. Global Water Security Issues (GWSI) Series, UNESCO Publishing, Paris.

[17] UN (2018). *Sustainable Development Goal 6 Synthesis Report 2018 on Water and Sanitation*. New York.

[18] UN (2015). *Resolution adopted by the General Assembly on 25 September 2015*, Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1).

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Limits on Sustainability at the Crossroads ’20

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Abstract

By this statistical reference of 2020, several sustainability programs, which have been ratified and launched worldwide at UN or EU summits and other platforms, have not achieved their objectives or achieved them only in part. Two important crises − the financial one from 2008-2010 − and the pandemic which appeared at the beginning of 2020, add to some barriers more or less inherent in the planned and desired development of sustainable development programs. While some structural limitations - for example, on non-reduction of greenhouse gases to the desired level − have been researched, debated and combated practically well enough, others − such as, for example, non-eradication poverty and the non-qualitative rise of the educational level, did not enjoy the same attention or effective practical amendments. But the most neglected limits were those of a superstructural nature − such as, for example, those concerning human behaviour. The lack of an integrative and interconditional vision through which all the dynamic components of the sustainable approach are to be approached unitarily, simultaneously and interdependently, determined us to reconsider in part the sustainability paradigm, proposing here a new approach, based on a three-dimensional tool and, hopefully,, more operational and more suggestive.

Keywords: sustainability, sustainable development, limits of sustainability, sustainability crises.

JEL Classification: Q01, Q56, Q54, H12

Acronyms:

SD – Sustainable Development
UNFCCC – United Nations Framework Convention on Climate Change
WCED – World Commission on Environment and Development
WSSD – World Summit on Sustainable Development, Johannesburg, South Africa, 2002
UNCED – United Nations Conference on Environment and Development, Rio de Janeiro, 1992
UN – United Nations
EU – European Union
SSP – Super Sustainability Program
GES – Greenhouse Gas

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1. Introduction

The sustainable approach, designed by scientists to help the world move from a civilization of subsistence surpluses to one with a harmonious consumption balanced with the vitality of the natural environment, is based on so many programs and projects that their correlation and congruence have proved very difficult.

The need to interconnect and intercondition superstructural factors with structural ones, as well as the correlation of all of them with other essential components of the sustainable approach, inspired the authors of this material, its vision and concept, "Super Sustainability Program" (SSP). It covers virtually the entire sustainable approach, containing all programs and projects, including all specific and characteristic issues. And beyond the content of the idea, the authors imagined for SSP and the configuration of a working tool suitable for connecting any problem with the rest of the system.

In the modest vision of the authors, SSP can also benefit from a linguistic super-valence: it gives the sustainable approach, (in the most formidable way) a psychology of ample quantity and a superior quality, suggests the passage of the sustainable approach in a new historical stage and finally, one can enjoy an increased sympathy among the new generations - more inclined towards a "sensational" terminology.

2. Literature Review and Problematization

In the almost thirty years of substantiation and sustainable practice, a whole series of punctual criticisms have been elaborated, respectively, for many specific and characteristic coordinates of sustainability. Still, as the authors of this study appreciate, an integrative vision was approached too rarely.

The number of limits of the sustainability super program is much higher than the one processed here. This aspect refers to the idea of a much broader and more profound study. Until then, the authors of this research aim to offer a brief introduction to the problem, as an alarm signal, with what was revealed to them more strongly from the related documentation.

1) The first limit of the sustainability super program on which the analytical collimator of the present study will be set is the exaggeration of the trust of most people in some of the components of the sustainability super program alone, obviously to the detriment of others. As a result, there has always been a concentration of confidence in, for example, the chances of science and technology to solve the fastest and most efficient ecological problem of depollution of the GES (greenhouse gas) atmosphere - as the most significant reduction in sustainability.

However, their meanings, thus designed with a constructive character, have often been deviated and speculated in a completely different direction from the projected one.

It should also be noted that the false idea of excessive and / or almost exclusive trust in the fields of "science and technology" - obviously while minimizing the importance of others -, was credited as such by the Johannesburg World Summit

(Sustainable Development Implementation Plan (WSSD, 2002), which set out how to implement Agenda 21 (Rio). In a scientific article published 15 years ago, the authors warned about the exaggeration mentioned above, giving as examples some paragraphs of the summit document - 97, 106 and 108 (Nath and Kazashka-Hristozova, 2005).

The final documents of the South African summit "encouraged", among others, the most developed countries to build increased capacity in science and technology and to transfer green technologies to developing and transition countries. Thus, the problem of promoting science and technology from the forum of the highest form of sustainability was presented both by the (intrinsic) virtues of science and technology and by the value of their export to less developed economies. It was just a matter of subjective interpretation for economically strong countries because, after all, no matter how non-ecological (read "polluting") the technologies they relocated from their territories to a world far behind were, they were received with open arms.

At the same time, as things are interconnected in the sustainable system, the excessive focus of attention and action on the science and technology components has widowed, among other things, the role of sustainable education - especially the younger generations which, for decades to come, could have meant, without a doubt, the most determining factor of the sustainable offensive.

Other authors point to the existence of a current focus on the importance of production and consumption as factors conducive to sustainable development, which also means a wrong focus on only some of the directions of action of the sustainable offensive (Bell & Morse, 2003).

Unfortunately, the practice of about thirty years of the sustainable offensive has shown that science and technology alone are not able to bear the brunt of sustainable transition, and therefore to insist on overestimating them means nothing more than cultivating a false idea (Nath and Kazashka-Hristozova, 2005).

The problem with this limit is not the exaggeration of confidence in the success of some of the components of the sustainable super program itself, but the fact that this focus of all people's attention and efforts on only a small part of the sustainable whole has had multiple and severe repercussions over nearly three decades.

2) The second limitation of the sustainable programs developed so far results from those mentioned above. It consists in the naivety of many people to hope in (a kind of ...) miracle - as hypothetical potential elements of scenarios in which things are solved overnight. No one is saying that the world should not remain optimistic about the success of sustainability, but overconfidence in miracles can only be an unrealistic attitude. Seeing, for example, a miracle in reducing the world's ecological footprint for 2020 - as reported by the Global Footprint Network - is a misguided direction, especially when everyone already knows that this relatively "success" is actually due to the medical crisis triggered by the Sars-Cov-2 virus.

The author of a scientific article from 2018 states that miracles which are not purely scientific fall into pseudo-sciences (Afisi, 2018). He argues that miracles do not observe methodically and experimentally and do not commit to advance firm empirical evidence.

3) The problem of the limit of understanding the systemic character of the approach of sustainable development is correlated, in the most obvious way, with the limit of the exaggeration of the trust in some of the components of the programs and projects of the field alone. Sustainability, as a system, must be perceived and approached in a balanced, symbiotic and synergistic spirit, because there can be only one methodical principle in addressing any problem: the systemic approach (Capra, 2015).

And as most sustainability issues overlap with humanity's biggest problems (i.e. hunger, military conflicts, climate disasters, emigration, etc.), it becomes clear that the sustainability superprogram will resonate interactively with the societal system in times of crisis, such as the current health crisis generated by the Sars-Cov-2 virus, which "infected" all major societal components: social, economic, cultural, and educational. Immediately, almost the entire supersystem of sustainability interacted with the societal system and went into stand-by. Many sustainable programs and projects froze during the crisis, and some of them even collapsed, some no longer deemed being appropriate for the post-crisis period (Romanian Academy, 2020; Filho et al., 2020).

Speaking then, in the sense of the correct understanding of sustainability as a system, there is also the formula advanced by the Swedish ambassador to Bucharest - Mr. Stefan Löfven, during an interview on September 27, 2019: "The climate crisis is the crisis of humanity".

In the meantime, however, the world has come to understand more and more correctly that the effort must be constant and united from all major components of the sustainable development approach: from ecology - especially as safeguarding and rehabilitating the natural environment, from the economy - especially as management and equitable exploitation of natural resources but also as technological efficiency, and from the social point of view - especially as a rationalization of consumption, as scientific-intelligent management of activities of all kinds, as sustainable education, especially of the younger generations. The systemic approach is thus revealed as the only logical solution for action towards the concrete approach of sustainability. However, there are still many steps to be taken in this direction.

Capra (2015) also supports the idea that a systemic solution cannot solve any problem if it does not take into account the context of other related issues (Capra, 2015).

4) The fourth limitation consists in the loss of sight of man as a central goal of the sustainable approach. Many scientists, politicians, and businessmen approaching the issue of sustainability as an abstract concept, refer instead to some environmental elements (water, air, soil) or some economic aspects (energy consumption, pollution reduction, technological efficiency).

However, the idea of involving as many people as possible in the sustainability programs - although it has been incorporated since 1992 in Principle 10 of the Rio Declaration ("*Environmental issues are best addressed with the participation of all citizens involved person should have... [information] and the opportunity to participate in decision-making processes*"), was forgotten and decisions have since

been the sole prerogative of only a few scientists, technocrats, politicians , managers or business owners.

They have thus lost sight of the most potential proactive factor of sustainable action and at the same time, the most important recipient of sustainable action. Sustainability decision-makers need to understand and consider people's values and needs, rather than building ideas and norms from their own, often far too technical, perspectives (Kessler et al., 1992).

The fourth limitation is found as a concern in the attention of many authors. They point out, among other things, that the development of sustainability, both as a theory and as a practice, means nothing, for most researchers, in the absence of people (Gatto, 1995). Sustainability must be an idea that everyone can understand, something that everyone can connect to and express a personal opinion about, not just scientists and technicians (Bell and Morse, 2003). Some authors assure everyone that they have scientific evidence that public confidence in scientists, and even less so in politicians, is at a low level in much of the developed world (Pinfield, 1996; MacNaughton et al., 1995).

5) Correlated largely with the previously set limit, the issue of the hegemony of decision-making becomes here the fifth limit of the sustainability programs, carried out until 2020.

The practice of rehabilitation of the natural environment carried out so far demonstrates that the establishment of the norms in the matter by the representatives (politicians and ecologists), followed by the conformation of the masses, is not a fruitful one. The masses perceive ecological acts with a psychology similar to all administrative constraints that come "from above"; no one consults their opinions, no one respects their wishes; they are only asked to comply. Some authors point out, for example, how the lack of involvement of farmers in a participatory manner, from the design to the implementation phase of sustainability programs in the field, has led to the failure of negligently proposed programs from "above" (Wurzinger, Sölkner, Iñiguez, 2003).

How much sustainability should be in a "top-down" process, led primarily by technical specialists, and how much should be in a "bottom-up", driven by dynamic public participation, is a matter existing all the time under debate. Simon Bell & Stephen Morse (2003) believe that the viable solution could be a compromise between the two directions. Although reconciling top-down and bottom-up visions can be problematic, it is a mandatory necessity because it depends on the level of trust between these different groups and, in addition, on the involvement of all people in a united effort (Crilly et al., 1999).

6) The sixth limitation of sustainable development programs and projects is the hyperconcentration of the factors involved (researchers, politicians, entrepreneurs, etc.) on the symptoms of sustainability, on treating serious problems after they begin to manifest, but not on etiology or prevention. This conventional approach cannot make significant progress on the sustainability superprogram (Nath & Kazashka-Hristozova, 2005).

7) The seventh limit concerns the anachronism of the laissez-faire economic model, characteristic of traditional capitalist liberalism, but which, through the free market mechanism of satisfying consumer demand and creating new needs, is no longer compatible with the desideratum of the sustainable approach. The economic model of "laissez-faire" does nothing but maintain a greedy and hedonistic lifestyle (Nath & Kazashka-Hristozova, 2005).

The limit of the economic model of the "laissez-faire" type (characteristic of traditional capitalist liberalism) has also been repeatedly recorded in the scientific literature. Researchers believe that a steady increase in the production and consumption of goods and services, which the dominant economic laissez-faire system demands for its proper functioning, is a very consistent barrier to achieving a modest degree of sustainable development (Nath, 2003). The most delicate part of the revolution of this free market mechanism is that it is difficult to imagine how more affluent people could, quite quickly, adopt a less energy-intensive lifestyle, and thus, more friendly with the natural environment (WCED, 1987).

8) The insufficient non-education of the new generations in the most authentic sustainable spirit but also the non-education based on a strong general culture, can represent in the light of the '30s of this century, the most significant error of the sustainability of the first two decades. The problem has several causes, but the most cited is that the rich will simply not agree to adopt more restrictive lifestyles in terms of consumption.

Much of the scientific world now agrees that the level of education of the last two generations has become precarious, either because of the wrong direction it has experienced in recent decades or because of the shift of the traditional education system to attitudinal and behavioural reality of today's youth. The inadequacy of educational methods has led to the inability of the education system to cope with change and, accordingly, to limiting the access of new generations to the fund of fundamental and authentic knowledge. The lack of healthy culture of young people becomes alarming in the perspective that some of them will have to become the leaders of tomorrow's society, deciding for the fate of their peers and the planet as a complex ecosystem (Romanian Academy, 2020).

Therefore, the evolution of the traditional mentality must move, through education, from the brutal exploitation of the resources of the natural environment to the real respect and concern for it (Nath, 2003). Some authors build the limit of sustainable education on the unfortunate fact that engineering and related fields of education have ignored vital issues such as ecology and sustainability (Ouinn, Gaughran, and Burke, 2009).

Other authors argue for the importance of education for the success of sustainability. One of them criticizes the little attention that has been paid to the field and the fact that there are serious problems related to the subsumption of the term “education for sustainability” (Jickling, 2003). Therefore, the hypothetical "new education" becomes, at some point, a very potential lever for the success of the radical transition of mentalities and behaviours.

The challenge of this paper is that precisely based on the appreciation of the two kinds of factors / limits / principles of the same value, to find an effective way to inextricably integrate them into a sustainable unitary system, coherent and authentically scientific - respectively to reduce arbitrariness, improvisation, fantasy and subjectivism which have continuously characterized the political decision and group interests until this crossroads year, 2020.

Refocusing attention on the importance of superstructural factors therefore implies a sharper and deeper focus of research on behavioural theories: Theory of Planned Behaviour - TPB and Rational Choice Theory - RCT.

It is easy to see from everyday life that most political leaders and business people are not able to focus on more than one problem, and when another problem overlaps, they move it elsewhere. This is the case with the obsessive increase in energy production on traditional agents, at the same time, ignoring the problems of climate stabilization, biodiversity, or public health. In other words, these "important" people are not usually able to interconnect the big problems. Maybe they are really well-intentioned, but they lack a tool with which they can become more clairvoyant.

3. Methodology

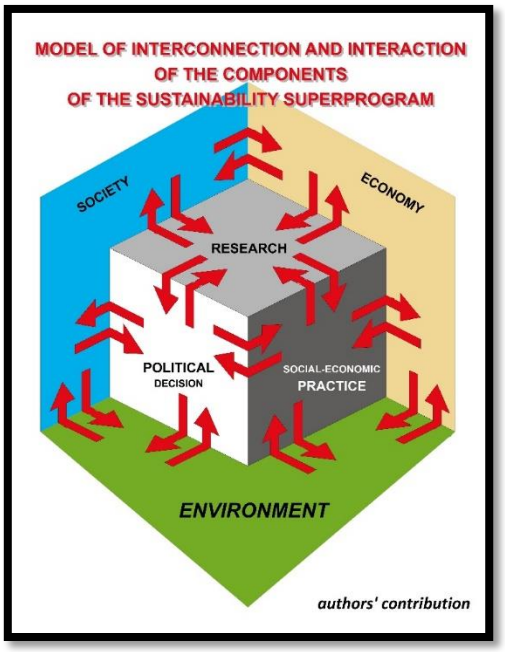
In the theory of sustainability, the idea that there are three major areas, interconnected and implicitly interactive, on the contribution of which sustainable success is based has been established from the beginning: the economic environment, the social environment and the natural environment. That is why these three major components have been called "pillars of sustainable development". However, these essential active components must be considered individually but also as a whole, both causes and effects, both purposes and conditions. However, the Venn diagram that represents this concept has a too static visual character.

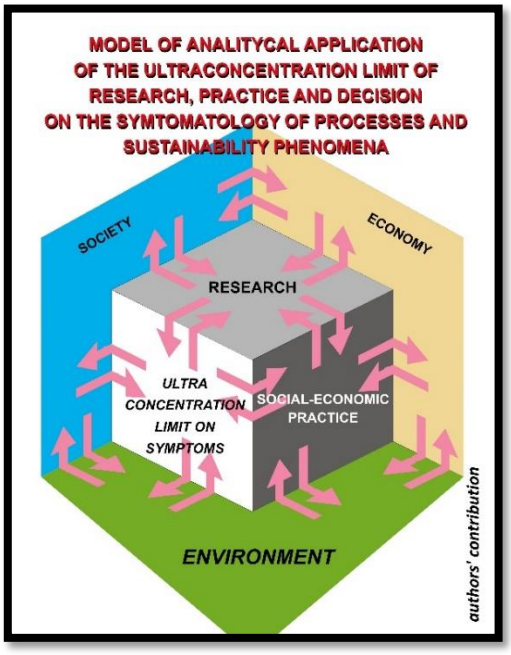
At the same time, however, the analysis of the limits of the attitudinal-strategic components of sustainability reveals three new categories of sustainable levers - research, political decision and socio-economic practice - which, in turn, are interconnected with the major components present in the Venn Diagram.

Starting from the idea that the Venn representation - as a diagram with three fundamental components of the structure of sustainability (social, economic and natural environment), is a less suggestive formula for the complexity of the sustainable problem, this study proposes a three-dimensional and exciting representation, in response to the need for a new vision of overall systemic sustainability. From the point of view of technical schematics, the present model is noticeably close to Osterwalder's 2005 "Canvas" model.

In all honest modesty, SSP does not claim a traditional methodological invention, but claims the merit of a revolutionary methodical reconsideration both as a concept and as a spatial (or three-dimensional) visual, unitary-systemic representation of the whole sustainable issue - to be adoptable as a working tool.

Figure 1. The three-dimensional (axiological) model of the Super Sustainability Program - SSP, includes mainly six interconnected components (left) and Example of systematization of a sustainable development problem (right)





Any problem - be it a limit, a constructive approach or the promotion of an idea, can be substituted for the field in which the invoice or its fundamental nature is limited and can be analysed according to its immediate and generic connections. For example, if the idea of a sudden ban on diesel mobility - a hypothesis based, obviously, on the principle of reducing toxic gas emissions into the atmosphere - arises in the political environment, a (re) research is immediately required, according to the application of the SSP, to reveal both the potential socio-economic impact and the potential psychological, moral and ethical impacts on the population.

Obviously, the SSP model does not exhaustively solve any problem, just by inserting the reason in its related system. As in the applications on Canvas, a detail and, accordingly, a deepening of the issue proposed for analysis is needed. In the post-system analytical phases, the interconnections can be represented in two dimensions.

Figure 2. On a second level of analysis, solutions of principle are proposed for the fields of the central components, correlated with the problem considered initially

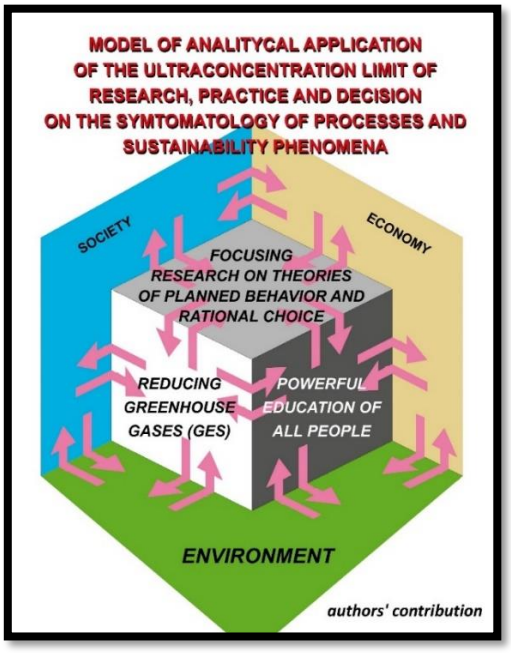
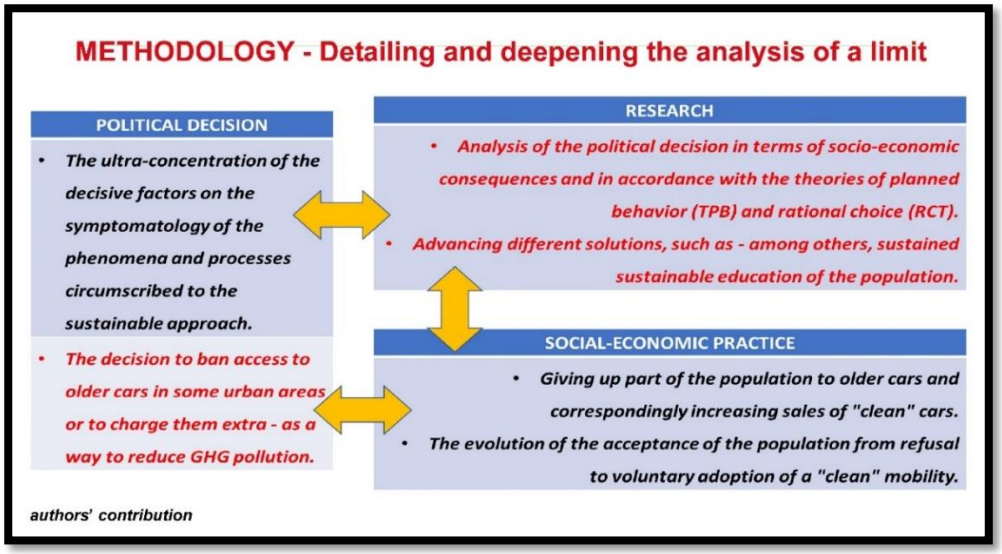


Table 1. After discerning the most appropriate systematization of a limit or any problem, a thorough analysis follows, often based on value data, which is essentially conceived to solve an efficiency equation. The circumstantial importance of the components (or "variables") has an interpretable aspect, which means that it can be better defined, the better the analyser masters the issue of sustainability



4. Results and discussions

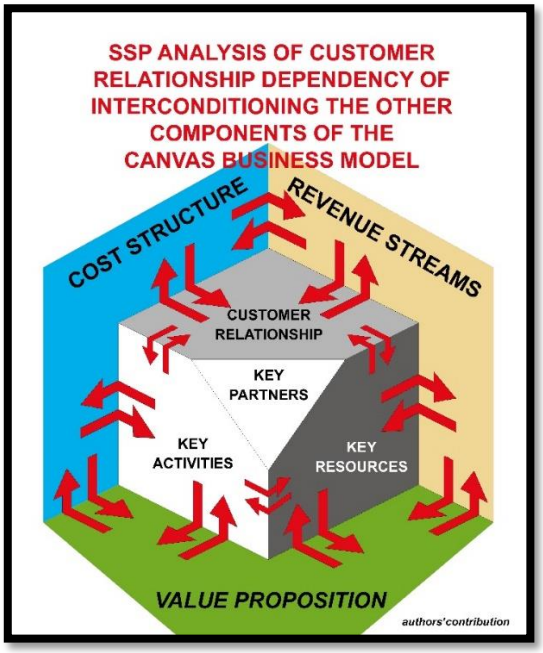
Therefore, the policy decision on the issue of reducing greenhouse gas emissions must ask Research for solutions based on attitudinal and behavioural theories, but also taking into account the foreseeable social and economic consequences.

If there is any difficulty with the SSP mechanism, it is not so much the scope and difficulty of analysing and synthesizing the problems as it is the discernment of the initial classification or assimilation of each problem in the related field. This discernment is a process similar to putting the unknown into the equation or putting any idea into context.

The operationalization of the method is based to a considerable extent on the procedural principle "input-output", the approach of the problems through SSP supposing, often, the first step in initiating a research, up to value / mathematical levels. At the end of the analytical and synthetic operations, the economically decoded results must be interpreted in a moral or ethical key.

The comparison of SSPs with the Canvas Model is made only in the relativity of the differences between their fields of action: putting in the entrepreneurial or managerial equation some characteristic factors, often even valuable. The similarity of the two concepts consists in the interdependent character of the processed elements, but SSP reveals more suggestively the interdependence of the invoked components for any approached application.

Figure 3. An example of the assimilation of an entrepreneurial problem in SSP



More dynamic in its intimate physiology than a Venn Diagram and more convincing than a Canvas, the SSP visual model will also benefit from the hypothetical empathy of the younger generations, more inclined to superlative terminology.

5. Conclusions

The few limits and problems of a sustainable nature that the authors checked revealed a leitmotif or a common denominator: poor educational quality. At the empirical level, observation reappears obsessively or strikingly in many discourses. Against this truth, it is necessary for the Research to send the strongest and most immediate signals to the average political decision maker.

Ultimately, SSP is a plea for the further humanization of economics and the business world, as well as an impetus for research, to take a more nuanced approach to the importance for humanity of behavioural factors the neglect of which has generated unforgivable limits of sustainable action.

If the masses were no longer ignored, if people began to feel the direct participation in the great political-administrative decisions, a common mobilizing motivation would be generated, capable of true miracles - as it proved to be constructive in many periods and historical episodes. By its nature, education - in this case, sustainable education, is suitable for relatively medium and long-term programs. But for its success, an immediate and strong start, followed by continuous support is essential.

References

[1] Afisi, O. T. (2018). Of Science and of Miracles, Journal of Religions and Peace Studies. 3(1), pp. 1-9, https://www.researchgate.net/publication/335565914_of_science_and_of_miracles.

[2] Bell, S., and Morse, S. (2003). *Measuring Sustainability. Learning by Doing*, First published in the UK and USA in 2003 by Earthscan Publications Ltd, ISBN: 1 85383 843 8 paperback.

[3] Capra, F. (2015). *The Systems View of Life – A unifying conception of mind, matter, and life*, Cosmos and History: The Journal of Natural and Social Philosophy, 11(2), www.cosmosandhistory.org.

[4] Crilly, M., Mannis, A., & Morrow, K. (2007). Indicators for change: Taking a lead, *The International Journal of Justice and Sustainability*, 4(2)/1999, DOI: 10.1080/13549839908725590.

[5] Filho et al. (2020). *COVID-19 and the UN Sustainable Development Goals: Threat to Solidarity or an Opportunity?,* Licensee MDPI, Basel, Switzerland.

[6] Gatto, M. (1995). Sustainability: Is it a Well-Defined Concept?, *Ecological Applications*, 5(4).

[7] Jickling, B. (2003). Environmental Education and Environmental Advocacy: Revisited, *The Journal of Environmental Education*, 34(2), pp. 20-27; DOI: 10.1080/00958960309603496.

[8] Kessler, W. B., Salwasser, H, Cartwright Jr., C. W., and Caplan, J. A. (1992). New Perspectives for Sustainable Natural Resource Management, *Ecological Applications*, 2(3), pp. 221-225.

[9] MacNaughten, P., Grove-White, R., Jacobs, M., and Wynne, B. (1995). *Public Perceptions and Sustainability in Lancashire: Indicators, Institutions, Participation*, a report by the Centre for the Study of Environmental Change, Lancashire University, Lancashire Country Council, Lancashire.

[10] Nath, B. (2003). Education for Sustainable Development, *The Johannesburg Summit and Beyond, Environment, Development and Sustainability*, 5, pp. 231-254, https://doi.org/10.1023/A:1025309105929.

[11] Nath, B., and Kazashka-Hristozova, K. (2005). Quo vadis global environmental sustainability? A proposal for the environmental education of engineering students, *Int. J. Environment and Pollution*, 23(1).

[12] Ouinn, S., Gaughran, W., & Burke, S. (2009). Environmental sustainability in engineering education – Quo Vadis?, *International Journal of Sustainable Engineering*, 2, https://doi.org/10.1080/19397030902947033.

[13] Pinfield, G. (1996). Beyond Sustainability Indicators, *Local Environment*, 1(2), pp. 151-163.

[14] Romanian Academy (2020). *Reset of the World Economic Order. Pandemic – The New Dark Face of Globalization*, "Costin C. Kiritescu" National Institute of Economic Research, Bucharest.

[15] UNCED (1992). *United Nations - Agenda 21*, Rio de Janeiro.

[16] WCED (1987). *United Nations Report of the World Commission on Environment and Development (Brundtland Report): Our Common Future*, http://www.un-documents.net/our-common-future.pdf.

[17] WSSD (2002). *World Summit on Sustainable Development*, Johannesburg Summit, Johannesburg, South Africa, https://sustainabledevelopment.un.org/milesstones/wssd.

[18] Wurzinger, M., Escareño, L., Pastor, F., Salinas, H., Iñiguez, L., and Johann Sölkner, J. (2013). Design and Implementation of a Community-Based Breeding Program for Dairy Goats in Northern Mexico, *Tropical and Subtropical Agroecosystems*, 16, pp. 289-296.

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Social Media Channel as a Strategic Advertising Tool for Small and Medium Enterprise (SME's) Sustainability: Evidence From a Developing Nation

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Abstract

The purpose of this paper is to examine the effectiveness of using social media channel as an advertising tool for Small and medium enterprise (SMEs) sustainability, particularly, in a developing country. SMEs are seen as a major contributing factor for business development, employment creation, production of goods and services, and internal income generation in the globe among others. The advent of smartphones and other digital devices has further enabled an increased adoption of this new paradigm. Nonetheless, few attempts have been made by researchers concerning the effectiveness of the adoption of social media as an advertising tool for the sustainability of SMEs in Ghana. Hence, the researchers relied on a qualitative approach basically, an interview method to achieve the objective of the study. This is because the researchers wanted first-hand information from owners/managers of selected known SME's in the regional capital of Ghana. The interview approach was therefore conducted through a questionnaire form. Per the results derived, it can be concluded that social media would serve as a strategic advertising tool for small and medium enterprises. Again, it was emerged that the existence of social media has therefore answered numerous challenges faced by today's SMEs in the area of advertisements. The theoretical benefit of this study will contribute to the body of knowledge on SMEs, by extending the frontiers of using social media as an advertising tool by SMEs in Ghana. Practically, this research will enable industry players to make sound policies and strategies that could attract both experienced and new business on the need to incorporate social media channel for SME's growth and development.

Keywords: Social media, Strategic advertising tool, SMEs, Sustainability, Ghana**.**

JEL Classification: A13, L25, Q01, Q56, M37

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1. Introduction

The coming into existence of social media through the introduction of smartphones in the world has brought about a new paradigm in the advertisement of businesses of Small and Medium Enterprises (SMEs) (Jibril, Kwarteng, Chovancova, & Pilik, 2019; Kwarteng, Jibril, Nwaiwu, Pilík, & Chovancova, 2020). Small and Medium Enterprise has contributed immensely to the growth of both developing and developing countries in job creation, improving the standard of living, Gross Domestic Products(Amoah, 2018; Kumar, 2017; Abou-Shouk, Lim and Megicks, 2016). Social media are the various internet-based platforms that allow users or the public to generate and share ideas, pictures, videos, information, interests, and other expressions to the general public(Jibril, Kwarteng, Chovancova, & Pilik, 2019; Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). Social media according to Birkner (2011) could be adopted by business enterprises of different types and sizes as a promotional tool because of its effectiveness. Unlike traditional communication networks like radio and TV, social media enable SMEs to relate with customers or consumers at the right time, directly with lower cost and higher efficiency. Social media as an advertising tool have become very powerful for SMEs since customers and consumers of today sought information about the firm's products and services through it. Because of this, most SMEs have adopted it since customers prefer using it for information search. The effectiveness of social media has made it possible to compare promotions, offers, and services from several businesses to find the best offer (Darban and Li 2012).

Similarly, social media have several outlets that Small and Medium Enterprise use to enjoy its benefits of sustainability such as Facebook, LinkedIn, Instagram, and Twitter (Almeida & Santos, 2020; Bacik, Fedorko, Nastisin, & Gavurova, 2018). One of these platforms is usually used by SMEs (Dincă, Dima, & Rozsa, Z., 2019) to run promotions that have sustained SMEs in developing countries like Ghana. Mostly, SMEs choose a particular site to dwell on it based on the number of individuals who patronize that social media platform and how easily it can be assessed by its consumers or customers (Greenwood, Perrin, & Duggan, 2016). The effectiveness of social media for SME's sustainability was also indicated by Kaplan & Haenlein, (2010) that delivering goods and services is directly consumed by consumers at an affordable price and on time without delay. Moreover, the effectiveness of social media has blended two-way communication between consumers and SMEs for businesses and initiates the opportunity to associate and loop feedback effectively. Additionally, Georgi & Mink, (2013) also admonished that consumers or customers interact with SMEs on these social media sites and express concerns with the immediate reply received. Mangold & Faulds, (2009) revealed that the effectiveness of social media usage for advertisement for SME's sustainability improves Brand awareness, acquisition of information, purchase behavior, and post-purchase communication and evaluation of consumer decision making processes. The aim of this study is to access the effectiveness of social media as a strategic tool for small and medium enterprises in a developing nation

and also identify the various social media platforms that can be used by small and medium enterprises.

2. Problem Statement

However, several studies have examined why customers are attracted by social media and their significance (Hollebeek et al., 2014; Malthouse et al., 2016; Jibril, Kwarteng, Chovancova, & Vykydalova, 2019). Despite this, Sabate et al., (2014) admonished that social media sites like Facebook attract numerous customers and therefore impact positively on Small and Medium enterprises. Lee, (2017) suggests that the social media market has grown exponentially from $1.6 billion in 2015 to $5.4 billion estimated by the year 2020 with an expected growth rate of 27.6%. This increment is attributed to social media users, which have necessitated SMEs to use them for effective advertisement. Gamboa & Gonçalves, (2014) pinpoint that attraction of social media was very effective due to its creation of brand awareness and also a vehicle for winning customer loyalty. The said literature also revealed that social media sites have created a new opportunity for marketing managers to achieve planned promotional results or targets.

Similarly, (Sabate et al., 2014 and Dincă, Dima, & Rozsa, Z. 2019) revealed that social media have increased based on their importance and channel of information gathered about products and services of Small and Medium enterprises. The said literature concluded that social media shaped the ways of interactions, communication, decision making, socialization, collaboration, learning, and above all entertaining in doing shopping. Harrigan et al., (2018) argue that social media underpinned that customers can make right and rational decisions concerning costs and benefits concerning a particular product or service of the small and medium enterprise. However, Guo et al., (2017) also placed much emphasis on the fact that social media attraction for customers has increased in recent times because two parties in an online relationship usually come with benefits, both economic and social. Social media are identified to be a new key to media phenomenal. Gamboa & Gonçalves, (2014) insisted that social media through Facebook have enhanced the communication process for customer satisfaction, perceived value, and commitment.

The effectiveness of social media has positively impacted SMEs financially and their organizational performance (Botchway, Jibril, Kwarteng, Chovancova, & Oplatková, 2019; Seiler, Papanagnou, & Scarf, 2020). Social media through Facebook have also positively influenced SME's performance(Apenteng, Ekpo, Mutiso, Akowuah, & Opoku, 2020). Similarly, a publication by Gligor & Bozkurt, (2020) also admonished that SMEs are positively enjoying increment in their financial performance as a result of social media effectiveness as an advertising tool and their engagement with customers. Odupitan, (2017); Nasir, (2015) suggest that the financial ailment of SMEs has been solved through the effectiveness of social media. The usage of social media for advertising has effectively offered a comparative advantage for growth and development(Bianchi & Andrews, (2015).

Ainin et al., (2015) highlighted that social media like Facebook positively affect the SME's financials to meet their financial obligations. The study further revealed that SMEs strongly focused on Facebook to adequately ensure that cost reduction in marketing and customer service are obtained since their expenditure is affected.

Majchrzak et al., (2013) revealed that social media create business opportunities for SMEs in idea conception and modification of their products to the satisfaction of their customers. Therefore customers' interests are always met through regular communication with them. Furthermore, a publication by Zhang & Pentina, (2012) and that of Jibril, Kwarteng, Chovancova, & Pilik, (2019) also admonished that social media integration through Facebook, Youtube, etc has helped SMEs in marketing intelligence. Scuotto et al., (2017) proved that innovation and customer demands are met through the usage of social media as an advertising tool based on their effectiveness. Madrid-Guijarro et al., (2009) necessitated that social media were initially rejected by SMEs due to their costs, but later adopted them because they create business opportunities and intensify strategies for SMEs. Therefore SMEs are significantly enjoying innovation and business strategy as initially enjoyed by large companies. Smith & Gallicano, (2015) in their article established that social media usage has been considered to be strategic for organizational benefits.

Despite a growing concern that SMEs can catalyze the growth and development of Ghana, the growth of SMEs in Ghana is considered to be very low due to many challenges in their advertising strategies in both research and practice. Nevertheless, it is found that one in five small businesses does not have a strategy for the use of social media (SMB Group 2012). The theoretical implication of this paper will contribute to the body of knowledge on SMEs, specifically, on using social media as an advertising tool by SMEs in Ghana. Also, the research will enable practitioners to make sound policies and strategies that could attract both experienced and new customers by using social media as an advertising tool. This paper is outlined as follows: the key literature on social media effectiveness on SMEs sustainability in section two. Section three also covers the conceptual framework and hypothesis development. Section four reveals the methodology and sources of data for the empirical analysis of the study, while the theoretical and practical relevance, conclusion, and limitations are discussed in sections five and six respectively.

3. Research Questions/Aims of the Research

The main aim of the study is to access the effectiveness of social media as a strategic tool for Small and medium enterprises. The outcome of the study is expected to be significant to SMEs and other firms as it will outline the impact of social media on the sustainability of SMEs thereby designing and implementing policies on advertising using social media as a means.

3.1 Research Questions

1. To what extent are social media effective to be used as a strategic tool by SMEs in a developing nation?
2. What are various social media platforms or tools used by SMEs?

3.2 Research Objectives

1. To access the effectiveness of social media as a strategic tool for small and medium enterprises in a developing nation.
2. To identify the various social media platforms used by SMEs.

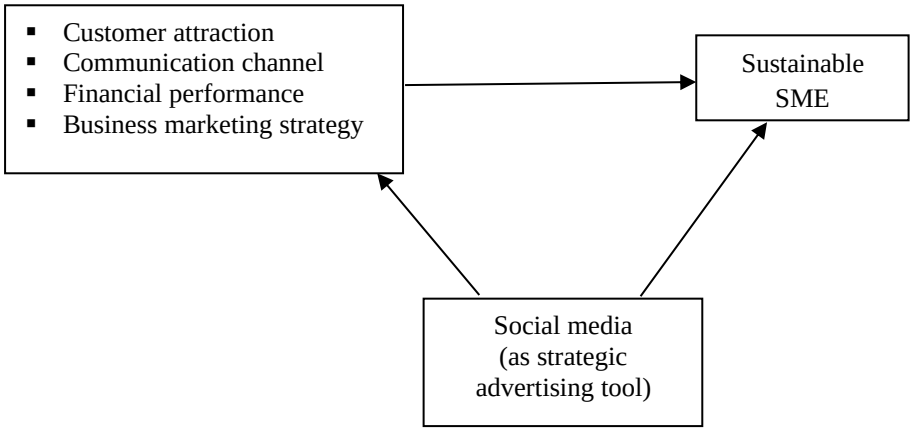

Figure 1. Proposed Conceptual Model
Source: Authors' own

4. Methodology

Per the researchers' prior objective of the study, a qualitative approach, specifically, the interview method was adopted. The interview approach was chosen mainly because first-hand information was our primary aim and also to have access to owners/managers since they are the main implementers of the social media adoption for various advertising purposes and also to retrieve in-depth information. The interview approach was also seen as a simplified process to carry out the study as used by various researchers and scholars (Elghannam et al., 2020; Tambovceva et al., 2020; Media & Force, 2017). To achieve this, 10 managers/owners of small and medium enterprises were selected using non-random sampling technique (particularly, convenience sampling technique) from the regional capital of the country, which includes; five from the rural banks' sector, three from manufacturing, and two from the hospitality industry all in the service sector of small and medium enterprises. In addition to that, some experts' opinions were also adapted to technically arrive at the finality of the study. It is important to note that the objective of the study was achieved through the interview

approach in the form of unstructured questionnaire, which was done through face-to-face interaction coupled with video interview too. The face-to-face approach was executed at the premises of these participants, while ensuring the COVID-19 protocols, whereas, the video version was conduct for those who agreed to do it so due to their busy schedule coupled with the impact of lock-down as a result of the Corona virus pandemic. Out of fifteen questionnaires proposed, ten were duly answered correctly and were appropriate for the analysis within the study. From the data received, a conceptual framework has been proposed, which further provides partial objectives to the study as shown in figure 1. It can therefore be said that the interview approach offered enough grounded evidence that social media can serve as a strategic advertising tool for small and medium enterprises.

4.1 Summary of Findings (A Qualitative Interview)

Table 1 below depicts the summary of findings from the qualitative interview conducted and responses elicited from ten managers of Small and Medium Enterprises in Ghana in the service sector.

Table 1. Summary of Findings from Qualitative Interview with Selected SMEs Managers

Industry Type	Social Media Type	Constructs Measured	Literature Sourced	Summary of Respondent's Comments	Researchers' Comments
Rural Banks	Websites	Customer Attraction	Öztamur & Karakadılar, (2014), Gao & Lee, (2017), Kim et al., (2015)	With the wide reach of social media in recent times and people's willingness to spend more time online, it is one of the best channels to attract lots of customers in my region	Improves the relationship between customers and the firm.
Manufacturing	Websites, Twitter, LinkedIn	Customer Attraction	Öztamur & Karakadılar, (2014), Gao & Lee, (2017), Kim et al., (2015)	Social media helps to send our company's services to the doorsteps of the customers hence attracting more customers to patronize the services of the company	Improving markets accessibility

Industry Type	**Social Media Type**	**Constructs Measured**	**Literature Sourced**	**Summary of Respondent's Comments**	**Researchers' Comments**
Hospitality	Facebook, Twitter, Instagram	Customer Attraction	Öztamur & Karakadılar, (2014), Gao & Lee, (2017), Kim et al., (2015)	The beauty and quality of our services displayed on social media sites bring more customers	Improving creativity
Rural Banks	Websites	Communication Channel	Harrigan et al., (2018), Asiedu, (2017), Öztamur & Karakadılar, (2014)	Social media enable effective and real-time communication with clients, ability to engage multiple customers at the same time	Increased customer base and resolved customers' challenges within a short time, and gathering feedback from customers
Manufacturing	Websites, Twitter, LinkedIn	Communication Channel	Hutchins, (2016), Talal et al., (2018)	Social media gives us opportunities to disseminate information easily to our customers in different forms like texts, and audio-visuals faster to share information and receive feedback	Builds corporate brand and satisfaction
Hospitality	Facebook, Twitter, Instagram	Communication Channel	Barnett et al., (2020), Talal et al., (2018), Kaplan, (2012), Talal et al., (2018)	Responses to interested customers within the shortest possible time	Improving customer satisfaction
Rural Banks	Websites	Financial Performance	Nisar et al., (2020), Wardati & Er, (2019), Salikin et al., (2014)	This is certainly an obvious area that cannot be overlooked. Social media as an advertising tool have helped to improve our guest turnover and subsequently increased profitability	Increasing the income of the firm

Industry Type	Social Media Type	Constructs Measured	Literature Sourced	Summary of Respondent's Comments	Researchers' Comments
Manufacturing	Websites, Twitter, LinkedIn	Financial Performance	Kietzmann et al., (2011), Rauniar et al., (2014)	This presents lower costs of advertisement as compared with traditional media which eventually increases sales hence profitability	Support sales
Hospitality	Facebook, Twitter, Instagram	Financial Performance	Rajnoha & Lorincova, (2015), Apenteng et al., (2020	Social media advertising has helped to improve my guest turnover and subsequently increased my profitability	Reducing costs on advertising and improving sales
Rural Banks	Websites	Business Marketing Strategy	Majchrzak et al., (2013), Madrid-Guijarro et al., (2009)	Advertising on social media is far cheaper compared to the orthodox advertising platforms like radio and print media	Social media help to monitor competitors and look for new opportunities
Manufacturing	Websites, Twitter, LinkedIn	Business Marketing Strategy	Scuotto et al., (2017), Kietzmann et al., (2011)	We can analyze social media easily by focusing on the messages of the customers. This allows us to tailor our services for specific markets	Help in interactions and aid in networking
Hospitality	Facebook, Twitter, Instagram	Business Marketing Strategy	Majchrzak et al., (2013), Scuotto et al., (2017)	Social media has helped to position our business in the target markets and assisted us to be on top of the niche market too.	Aid in innovations and effective marketing

Sources: Field Data, August 2020

5. Study Implications

The study has both theoretical and practical implications. The study would categorically increase the level of knowledge on Small and medium enterprises (SMEs) adoption of social media for various purposes as a strategic tool that will adequately enhance their business advertisements and operations. The researchers also came out with a proposed conceptual framework model that could be tested quantitatively in a further study by both developed and developing countries. The study would also offer much understanding in the literature on how social media have been well accepted in the context of developing countries for business strategic purposes.

To the industry, this paper would also help small and medium enterprise managers and practitioners in most developing countries like Ghana to welcome social media usage as a strategic advertising tool. Furthermore, this research will serve as a catalyst to enable practitioners to make sound policies and strategies that could attract both experienced and new customers by using social media as an advertising tool towards their sustainability. Finally, the study would help SMEs to fully integrate social media for their advertising purposes for their effectiveness and efficiency especially, their sustainability.

6. Conclusion

It is worth noting that the contributions of Small and medium enterprises towards developing countries are of great significance in terms of job creation, contribution to Gross Domestic Products (GDP), rising standard of living, among others. The interview conducted among some selected small and medium enterprises managers/owners proves that social media have been a tremendous tool that have improved businesses and operations in the line of advertisements. The interview conducted also shows that the long-awaited challenge of small and medium enterprises (SMEs) on the current or modern tool for advertising has been met through social media, on platforms such as Facebook, Twitter, Instagram, websites, Google+. The results admonished that social media would help small and medium enterprises to reach most of their customers within the shortest possible time and receive feedback from them as compared with the traditional way of advertisements like radio and TV. In addition to that, the theoretical or conceptual framework shown in figure 1 also gives much understanding to SMEs regarding the key position of social media. Therefore, the interviews conducted showed that social media are effective, that theywill help SMEs towards their sustainability based on the numerous functions that their networks offer.

Similarly, the interview conducted shows that the various constructs that are customer attraction, communication channel, financial performance, and business marketing strategy are easily achievable in the marketplace due to their sustainability through social media. Ironically, Small and medium enterprises can therefore rely strongly on social media for their advertising purposes since the interview conducted produced a positive result from the data or information

gathered. Therefore, social media as a strategic advertising tool will help small and medium enterprises to achieve customer attractions since more customers through smartphones are on social media, improve theircommunication, advance their business marketing strategy, enlarge their financial performance, and conceive more ideas. The usage of social media by SMEs has been very instrumental since the old way of advertisement is becoming obsolete and needs a replacer. This study, thus, provides enough information or evidence through the interview conducted on benefits that social media can offer to SMEs for their sustainability as a strategic advertising tool. Moreover, the effectiveness of social media as a strategic tool would enable small and medium enterprises to achieve sustainability and strengthening them to enhance their advertisements.

Limitation

This paper has the limitation of solely adopting interview as a methodology. There is a lack of other forms of methodology approaches that might provide some level of information or results that could have been beneficial for the study. Hence, a quantitative inquiry would be welcome by future researchers with regards to the current study theme.

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References

[1] Ainin, S., Parveen, F., & Moghavvemi, S. (2015). *Factors influencing the use of social media by SMEs and its performance outcomes*. https://doi.org/10.1108/IMDS-07-2014-0205.

[2] Almeida, F., & Santos, J. D. (2020). The Role of Social Networks in the Internationalisation of Startups: LinkedIn in Portuguese Context. *Management & Marketing. Challenges for the Knowledge Society*, 15(3), pp. 345-363.

[3] Apenteng, B. A., Ekpo, I. B., Mutiso, F. M., Akowuah, E. A., & Opoku, S. T. (2020). Examining the relationship between social media engagement and hospital revenue. *Health Marketing Quarterly*, 37(1), pp. 10-21. https://doi.org/10.1080/07359683.2020.1713575

[4] Asiedu, F. O. (2017). Social Media Advertising and Consumer Decision making in the Fashion Industry, *University of Ghana Digital Collection*, http://ugspace.ug.edu.gh (june).

[5] Bacik, R., Fedorko, R., Nastisin, L., & Gavurova, B. (2018). Factors of communication mix on social media and their role in forming customer experience and brand

image. *Management & Marketing. Challenges for the Knowledge Society*, 13(3), pp. 1108-1118.

[6] Barnett, J., Vasileiou, K., & Lucas, J. S. (2020). Conversations about food allergy risk with restaurant staff when eating out: A customer perspective. *Food Control*, *108* (June 2019), 106858. https://doi.org/10.1016/j.foodcont.2019.106858.

[7] Bianchi, C., & Andrews, L. (2015). Investigating marketing managers' perspectives on social media in Chile. *Journal of Business Research*, 68(12), pp. 2552-2559. https://doi.org/10.1016/j.jbusres.2015.06.026.

[8] Botchway, R. K., Jibril, A. B., Kwarteng, M. A., Chovancova, M., & Oplatková, Z. K. (2019). A review of social media posts from UniCredit bank in Europe: a sentiment analysis approach. *Proceedings of the 3rd International Conference on Business and Information Management*, pp. 74-79. ACM.

[9] Dincă, V. M., Dima, A. M., & Rozsa, Z. (2019). Determinants of cloud computing adoption by Romanian SMEs in the digital economy. *Journal of Business Economics and Management*, 20(4), pp. 798-820.

[10] Elghannam, A., Mesias, F. J., Escribano, M., Fouad, L., Horrillo, A., & Escribano, A. J. (2020). Consumers' perspectives on alternative short food supply chains based on social media: A focus group study in Spain. *Foods*, 9(1). https://doi.org/10.3390/ foods9010022.

[11] Gamboa, A. M., & Gonçalves, H. M. (2014). Customer loyalty through social networks: Lessons from Zara on Facebook. *Business Horizons*, 57(6), pp. 709-717. https://doi.org/ 10.1016/j.bushor.2014.07.003.

[12] Gao, X., & Lee, J. (2017). E-government services and social media adoption: Experience of small local governments in Nebraska state. *Government Information Quarterly*, 34(4), pp. 627-634. https://doi.org/10.1016/j.giq.2017.09.005.

[13] Georgi, D., & Mink, M. (2013). Journal of Retailing and Consumer Services eCCIq : The quality of electronic customer-to-customer interaction. *Journal of Retailing and Consumer Services*, 20(1), pp. 11-19. https://doi.org/10.1016/j.jretconser.2012.08.002.

[14] Gligor, D., & Bozkurt, S. (2020). FsQCA versus regression: The context of customer engagement. *Journal of Retailing and Consumer Services*, 52 (March 2019), 101929. https://doi.org/10.1016/j.jretconser.2019.101929.

[15] Guo, L., Gruen, T. W., & Tang, C. (2017). Seeing relationships through the lens of psychological contracts: the structure of consumer service relationships. *Journal of the Academy of Marketing Science*, 45(3), pp. 357-376. https://doi.org/10.1007/s11747-015-0462-5.

[16] Harrigan, P., Evers, U., Miles, M. P., & Daly, T. (2018). Customer engagement and the relationship between involvement, engagement, self-brand connection and brand usage intent. *Journal of Business Research*, *88*(November), pp. 388-396. https://doi.org/ 10.1016/j.jbusres.2017.11.046.

[17] Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. *Journal of Interactive Marketing*, 28 (2), pp. 149-165. https://doi.org/10.1016/j.intmar.2013. 12.002.

[18] Hutchins, A. L. (2016). *Beyond resumes : LinkedIn for marketing educators*. 10 (2), pp. 137-147. https://doi.org/10.1108/JRIM-12-2015-0099.

[19] Jibril, A. B., Kwarteng, M. A., Chovancova, M., & Pilik, M. (2019). The impact of social media on consumer-brand loyalty: A mediating role of online based-brand community. *Cogent Business & Management*, 6(1), 1673640.

[20] Jibril, A. B., Kwarteng, M. A., Chovancova, M., & Vykydalova, N. (2019). The role of the social media brand community on consumers' purchasing attitude. *ECSM 2019 6th European Conference on Social Media*, 135. Academic Conferences and publishing limited.

[21] Kaplan, A. M. (2012). If you love something, let it go mobile: Mobile marketing and mobile social media 4x4. *Business Horizons*, 55(2), pp. 129-139. https://doi.org/10.1016/j.bushor.2011.10.009.

[22] Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1), pp. 59-68.

[23] Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons*, 54(3), pp. 241-251. https://doi.org/10.1016/j.bushor.2011.01.005.

[24] Kim, W. G., Lim, H., & Brymer, R. A. (2015). The effectiveness of managing social media on hotel performance. *International Journal of Hospitality Management*, 44, pp. 165-171. https://doi.org/10.1016/j.ijhm.2014.10.014.

[25] Kumar, R. (2017). Targeted SME Financing and Employment Effects. *Targeted SME Financing and Employment Effects*, (3). https://doi.org/10.1596/27477.

[26] Kwaku Amoah, S. (2018). The Role of Small and Medium Enterprises (SMEs) to Employment in Ghana. *International Journal of Business and Economics Research*, 7(5), 151. https://doi.org/10.11648/j.ijber.20180705.14.

[27] Kwarteng, M. A., Jibril, A. B., Nwaiwu, F., Pilík, M., & Chovancova, M. (2020). The prospects of Internet-Based Channel Orientation for the competitiveness of service companies on the domestic market. *International Journal of Information Management*, 102223.

[28] Lee, I. (2017). Big data: Dimensions, evolution, impacts, and challenges. *Business Horizons*, 60(3), pp. 293-303. https://doi.org/10.1016/j.bushor.2017.01.004.

[29] Madrid-Guijarro, A., Garcia, D., & Van Auken, H. (2009). Barriers to innovation among spanish manufacturing SMEs. *Journal of Small Business Management*, 47(4), pp. 465-488. https://doi.org/10.1111/j.1540-627X.2009.00279.x.

[30] Majchrzak, A., Faraj, S., Kane, G. C., & Azad, B. (2013). The contradictory influence of social media affordances on online communal knowledge sharing. *Journal of Computer-Mediated Communication*, 19(1), pp. 38-55. https://doi.org/10.1111/jcc4.12030.

[31] Malthouse, E. C., Calder, B. J., Kim, S. J., Vandenbosch, M., Malthouse, E. C., Calder, B. J., Vandenbosch, M. (2016). Evidence that user-generated content that produces engagement increases purchase behaviours, *Journal of Marketing Management*, 32(5-6), pp. 427-444, DOI: 10.1080/0267257X.2016.1148066.

[32] Mangold, W. G., & Faulds, D. J. (2009). *Social media : The new hybrid element of the promotion mix*. https://doi.org/10.1016/j.bushor.2009.03.002.

[33] Media, S., & Force, B. D. (2017). www.econstor.eu.

[34] Nasir, S. (2015). Customer relationship management strategies in the digital era. In *Customer Relationship Management Strategies in the Digital Era*. https://doi.org/

10.4018/978-1-4666-8231-3.

[35] Nisar, T. M., Prabhakar, G., Ilavarasan, P. V., & Baabdullah, A. M. (2020). Up the ante: Electronic word of mouth and its effects on firm reputation and performance. *Journal of Retailing and Consumer Services*, 53 (September 2018), 101726. https://doi.org/10.1016/j.jretconser.2018.12.010.

[36] Odupitan, A. T. (2017). *Understanding The Distribution Channels of Fast Moving Consumable Goods (FMCG) of Food Industry In Nigeria*.

[37] Öztamur, D., & Karakadılar, İ. S. (2014). Exploring the Role of Social Media for SMEs: As a New Marketing Strategy Tool for the Firm Performance Perspective. *Procedia - Social and Behavioral Sciences*, 150, pp. 511-520. https://doi.org/10.1016/j.sbspro.2014.09.067.

[38] Rajnoha, R., & Lorincova, S. (2015). Strategic Management of Business Performance Based on Innovations and Information Support in Specific Conditions of Slovakia. *Journal of Competitiveness*, 7(1), pp. 3-21. https://doi.org/10.7441/joc.2015.01.01.

[39] Rauniar, R., Rawski, G., Yang, J., & Johnson, B. (2014). Technology acceptance model (TAM) and social media usage: An empirical study on Facebook. *Journal of Enterprise Information Management*, 27(1), pp. 6-30. https://doi.org/10.1108/JEIM-04-2012-0011.

[40] Sabate, F., Berbegal-Mirabent, J., Cañabate, A., & Lebherz, P. R. (2014). Factors influencing popularity of branded content in Facebook fan pages. *European Management Journal*, 32(6), pp. 1001-1011. https://doi.org/10.1016/j.emj.2014.05.001.

[41] Salikin, N., Wahab, N. A., & Muhammad, I. (2014). Strengths and Weaknesses among Malaysian SMEs: Financial Management Perspectives. *Procedia - Social and Behavioral Sciences*, 129, pp. 334-340. https://doi.org/10.1016/j.sbspro.2014.03.685.

[42] Scuotto, V., Del Giudice, M., della Peruta, M. R., & Tarba, S. (2017). The performance implications of leveraging internal innovation through social media networks: An empirical verification of the smart fashion industry. *Technological Forecasting and Social Change*, 120, pp. 184-194. https://doi.org/10.1016/j.techfore.2017.03.021.

[43] Seiler, A., Papanagnou, C., & Scarf, P. (2020). On the relationship between financial performance and position of businesses in supply chain networks. *International Journal of Production Economics*, 227, 107690. https://doi.org/10.1016/j.ijpe.2020.107690.

[44] Smith, B. G., & Gallicano, T. D. (2015). Terms of engagement: Analyzing public engagement with organizations through social media. *Computers in Human Behavior*, 53, pp. 82-90. https://doi.org/10.1016/j.chb.2015.05.060.

[45] Talal, A. M., Natalia, V., & (Catherine), J. T.-M. (2018). Marketing effectiveness of hotel Twitter accounts: the case of Saudi Arabia. *Journal of Hospitality and Tourism Technology*, 9(1), pp. 65-79. https://doi.org/10.1108/JHTT-09-2017-0096.

[46] Tambovceva, T., Atstaja, D., Tereshina, M., Uvarova, I., & Livina, A. (2020). Sustainability challenges and drivers of cross-border greenway tourism in rural areas. *Sustainability (Switzerland)*, 12(15). https://doi.org/10.3390/SU12155927.

[47] Wardati, N. K., & Er, M. (2019). The impact of social media usage on the sales process in small and medium enterprises (SMEs): A systematic literature review. *Procedia Computer Science*, 161, pp. 976-983. https://doi.org/10.1016/j.procs.2019.11.207.

[48] Zhang, L., & Pentina, I. (2012). Motivations and usage patterns of weibo. *Cyberpsychology, Behavior, and Social Networking*, 15(6), pp. 312-317. https://doi.org/10.1089/cyber.2011.0615.

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Towards Sustainable Development in the European Labour Market by Suppressing Corruption

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Abstract

The 2030 Agenda for Sustainable Development adopted by the United Nations includes one specific goal referring to decent work and economic growth, more specifically: the eighth goal. Among others, this goal calls for opportunities for full employment and decent work for everyone, promotion of equal labour rights and eradicating discrimination. Considering the need to pursue this sustainable development goal, the progress made towards this regard can be measured using the following indicator: young people neither in employment nor in education and training. Given that corruption negatively affects schooling years and causes difficulties in the labour market, the main objective of this research paper is to quantify the impact that the corruption perception index has on achieving the eighth sustainable development goal in the European Union, more specifically on the indicator that measures the progress made in this regard: the share of young people aged 15-29 who are not in the education system and who are unemployed out of all the young people aged 15-29. In this study, the previously mentioned indicator represents the dependent variable in the designed econometric model, based on cross-sectional data, while the corruption perception index represents the independent indicator. The main findings of this research include: taking 2019 as the reference year at the level of all the 28 states of the European Union, young women encounter difficulties in finding a job or remaining in the education system due to corruption (57.53%), while young men (18.87%) do not encounter difficulties in this respect as much as women do. In order to combat gender discrimination and to ensure progress towards the eighth sustainable development goal, the European Union should fight corruption by establishing e-government solutions, fostering international cooperation, improving transparency in the fight against corruption and strengthening the civil society engagement in the field of corruption suppression.

Keywords: sustainable development, corruption, European labour market, gender discrimination

JEL Classification: J16, J71, C21, C87

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1. Introduction

Corruption represents a complex issue, being present in almost all sectors and causing serious damage to the individual, the economy, as well as to humanity as a whole (Frolova et al., 2019). Corruption poses a threat to all the countries around the world, since it contributes to governmental instability, it erodes trust and threatens the economy by undermining fair competition and, even worse, it discourages investments and trade (Rose-Ackerman and Palifka, 2016). Owusu, Chan and Hosseini (2019) consider that the lack of knowledge and political barriers have a strong impact on the administrative anti-corruption measures.

2. Problem Statement

Rose-Ackerman and Søreide (2011) demonstrated the importance of studying corruption and corruption perceptions in conjunction with sustainable development, claiming that corruption has the potential to undermine sustainable development in many ways. It has been demonstrated that high-income countries are more strongly and negatively affected by the corruption phenomenon than low-income countries, as far as the sustainable development goals and the economy are concerned (Hoinaru et al., 2020). Sustainable development can be improved through various methods, including: fostering digitization via increasing tax compliance (Fanea-Ivanovici et al., 2019); consolidating er people's and especially the entrepreneurs' trust in public officials and in the business legislation (Popescu, Davidescu and Huidumac, 2018). Unfortunately, corruption is correlated with employment in the sense that high levels of corruption imply high levels of unemployment (Beltrán, 2015). Youth unemployment is considered to be specific to countries with high public debt, as a consequence of corruption (Tomić, 2018).

The United Nations (2015) claims that the 2030 Agenda for Sustainable Development represents an action plan that seeks to strengthen universal peace and eradicate poverty in all its forms. The 8th goal on the 2030 Agenda for Sustainable Development is called "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" and, among others, it refers to achieving full employment and decent work for all women and men, including for young people and persons with disabilities, along with equal pay for work of equal value. Moreover, this objective also mentions the need to substantially reduce the proportion of youth not in employment, education or training. Considering this context, an emerging issue in the field of sustainable development refers to the impact of corruption and corruption perceptions on achieving sustainable development.

The novelty factor of this research paper is ensured by the fact that a quantitative research method was used in order to study the implications of corruption on specific indicators, which measure the progress made towards a more sustainable future in the European Union, according to principles within the 2030 Agenda for Sustainable Development.

3. Research Questions/Aims of the research

Each state of the European Union must contribute and quantify its effort made towards meeting specific values of SDGs indicators, as described in the 2030 Agenda for Sustainable Development (Firoiu, 2019).

In this case, the research questions are the following: Is the perception of corruption correlated with unemployment in the European Union, from the perspective of a sustainable development indicator that quantifies the progress made in this direction: "young people neither in employment nor in education and training" (abbreviated: SDG_08_20)? Is the corruption perceptions index able to successfully predict young people neither in employment nor in education and training, in the case of the European Union members?

The objective of this research paper is to quantify the impact of the corruption perceptions index on the young people neither in employment nor in education and training, filtered by gender, at European Union level, in 2019.

Considering the literature review, the hypothesis is that SDG_08_20 is positively correlated with the corruption perceptions index in 2019, when analysing the indicators for the 28 European Union members.

4. Research Methods

The statistical data used in this research were obtained from two database sources: Eurostat and Transparency International. The indicators analysed in this paper are the following: SDG_08_20: young people neither in employment nor in education and training, per gender (Eurostat, 2020) and the corruption perceptions index (Transparency International, 2020). The data were downloaded from the official databases in May 2020 and later processed, based on the EViews requirements. EViews is a software that provides access to powerful statistical, forecasting, and modelling tools.

SDG_08_20 represents one of the key indicators that quantify the progress made towards achieving the 8th sustainable development goal (European Commission, 2020). The corruption perceptions index scores countries and territories based on the degree of corruption of a country's public sector, as perceived by experts and business executives. Transparency International defines this indicator as a composite index, based on a combination of 13 surveys and assessments of corruption, collected by a variety of reputable institutions.

The research method is quantitative − linear regression with cross-sectional data. This type of method specific to econometrics (Frees, 1995) facilitates the study of multiple observations (in this case: all the European Union Member States) at a certain moment in time (in this case: the year 2019), focusing on a single phenomenon (each indicator included in the study). In the designed econometric models (split per gender), the corruption perceptions index (abbreviated: IPC) represents the independent/exogenous variable, while SDG_08_20 represents the dependent/endogenous variable (Arellano, 2003). Based on gender, SDG_08_20 is split in: SDG_08_20_F♀ (meaning young women

neither in employment nor in education and training) and SDG_08_20_M♂ (representing young men neither in employment nor in education and training).

5. Findings

The descriptive statistics analysis of the two indicators (three if we consider the split by gender) included in the designed econometric models allow us to point out certain characteristics of the European Union members.

Table 1. Descriptive statistics regarding the analysed indicators at European Union level (based on cross-sectional data), reference year – 2019

	IPC	SDG_08_20_F♀	SDG_08_20_M♂
Mean	64.3214	13.5107	9.6964
Median	61.0000	12.8000	9.6000
Maximum	87.0000	24.3000	20.2000
Minimum	43.0000	5.8000	4.0000
Standard Deviation	14.1606	4.8324	3.6237
Skewness	0.1033	0.379	0.8937
Kurtosis	1.6826	2.4409	3.8517
Jarque–Bera	2.0743	1.0349	4.5742
Observations	28	28	28

Source: own conceptualization in EViews

In 2019, in the 28 EU Member States, the IPC average was 64.3214, with a standard or deviation of 14.1606 (22% of the mean), which indicates that the EU members are characterized by the existence of corruption, or at least there is the perception that corruption exists. The average of SDG_08_20_F♀ is 13.51%; with a standard deviation from this value of 4.83 percentage points (i.e. 36% of the mean). This is important when compared to SDG_08_20_B♂, considering that the SDG_08_20_F♀ average is with is by 3.82 percentage points greater than that of SDG_08_20_B♂, which indicates that young women encounter more difficulties than young men in terms of getting a job or finding training.

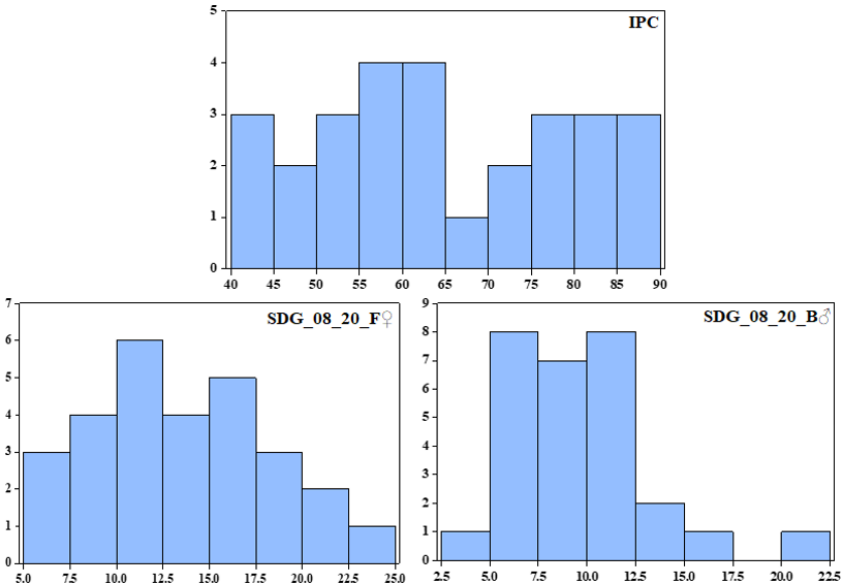

Figure 1. The histograms of the analyzed indicators (reference year: 2019)
Source: own conceptualization in EViews

The IPC distribution is normal, considering the Skewness value of 0.1033 and that the value of an ideal distribution should be as close as possible to zero (Startz, 2019). This observation is important because it demonstrates that, at the level of the 28 EU Member States, corruption is highly perceived in some of them and slightly in others. The IPC values range from 0 to 100, where 0 represents the highest level of corruption perception and 100 represents a level with no corruption perceived.

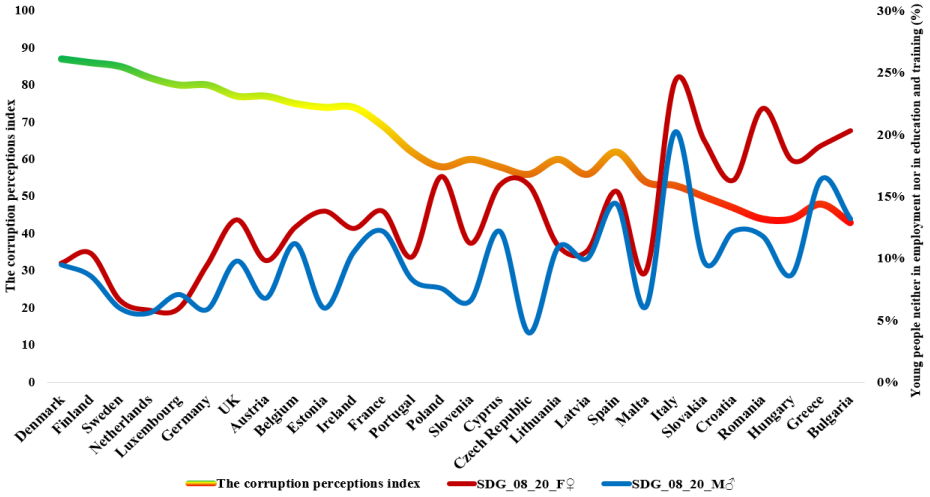

Figure 2. The corruption perceptions index and SDG_08_20 in all the European Union Members States
Source: own conceptualization

In terms of the Skewness value, SDG_08_20_F♀ is closer to normal distribution than SDG_08_20_B♂ (0.379 vs 0.8937), in which case the distribution has a long right tail. Kurtosis measures the peakedness or flatness of the distribution and has an associated value of three in the case of a normal distribution. From this perspective, IPC is highly platykurtic (distribution is flat) due to the 1.6826 value, which indicates that there are not that many EU members with IPC values around the mean of 64.3214. SDG_08_20_F♀ is closer to a normal distribution in terms of Kurtosis (2.4409), while SDG_08_20_B♂ (3.8517) is slightly leptokurtic (distribution is peaked). This comparison regarding the Kurtosis value split per gender highlights the fact that, in the European Union, in 2019, young men are less likely to encounter issues in finding jobs or training / education, compared to young women.

In order to respond to the research questions, two econometric models were designed, based on the cross-sectional data; the method used being that of the linear regression, least squares. The models are split per gender.

Table 2. The parameters of the econometric models and their equations

Formula of the method
LS SDG_08_20_F♀ C IPC LS SDG_08_20_B♂ C IPC
Formula of the equation of the model
SDG_08_20_F♀ = C(1) + C(2) × IPC SDG_08_20_B♂ = C(1) + C(2) × IPC
Equation of the model and coefficients obtained
SDG_08_20_F♀ = 30.16096 - 0.258860 × IPC SDG_08_20_B♂ = 16.84801 - 0.111185 × IPC

	SDG_08_20_F♀	**SDG_08_20_M♂**
R^2	0.5753	0.1887
Adjusted R^2	0.559	0.1575
S.E. of regression	3.2089	3.326
Sum squared resid	267.7353	287.6198
Log likelihood	-71.3394	-72.3423
F–statistic	35.231	6.0502
Prob (F–statistic)	0.0000	0.0208
Mean dependent var	13.5107	9.6964
S.D. dependent var	4.8324	3.6237
Akaike info criterion	5.2385	5.3101
Schwarz criterion	5.3336	5.4053
Hannan–Quinn criter.	5.2676	5.3392
Durbin–Watson stat	2.2999	2.777

Source: own conceptualization in EViews

The t-student values of the parameters are important, considering that if the probabilities associated to those are less than 0.05, the null hypotheses are rejected (the parameters of the variables differ significantly from 0). In these econometric models, the corresponding probabilities are below 0.05, so that the null hypotheses are rejected and the alternative hypotheses are accepted. The coefficients differ significantly from 0, which validates the designed models.

The coefficient of determination has acceptable values, but only in the case of one model out of two. In 2019, in the European Union, the percentage of young women neither in employment nor in education and training out of the total young women is explained in a proportion of 57.53% by the exogenous variable (the corruption perceptions index). In order to counter the mechanical increase of the coefficient of determination in case more variables were introduced in this econometric model, the Adjusted R^2 indicator confirms its validity, due to the 55.90% value, which is similar to the coefficient of determination (57.53%). Unlike the situation of young women, the corruption perceptions index cannot successfully predict the percentage of young men neither in employment nor in education and training out of the total young men, due to the low value of the coefficient of determination (R^2): 18.87%.

At the same time, the first model passes the error autocorrection test, according to the Durbin–Watson indicator, which identifies the correlation between the errors of the model. A value of two indicates that the errors are not correlated and that the model would be valid (in our case, the value is 2.29).

Based on the processed data, taking 2019 as the reference year and taking all the 28 EU Member States into consideration, any IPC score of 70 (favourable situation, indicating a good score of corruption perceptions) implies a value of 12.05% associated to SDG_08_20_F♀ (calculated as follows: 30.1609 + (-0.2588 × 70)). Should IPC be smaller than 70 (unfavourable situation, marking a high perception of corruption), 40 for example, then SDG_08_20_F♀ increases from 12.05 to 19.81% (calculated as follows: 30.1609 + (-0.2588 × 40)). This evidence proves that if corruption is highly perceived (which means small values in terms of IPC), then the percentage of young women neither in employment nor in education and training out of the total young women is greater compared to that of a EU country where corruption is not perceived as much (large values when quantified by the IPC).

Table 3. The White Test for Homoscedasticity of the Residuals

Test for Homoscedasticity of the Residuals			
F–statistic	0.9795	Prob. F (2,25)	0.3894
Obs × R^2	2.0347	Prob. χ^2 (2)	0.3615
Scaled explained SS	2.0322	Prob. χ^2 (2)	0.3620

Source: own conceptualization in EViews

The testing of the model continued with the White test performed on the residuals of the cross-sectional linear regression model, specific to young women. This test confirmed the desirable homoskedastic character (errors have a constant dispersion) induced by the F-statistic 0.9795 and Prob.F 0.3894 (greater than the 0.05 value, which is required in order to accept homoscedasticity). The median of the residuals is zero, which also proves the validity of the model.

6. Conclusions

Corruption limits the progress made towards sustainable development. Judging from the perspective of the European Labour Market, corruption in the European Union has direct implications on the unemployment rate.

The 8th goal on the 2030 Agenda for Sustainable Development is endangered by corruption. Achieving full employment and decent work for all women and men, including for young people and persons with disabilities, along with equal pay for work of equal value represent aims that can be achieved by suppressing corruption. In order to substantially reduce the proportion of youth not in employment, education or training, the European Union must actively fight corruption and ensure the necessary levers for the civil society to report any act or intentions of corruption.

The objective of this research paper is met and the hypothesis is partially validated. In 2019, when analysing the indicators in the case of the 28 EU Member States, the percentage of young women neither in employment nor in education and training out of the total young women is positively correlated with the corruption perceptions index. If corruption is perceived as high in any of the analysed countries, then the percentage of young women neither in employment nor in education / training out of the total young women is bigger compared to that of a EU Member State where corruption is not perceived as much.

The main limitation of this research is represented by the cross-section character of the analysed data. The point of reference used in this research is the year 2019. Similarly, this research can be extended by analysing other geographical locations besides Europe (in particular, the European Union in this paper). Moreover, the econometric models can be upgraded by including more indicators specific to the 2030 sustainable development goals.

With the intention of combating gender discrimination and ensuring that progress is made towards achieving the eighth sustainable development goal, the European Union can fight corruption by establishing e-government solutions, fostering international cooperation, improving transparency in the fight against corruption and by strengthening the civil society engagement in the field of corruption suppression.

References

[1] Arellano, M. (2003). *Panel Data Econometrics*. Oxford University Press.

[2] Beltrán, A. (2015). Does corruption increase or decrease employment in firms?. *Applied Economics Letters*, 23(5), pp. 361-364.

[3] European Commission (2020). *Result of the review in preparation of the 2020 edition of the EU SDG monitoring report*.

[4] Eurostat (2020). *Sustainable Development Goals (SDG) Indicators: Goal by Goal*.

[5] Fanea-Ivanovici, M., Muşetescu, R.-C., Pană, M.-C., and Voicu, C. (2019). Fighting Corruption and Enhancing Tax Compliance through Digitization: Achieving Sustainable Development in Romania. *Sustainability*, 11(5).

[6] Firoiu, D., Ionescu, G. H., Băndoi, A., Florea, N. M., and Jianu, E. (2019). Achieving Sustainable Development Goals (SDG): Implementation of the 2030 Agenda in Romania. *Sustainability*, 11(7).

[7] Frees, E. W. (1995). Assessing cross-sectional correlation in panel data. *Journal of Econometrics*, 69(2), pp. 393-414.

[8] Frolova, I. I., Voronkova, O. Y., Alekhina, N., Kovaleva, I., Prodanova, N. A., and Kashirskaya, L. V. (2019). Corruption as an obstacle to sustainable development: A regional example. *Entrepreneurship and Sustainability Issues*, 7(1), pp. 674-689.

[9] Hoinaru, R., Buda, D., Borlea, S. N., Văidean, V. L., and Achim, M. V. (2020). The Impact of Corruption and Shadow Economy on the Economic and Sustainable Development. Do They "Sand the Wheels" or "Grease the Wheels"?. *Sustainability*, 12(2).

[10] Owusu, E. K., Chan, A. P. C., and Hosseini, M. R. (2019). Impacts of anti-corruption barriers on the efficacy of anti-corruption measures in infrastructure projects: Implications for sustainable development. *Journal of Cleaner Production*.

[11] Popescu, G., Davidescu, A., and Huidumac, C. (2018). Researching the Main Causes of the Romanian Shadow Economy at the Micro and Macro Levels: Implications for Sustainable Development. *Sustainability*, 10(10).

[12] Rose-Ackerman, S., and Palifka, B. J. (2016). *Corruption and Government: Causes, Consequences, and Reform*. Cambridge University Press.

[13] Rose-Ackerman, S., and Søreide, T. (2011). *International Handbook on the Economics of Corruption*. Edward Elgar Publishing.

[14] Startz, R. (2019). *EViews Illustrated*. University of California, Santa Barbara.

[15] Tomić, I. (2018). What drives youth unemployment in Europe? Economic versus non-economic determinants. *International Labour Review*, 157(3), pp. 379-408.

[16] Transparency International (2020). *Corruption Perceptions Index Database*.

[17] United Nations (2015). *Transforming our World: the 2030 Agenda for Sustainable Development.*

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Study on the Evolution of the Milk Market in Romania

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Abstract

The last decade has been marked by a considerable increase in demand for dairy products on the Romanian market due to the modernization and development of the agricultural sector.

In the context of increasing the competitiveness of domestic producers towards foreign ones, it is necessary to analyse the evolution of the milk market and to perform an X-ray of the current situation in Romania, concreted by a SWOT analysis based on the indicators of performance of the milk chain.

This article aims to determine weaknesses, to identify ways and possibilities of expanding the Romanian milk market in terms of both production and income, using data provided by National Institute of Statistics and TRADE MAP and to offer a complete picture of the Romanian milk market potential.

Keywords: milk market, consumption, dairy products, production, trade balance.

JEL Classification: Q11

1. Introduction

Romania is the eighth largest country in the European Union in terms of the number of cows for milk, with about 1.16 million animals in 2018, according to Eurostat, but with the lowest yield in the Union, according to data published by the European Commission.

This is the consequence of the fact that the majority of dairy cows are on farms without legal personality, the most widespread being individual households.

The quantities of milk collected from agricultural holdings and collection centres by processing units in Romania increased by about 7% between January and April 2019 compared to the same period in the previous year. (Beciu, 2010)

In May 2019, the quantity of cow's milk delivered to processing units in Romania increased by 13.0% compared to April 2019 and by 0.3% compared to May 2018, informs the National Statistical Institute.

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The first five months of this year, the quantities of milk collected from agricultural holdings and collection centres increased by 5.3% compared to the first five months of the previous year, according to the same source. In the same period, January – May 2019, imports of raw milk by processors amounted to 44,533 tonnes, being almost 30% lower than in the same period last year.

The average price of milk in Romania is well below the European Union average (33.8 euro/100 kg) in May 2019, being among the lowest in the Union (28.7 euro/100 kg). Only Lithuania had a lower price, i.e., 28.1 euro/100 kg. (Redactia FIR, 2019).

The quantity of raw milk imported by processing units increased by 18.206 tonnes during the period 1 January - 31 May 2020 compared to the same period in 2019. One more reason for this increase was due to the development of the organic dairy market, caused by consumer awareness of the importance of choosing healthy foods.

On the dairy market, it is necessary to raise awareness of competition among farms both at national and European level. It is important to focus on adapting to constant market changes and price fluctuations. The increased level is determined by knowledge, training, current technical facilities, farm technology and management, milk quality, economic efficiency and competitiveness. (Fedorciucova, 2016)

2. Problem Statement

The Common Market Organisation and the policy instruments for the milk and milk products sector have undergone a number of changes over the past 40 years, practically following the overall trend of the CAP, but compared to other sectors where reforms have been substantial, in this case the changes have been slower and have not targeted radical reforms.

The evolution of the global and European dairy market as well as the change in consumer preferences in the context of socio-economic development and diversification of production due to the introduction of new technologies, the influence of related sectors (beef and veal, arable crops and feed) that have undergone profound reforms of the political instrumentation in order to facilitate the connection of actors on those lines to real market signals will increasingly influence the milk production and processing sector, which are supported by policy instruments that no longer fit the current economic context. (Constantin, 2007)

Thus, the need for radical policy reform in this sector has become increasingly obvious and urgent.

At the end of 2007, the European Commission presented to the European Parliament and the Council the document entitled 'health control' of the Common Agricultural Policy. An important point in this document is the proposal to eliminate the milk quota from 2015.

The main concerns focused the possibility of concentration of milk production in areas where this activity entails lower costs and its disappearance from certain

areas (e.g. mountain areas). In order to avoid such a situation, it is necessary to create alternative policy instruments to maintain this activity in mountain areas.

Although Romania already has EU Member State status, it faces significant structural difficulties both in terms of the structure of farms in general (excessive shredding of agricultural holdings) and in terms of processing. Farmers, processors and traders must comply with EU milk quality standards and the rigours imposed by the Community acquis in the field. However, the situation of themilk production and processing sector in Romania is currently far from the model of the EU.

Milk production is one of the most important sub-branches of agriculture in Romania. Current milk consumption of about 0.7-0.8 litres per day does not meet the normal physiological requirement for the population's nutrition.

The literature presents food security scenarios for milk and milk products in the following models for the period 1989-2020:

- in the crisis scenario milk production increases but consumption is still unsatisfactory. It is noted that the consumption production model shows strong fluctuations and even decreases.
- in the pessimistic development scenario the production model has a more sustained growth, but the average consumption per capita does not increase satisfactorily and the consumption production model undergoes fluctuations, but there is an increase in 2020 compared to 1989.
- the moderate development scenario shows a sharper increase in both production and consumption The production-consumption model for this scenario has an increased level in 2020, but there are the same fluctuations in 2010 and 2015; (Bercu, 2010)
- the ideal development scenario is that with the most pronounced increases in all parameters analysed as follows: in the production model in 2020 production will increase by 65%. Consumption as an annual average per capita will also increase by more than 65%, the consumption production model has a very high level of growth in 2020, but for the years 2010 and 2015 there are decreases.
- Romanian consumers are traditionalists when it comes to consumption of milk-based products, which are the categories that register the highest incidence in consumption. We want to identify the consumption of dairy products, starting from the idea “Consumption and production is not evenly distributed, so, in general, the large urban centres have high consumption” (Turek Rahoveanu et al., 2009).

3. Research Questions/Aims of the research

Addressing a topical theme, the present paper mainly aims to analyse, at national level, the trends of the milk and milk products market in the European context and to highlight the need to adapt it to the standards.

The analysis is oriented towards clarifying the concept of the agri-food market, its peculiarities as well as the factors of influence. Aspects of supply and demand and the concepts underlying price and supply elasticity are also presented.

4. Research Methods

This research is carried out based on the literature and activities in the agri-food sector of Romania. The research methods used are: observation, inference, analysis and synthesis.

This consists of comparing official data collected from the National Institute of Statistics, INTACEN and TRADMAP on the external milk supply, supply and trade in Romania and linking the results by analysing various case studies and articles addressing the same topic.

The analysis of statistical data is used to correctly and effectively assess the current situation in Romania regarding the dairy market, highlighting the need for awareness of competition among farms both at national and European level. It is important to focus on adapting to constant market changes and price fluctuations.

5. Findings

The performance of the Romanian agricultural sector is low. The lack of competitiveness is reflected by the low level of labour productivity, low economic growth and a deficit in agri-food trade balances, as agriculture and the food industry fail to keep up with rising demand for food, being driven by rapid overall economic growth and unable to cope with foreign competition, especially in the EU.

5.1. Supply

In terms of milk production, 90% of milk producers in Romania own 1-3 cows with an average yield per cow of 3,860 litres/year, while in milk-producing countries such as Germany or France, this figure increases to 7,000 litres/cow. Out of the 5 million tonnes of milk produced in Romania, only 1.3 million tonnes meet EU quality standards.

At national level the situation is presented as follows:

Table 1. Livestock of cows, buffalo, sheep and goats at national level

Categories of animals (number)	2013	2014	2015	2016	2017	2018
Cows and buffalo	1,168,859	1,188,203	1,190,758	1,192,543	1,175,163	1,158,008
Sheep	9,135,678	9,518,225	9,809,512	9,875,483	9,981,859	10,176,400
Goats	1,312,967	1,417,176	1,440,151	1,483,146	1,503,270	1,539,317

Source: National Institute of Statistics (www.insse.ro)

According to the data processed in the table 1, it can be noticed that in general farmers focus on the growth of sheep herds, which are the most widespread in households. Thus, sheep herds exceed almost nine times goat herds nationwide. Comparing cows and buffaloes with goats, we can say that the latter are more common in people's households, being easier to maintain.

The largest number of cows and buffaloes was 1,192,543 animals in 2016, with values keeping constant. Regarding goats, they register annual increases, from 1,312,967 animals in 2013 to 1,539,317 animals in 2018. The number of sheep in the household is also increasing from one year to the next, resulting in an increase from 9,135,678 animals in 2013 to 10,176,400 animals in 2018.

Table 2. Milk production – thousand hectolitres

Milk production	2013	2014	2015	2016	2017
Cow and buffalo	38,652	40,096	38,893	38,392	37,030
Sheep and goat	6,135	6,520	6,493	6,113	6,051

Source: National Institute of Statistics (www.insse.ro)

In terms of milk production, there is a very large difference between the production of cow's milk and the production of sheep's milk and goat's milk, the difference being 1 to 5. The production of sheep and goat milk varies between 6,113 and 6,520 thousand hectolitres, and the production of cow's milk and buffalo has values between 37,030 and 40,096 thousand hectolitres.

A herd of about 1,175,168 cows and buffaloes offer a production of 3,703,000 thousand litres of milk, respectively 3.15 thousand litres of milk/cow. For a herd of 11,485,129 sheep and goats, 6,051,000 thousand litres of milk and 19000 litres of milk/goats are obtained.

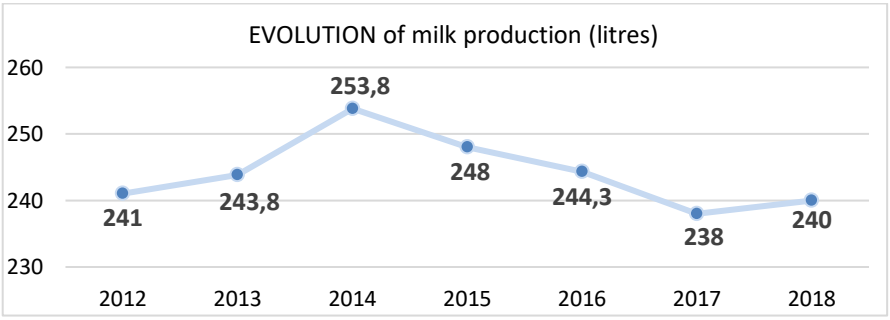

Figure 1. Romania's milk production evolution per capita
Source: adapted from National Institute of Statistics

Thus, up to 253.8 litres of milk are obtained per consumer, this maximum value being recorded in 2014, and the lowest milk production was obtained in 2012, as well as in 2018.

5.2. Demand

By definition, milk is a nutrient-rich liquid. The most commonly consumed types of milk come from cows, sheep and goats. Western countries most commonly consume cow's milk.

Milk is a rich source of protein, which is necessary for many vital functions in the body, including growth and development, cellular repair and regulation of the immune system.

Milk is considered a 'complete protein' because it contains all 9 essential amino acids needed for the body to function at an optimal level. There are two main types of protein found in milk - casein and whey protein. Both are considered high quality proteins.

Table 3. Average monthly consumption of milk and dairy products

Main consumer foods	2013	2014	2015	2016	2017	2018	2019
Milk (litres)	5.870	5.794	5.835	5.813	5.768	5.632	5.523
Cheese and sour cream (kg)	1.354	1.369	1.287	1.337	1.464	1.519	1.524
Other milk products (kg)	0.266	0.269	0.179	0.209	0.296	0.307	0.310

Source: National Institute of Statistics (www.insse.ro)

According to table 3, of the total milk production, the Romanians prefer to consume especially milk as such, less products obtained from milk. Thus, it consumes on average 5.5-5.8 litres of milk per consumer, 1.28-1.52 kg of cheese and sour cream and less than 300 g of other products obtained from milk.

Table 4. Expenses with the purchase of milk, by social categories

Main social categories	2013	2014	2015	2016	2017	2018	2019
Employees (Ron)	16.55	16.71	16.64	17.03	17.41	19.16	19.93
Farmers (Ron)	5.49	5.15	6.89	7.34	7.91	8.12	8.57

Source: National Institute of Statistics (www.insse.ro)

For the purchase of milk, the highest household expenses is for employed persons, as they purchase milk especially from supermarkets at quite high prices.

For people carrying out their activities in the agri-food field, expenditure is 3 times smaller because they do not spend money on the purchase of milk, but they produce it themselves in their own households.

Thus, if employees pay a price of about 16 lei/person/month for the purchase milk, farmers pay between 5 and 8 lei/person/month.

5.3. Foreign trade

5.3.1 Import

The latest statistics of the National Institute of Statistics show that in the first five months of the year, the import of raw milk increased by almost 41%.

Thus, in January-May 2020, the production of consumer milk increased by 12% (16,677 tonnes) to 155,766 tonnes, while processing units collected 1.9% (9,147 tonnes) less cow's milk compared to the same period the previous year, respectively 468,901 tonnes.

According to the National Institute of Statistics, there have been increases in the production within the dairy area as follows: butter by 791 tonnes (+17.5%), milk consumption by 16,677 tonnes (+12%), acidified milk (yogurt, drinking yogurt, buttermilk and other similar dairy products) by 3,205 tonnes (+3.4%) and sour cream consumption by 235 tonnes (+0.8%).).

The quantity of raw milk imported by processing units increased by 18,206 tonnes (+40.9%) during the period 1 January - 31 May 2020 compared to the same period in 2019. On the other hand, cheese production decreased by 497 tonnes (-1.2%).

Table 5. Imports of milk

Year	Imported quantity (tonnes)	Import value (euro)	Price (euro/tonne)
2015	150,938	60,275	0.39
2016	190,709	74,672	0.39
2017	207,975	97,462	0.46
2018	191,517	86,594	0.45
2019	182,587	86,587	0.47

Source: TRADEMAP – INTERNATIONAL TRADE STATISTICS (www.trademap.org)

The Romanian milk and dairy market has seen significant changes in recent years and is expected to increase in the coming period. The most important event that influences the market is Romania's integration into the European Union. In the structure of expenditure for food, milk and dairy products occupy the third position (18%) after meat and bread. With the exception of cheese, Romania is a net importer of dairy products.

The average price of milk in the European Union fell at the farm gate in January, by 0.7% compared to the previous month, to 35.34 euros/100 kg (35.34 c/kg), according to data published by the European Commission.

In Romania, the average consumer price, slightly increasing for milk and butter, remained relatively stable in February compared to January, but slightly increased compared to December 2019, by 0.56%. Cow's milk had the same development, with a stable average price in February compared to January and slightly increasing by 0.57% compared to December 2019. The price of butter increased in January, on average, by 0.94% compared to December 2019, while in February it increased by 1.4% compared to December 2019 and by 0.1% above the average level of the previous month.

5.3.2 Export

Our country imports over 8,000 tonnes of butter and 70,000 tonnes of cheese, which is why exports are insignificant.

In the first five months of this year, Romania's exports of live food and animals to the European Union (EU) decreased by 1.5% compared to the same period in 2018, while imports had an advance of 13%. In the first four months of 2019, the decrease in exports in trade relations with the EU was 4.3% compared to the same period of the previous year, while imports increased by 13.3%, according to data released by the National Institute of Statistics.

Table 6. Export of milk

Year	Exported Quantity (tonnes)	Export Value (euro)	Price (euro/tonne)
2015	33,837	18,279	0.54
2016	47,152	22,622	0.48
2017	59,962	28,803	0.48
2018	70,969	35,494	0.50
2019	58,319	35,148	0.60

Source: TRADEMAP – INTERNATIONAL TRADE STATISTICS (www.trademap.org)

Between January and April 2019, Romania exported to the European Union 20 tonnes of butter, which is an increase by 19% compared to the same period the previous year, 3,494 tonnes of cheese, which is an increase of 17% compared to the same period the preavious year, 38 tonnes of milk powder, 54 tonnes of milk powder skimmed.

5.3.3 Trade Balance

The deficit of international trade in food products, particularly in relation to the European Union, has continuously deepened in recent years. The increase in demand for food products, supported by revenue increases on the one hand, and reductions in food VAT on the other hand, is largely covered by imports. The National Bank also indicates some of the reasons that maintain this situation:

excessive fragmentation of farms, continuous reduction of livestock, insufficient collection, storage and transport spaces.

Trade between Romania and EU Member States for the main dairy products is relevant because it contributes a significant share to the total trade deficit.

Table 7. Trade Balance

Year	Imp/Expo	Quantity (tonnes)	Balance	Value (euro)	Balance
2015	Import	150,938	-116,801 Unfavourable	60,275	-41,996 Unfavourable
	Export	33,837		18,279	
2016	Import	190,709	-145,557 Unfavourable	74,672	-52,050 Unfavourable
	Export	47,152		22,622	
2017	Import	207,975	-148,013 Unfavourable	97,462	-68,659 Unfavourable
	Export	59,962		28,803	
2018	Import	191,517	-120,548 Unfavourable	86,594	-51,100 Unfavourable
	Export	70,969		35,494	
2019	Import	182,587	-124,268 Unfavourable	86,587	-51,439 Unfavourable
	Export	58,319		35,148	

Source: International Trade Centre (www.intracen.org)

According to table 7, trade balance was calculated as the difference between export and import, obtaining strictly negative values, respectively a passive (deficient) balance.

In the first half of 2019, Romania exported 20 tonnes of butter to the European Union, but during the same period it imported 3,450 tonnes from EU member countries, an increase by 19% compared to the same period the previous year, and in 2018 it exported 360 tonnes of butter to EU countries and imported 8,337 tonnes from the Community area, according to data centralised by the European Commission.

In May this year, Romania's butter production decreased by 232 tonnes (-22.8%), compared to the previous month, reaching 785 tonnes and it was by 107 tonnes lower (-12.0%) than in the same month of the previous year. Cumulatively, during the first five months of this year, Romania's butter production recorded a slight increase, by 1.4%, compared to the same period in 2018, reaching 4,510 tonnes, according to data communicated by the National Institute of Statistics (INS).

Romania exported 3,494 tonnes of cheese to the Community area in the first four months of this year, representing 24,040 tonnes, an increase by 3%, and in 2018, exported 12,592 tonnes and imported 69,980 tonnes.

Between January and April 2019, Romania exported 38 tonnes of milk powder to EU member countries, a drop by 62% compared to the same period of the previous year, and imported 386 tonnes, a decrease by 35%. In 2018, it exported 408 tonnes to the Community area and imported 1,830 tonnes.

As regards skimmed milk powder, 54 tonnes were exported, a decrease by 58% compared to the same period the previous year, and 2,102 tonnes were imported, a decrease by 22%. In 2018, 314 tonnes of skimmed milk powder were exported to the Community area and 6,745 tonnes were imported.

5.4 SWOT Analysis

Strengths:

- Introducing the milk quality assurance system.
- The preponderance of private capital motivates the development of profitable activities to obtain milk production.
- Increased production of processed milk and dairy products.
- The wide range of products offered to consumers, including organic and traditional dairy products.
- Low costs of obtaining milk production

Weaknesses:

- Addiction to private milk producers.
- High level of self-consumption (40% of the total milk consumption).
- Lack of concentrated supply of milk.
- Major deficiencies in the quality of milk and milk products from certain categories of economic agents.
- The raw material, milk, which varies quantitatively from one season to another, prints this phenomenon of seasonality to the majority of companies within the line (with special reference to processing).

Opportunities:

- High potential market of about 20,000,000 people.
- The milk quota negotiated by Romania with the European Union.
- Orientation of agricultural producers towards organization in cooperatives.
- The orientation of the population's consumption towards natural, healthy, mineral-rich products, favours the consumption of milk and dairy products.
- Entering new markets especially in the post-accession period.

Threats:

- The rising cost of raw material.
- Lack of mechanisms to encourage cooperation among producers on the milk line, including facilitating market access.
- Lack of market information for milk producers.

- Massive penetration of imports of quality dairy products on the Romanian market.
- Acceptance of a poor level of quality in milk and dairy products can undermine the sector's efforts to raise milk production standards.

6. Conclusions

The concept of competition has emerged as a new paradigm in economic development.

Competitors are aware of both the limitations and challenges of global competition at a time when effective government action is limited by budgetary constraints and the private sector faces significant obstacles to competition in domestic and international markets.

Competitiveness is a company's ability to provide products and/or services that can meet the quality of local and global standards, offering competitive prices and providing high revenues for the resources used in the production process. Competitiveness is the degree to which a nation, region or city can provide a high quality of life to its inhabitants.

In terms of milk production, 90% of milk producers in Romania hold 1-3 cows with an average cow production of 3860 litres/year, while in milk-producing countries such as Germany or France, this figure increases to 7000 litres/cow. Of the 5 million tonnes of milk produced in Romania, only 1.3 million tonnes meet EU quality standards.

A herd of approximately 1,175,168 cows and buffaloes offers a production of 3,703,000 thousand litres of milk, respectively 3.15 thousand litres of milk / cow. For a herd of 11,485,129 sheep and goats, the production is6,051,000 thousand litres of milk, respectively 1.9 thousand litres of milk/goats.

Romania imported 182,587 tonnes of raw milk in the first 11 months of 2019, an increase by 5.13% compared to the same period of 2018 according to the National Institute of Statistics.

If a country exports a value greater than that imported, it has a commercial surplus or a positive trade balance and, conversely, if a country imports a value higher than that exported, has a trade deficit or a negative trade balance. Since 2016, about 60 of the 200 countries have a commercial surplus.

From the point of view of milk production, there are two types of farms: establishments producing for the delivery of milk for processing and farms producing for the direct sale of milk for consumption and for their own consumption.

In order to make this sector more efficient, specialized studies recommend the following:

• The association of producers may be a solution in the future to reduce costs;

• In the development of this segment, a decisive role will be played by the capacity to finance from sources in view of achieving rural development;

- For some manufacturers there can be a real in gain diversifying activities through specific products and adjacent concerns offered by the rural area, such as rural tourism, organic products.

References

[1] Beciu, S. & Chihaia A. (2010). *Aspects regarding the dairy products chain in Romania*. Retrieved from https://ibn.idsi.md/sites/default/files/imag_file/21-24_20.pdf

[2] Bercu, F. & Mihai M. M., Pătrașcu G. (2010). *Importance of marketing in the trade of milk and dairy products*. Retrieved from https://ibn.idsi.md/sites/default/files/imag_file/24-27_27.pdf

[3] Constantin, M. (2007). *Marketing of agri-food production* (6th Ed.). [Marketing of agri-food production]. Bucharest: Agro Tehnica.

[4] Fedorciucova, S. (2016). *Current situation of dairy industry and trade in the Republic of Moldova*. Retrieved from https://ibn.idsi.md/sites/default/files/imag_file/337-343.pdf

[5] International Trade Centre Database.

[6] National Institute of Statistics Database.

[7] Redactia FIR. (2019*). Romania, ranked eighth in the EU in dairy cows, in last place in terms of yield*. Retrieved from https://fermierinromania.ro/Romania-pe-locul-opt-in-ue-la-efectivele-de-vaci-pentru-lapte-pe-ultimul-loc-din-punctul-de-vedere-al-randamentului/.

[8] Reg. EEC 804/68.

[9] TRADEMAP – International Trade Statistics Database.

[10] Turek, R. A., & Constantin, M., Beciu, S., Zahiu, L. (2009). *Analysis of the dairy sector in Romania*. Bucharest: Ars Academica.

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The Development of Ecological Agriculture in Romania

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Abstract

Organic farming has gradually become a sector with a profound impact on the development of economy and agriculture. It is the system that supports the ecosystems, soils and human health. It focuses on ecological processes, biodiversity and cycles adapted to local conditions. In Romania, the market share for organic products grew in the past few years, due to population's growing concerns towards health; the preoccupation is to be seen in the demand for more natural products, from food industry to beauty and healthcare. This paper investigates the dynamics of organic farming in the Romanian market, its importance in a world where pollution is a global problem along with the depletion of resources, the emergence of new diseases and health problems. In the context of a global pandemic, organic products come as an alternative for a world where processed and lab-created products substitute natural food.

Keywords: ecological, agriculture, market, health problems.

JEL Classification: Q15, Q01, O13

1. Introduction

The development of organic farming is seen as an alternative and a concept that would characterize the third millennium. It is already well known the role of agriculture in the economy of a country, being considered one of the activities that can be the basis of economic development. As in any sector, the goal is to efficiently use the available resources that lead to sustainable development. Economic growth is not the only objective of the European Union's policy for agriculture, because it does not automatically represent social development and a better quality of life. The new Common Agriculture Policy directs 30% of its payments to ecological farming. The concerns are that the more industrialized is the crop to food chain, the higher are the presences of chemicals in food. In pursue of a longer shelf life and better taste, foods have been chemically enhanced to the point where artificial will cost less than natural food. Many studies have shown a

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direct connection to heart diseases and strokes, high blood pressure, high cholesterol, and other co-morbidities and poor nutrition. (Willett, 2013). The benefits of a healthy life don't come only from what is eaten but from the chemical components of a food, the complexity of micronutrients and the lack of chemical fertilizers and others could mean the difference between a healthy individual and a sick one. Overly-processed foods took over the home cooked meals, the so-called frozen and ready-to-eat food, the fast food industries and other similar products lead to a world where at least 2.8 million people die of obesity. (Obesity and overweight − World Health Organization, 2017).

2. Problem Statement

The concept of organic farming is that system that aims to supply the consumer with fresh and authentic products and at the same time protects the natural ecosystems. As Food and Agriculture Organization of the United Nations states, a healthy diet should be considered before and after the Covid-19 pandemic, as consuming healthy and natural products contributes to a better immune response. Whether it refers to organic farming, renewable or sustainable agriculture, the whole system indicates the same thing, an alternative to traditional agriculture. Newly discovered issues that are caused by the conventional agriculture have effects on plants, animals and soil quality as well (Prandecki, 2014).

The role of organic farming is to produce healthy food, more suitable for human metabolism, in full correlation with the preservation and development of the environment. One purpose is to bring to market fresh and authentic products that are made in a process designed to respect nature. Due to the lockdown, the fragility of our system was witnessed, and the most affected were the small producers. (Press release by IPES-Food, April 2020). Organic products come from a farming system which avoids the use of chemical fertilizers, pesticides; growth regulators and livestock feed additives – as BBC defines it.

3. Aims of the Research

This paper aims to show the development of Romania's ecological market, from consumer to producer in the context of increases in global sales of ecological products. Starting from the much discussed subject of artificial foods and its link to health problems, the paper questions the BIO products consumption in the context of new diseases, and highlights the main steps to be taken for having a healthier market.

4. Research Methods

This paper contains quantitative methods – Data analysis and comparison of organic agriculture for human health and protection of the environment and vice versa – conventional one. It also contains scenario analysis – starting from the current data and calculating when and how the desired results will be obtained.

Romania's status

Romania is considered, at European level, within the agricultural sector, an agricultural paradise, due to the quality of the products and the methods used to produce them. Regarding organic crops, it is said about Romania that it has a high potential and the basic reason for these claims is that no chemical fertilizers and pesticides are used in excessive quantities, which is quite important considering the fact that the methods applied lead to an easier transition to organic farming.

Currently, in Romania, intensive agriculture is practiced but, at the same time, unintentional organic farming can be found on the land that is owned by family associations or small producers. This type of unintentional organic farming is practiced by farmers who do not have the money to use chemicals and for this reason they cannot afford to apply intensive agricultural technology.

Regarding animal welfare – market expectations are that animals should be raised on farms they are fed with fresh food, they should be offered living and medical conditions with the same rigor with which they are offered to humans. So, it is based on the idea that animals also have rights which must be observed. Despite those, most of animals and animal products are obtained in such a highly industrialized sector, that in some places, animals are kept in very bad conditions, tight spaces, fed and injected with growth hormones, most of them never see the sunlight, being born and raised without being able to move (Grandin, 2000) (Oscar, 2018).

Researchers have argued that poor life conditions for animals from which we consume meat or other animal products could lead to health problems for humans, and an easier transmission of diseases form animal to human (Fallah, 2015). Wet markets as well as stressed animals kept in bad conditions are more prone to spreading diseases. This added to the trends of a bad nutrition, poverty and lack of medical services ramped up the death cases due to poor nutrition. An analysis of global deaths due to various causes showed that in 2020 most of worldwide deaths are caused by diabetes and on third place by COVID-19, an infectious respiratory disease that mixed with other co-morbidities (Barratt, 2020). In Romania, statistics showed that the first cause of death from 2007 to 2016 were the cardiovascular diseases followed by tumours and digestive diseases (Cucu, 2017).

The trends of industrialization, mechanization and globalization changed the eating habits from rich in fibre foods to consumption of foods with high caloric and lipid density; these trends, mixed with a sedentary lifestyle, caused a raise in cardiovascular diseases and type 2 diabetes. In the past years, smoking was the first known cause of cancers, now we have the dietary habits on second place as the main root causes for cancers (Graur, 2006).

Those highlights paved the way to a better nutrition and prevention, the concerns for a healthier lifestyle grew, fact that can be seen in the growth of demand for organic products, recreational activities – gym, cycling, skiing and other sports.

Consumer's level

First thing to be tackled is consumer confidence – being the most important in this chain, from marketing to sales, the attention falls on the customer and his/her needs. It is practically the end of this chain of distribution process of organic farms. If organic products were not very present 3 years ago in the market, and Romania's market was still developing, now in most of supermarkets, especially the large ones, there are special aisles for Bio products, light green shelves and tags can be seen almost everywhere. A growing trend in this area is also the growth of sustainable clothing, where big clothing manufactures are using recycled cotton and collect old clothes for the same reason. (Fletcher,2008); what can be seen on tags now are the words "from organic cotton" – as shown in figure 1 below:

Figure 1. Organic Cotton Tag

Source: (Internet search for organic tags)

Now, after years of research, scientists and doctors both proved that there is a direct connection between death causes and high processed foods. (Srour, 2019). In the past years, the nutrition headlights and information campaigns launched by government and media, as well as the growing culture of healthy lifestyle, established the relation between diseases and artificial food in population's minds. There are no conclusive studies regarding consumers in Romania, but as far as the observation went, the consumer of ecological products is the educated adult, from urban areas; the concern also brought a new niche in HoReCa domain, many premises are serving organic foods, wines and use recycled products. A big stake has the social media, where many of local producers found a voice and a regular database of clients. Regarding consumption of BIO products, since the 90s, when the organic and healthy culture had a big start, the revenues were almost 65 million USD in 2019, with almost 30% more than two years ago. In Romania, the growth is between 15%-20% per year, mostly due to the 5% VAT. The most developed country in BIO products consumption is Germany, Romania being placed at the end of the ranking in EU, Sweden having consumption of EUR 197 per inhabitant, Denmark - EUR 277 per inhabitant, while in Romania only EUR 3.72 per inhabitant, as per 2016 data (Analysis - Financeintelligence.ro, 2020).

Figure 2. BIO symbol

Source: (MADR)

As per the data from Eurostat – in table 1 – Organic producers by status of registration process, in Romania in 2018 there were 8,518 registered producers.

Table 1. – Organic producers

GEO/TIME	2012	2013	2014	2015	2016	2017	2018
European Union - 28 countries (2013-2020)	-	257,123	257,641	271,349	295,577	-	-
Belgium	1,435	1,656	1,602	1,733	1,946	2,105	2,264
Bulgaria	2,754	3,854	3,893	5,919	6,964	-	6,213
Czech Republic	3,907	3,910	3,866	4,121	4,271	4,426	4,601
Denmark	2,651	2,563	2,538	2,984	3,306	3,631	3,941
Germany	23,032	23,271	23,717	25,078	27,636	29,764	32,366
Greece	23,448	21,986	20,186	19,604	20,197	27,808	29,594
Spain	30,462	30,502	30,602	34,673	36,207	37,712	39,505
France	24,425	25,467	26,466	28,884	32,266	36,691	-
Italy	43,831	45,965	48,662	52,609	64,227	66,788	69,335
Hungary	1,560	1,682	1,672	1,971	3,414	3,642	3,929
Austria	21,843	21,863	22,184	23,070	24,213	24,998	25,795
Poland	25,944	26,598	24,829	22,295	22,451	20,276	19,224
Portugal	2,833	3,029	3,329	4,103	4,246	4,674	5,213
Romania	15,280	14,553	14,151	11,812	10,083	7,908	8,518
Slovenia	2,680	3,045	3,293	3,412	3,513	3,627	3,738

Source: (Eurostat)

Producer – Organic area cultivated

As it can be noticed in table 2, the area of land cultivated with organic products grew along with global trends and concerns for a healthier lifestyle. In 2000, there were only 17,388 ha – only 0.12% from the total farmland. Before joining the EU, the numbers tripled, having in 2006 an area of 107,578 ha – roughly 0.77% from the total cultivated areas. Romania is still under EU average, with approximately 7% cultivated area.

Table 2. Organic area cultivated in Romania

Year	Organic area (farmland) [ha]
2000	17,388.00
2001	28,700.00
2002	43,550.00
2003	56,800.00
2004	73,300.00
2005	92,770.00
2006	107,578.00
2007	131,456.00
2008	140,132.00
2009	168,288.00
2010	182,706.00
2011	229,946.00
2012	288,261.00
2013	301,148.08
2014	289,251.79
2015	245,924.00
2016	226,309.00
2017	258,471.00
2018	326,260.00

Source: (Research Institute of Organic Agriculture FiBL)

As the EU Common Agricultural Policy came in place, we received more financing and the total of cultivated area tripled from 2006, only 12 years later, reaching 326,260 ha – 2.5% from the total farmland. At the current time, we have an approximate 0.13% growth from one year to another. The number is still low, but as the prediction in table 4 shows, if there is a 4.8 % growth per year, in 10 years there will be almost half of the cultivated area with organic agriculture. This is a scenario based on current numbers, considering that EU will raise the payments for ecological sector, the percent per year may grow in and the target will be reached sooner.

Table 3. Organic cultivated area – Growth Scenario

Year	Organic area (farmland) [ha]	Organic area share of total farmland [%]	Total cultivated area	Growth per year [%]
2000	17,388.00	0.12	1,736,713.44	n/a
2001	28,700.00	0.19	2,864,547.00	0.07
2002	43,550.00	0.29	4,342,370.50	0.10
2003	56,800.00	0.38	5,658,416.00	0.09
2004	73,300.00	0.52	7,291,884.00	0.14
2005	92,770.00	0.65	9,216,699.50	0.13
2006	107,578.00	0.77	10,674,964.94	0.12
2007	131,456.00	0.96	13,019,402.24	0.19
2008	140,132.00	1.03	13,868,864.04	0.07
2009	168,288.00	1.24	16,620,122.88	0.21
2010	182,706.00	1.29	18,034,909.26	0.05
2011	229,946.00	1.64	22,617,488.56	0.35
2012	288,261.00	2.06	28,232,282.34	0.42
2013	301,148.08	2.31	29,419,155.94	0.25
2014	289,251.79	2.22	28,283,040.03	(0.09)
2015	245,924.00	1.88	24,130,062.88	(0.34)
2016	226,309.00	1.73	22,239,385.43	(0.15)
2017	258,471.00	1.98	25,335,327.42	0.25
2018	326,260.00	2.50	31,810,350.00	0.52

Source: (Research Institute of Organic Agriculture FiBL, and author's calculation)

Table 4. Scenario Calculation

Current total cultivated area	31,810,350.00
Value to be reached	15,905,175.00
Current total organic area	326,260.00
Percent of growth	48.75
Percent of growth / 10 years	4.88

Source: (Author's work)

Society and economy − This concept makes the connection between the rural area and the metropolitan area within the European Union. The most important aspect is the financial one, as the higher quality of the products will bring higher incomes within the community.

Another aspect to be considered is that in Romania, 30% of the population is working in agriculture, which means that their only source of income is coming from growing and selling crops. The number of subsistence exploitation – 1-5 ha,

represents 79.8% from the overall agricultural area – as APIA provides. The aged population occupied in agriculture also represents a challenge when trying to convert to new technologies, as studies on generation differences showed – the elders are more conservative than their younger peers.

5. Findings

The mindset of Romanian consumers is not yet educated towards the consumption of organic products; on the other hand, a certain trend can be noticed, which foresees a harmonious development of the market for organic food products. One of the reasons, mentioned above, is to achieve the importance of consuming healthy products for a healthy life (Hanf, 2005).

Organic agri-food products can be found on the shelves of supermarkets or in some specialty shops, but they are addressed to a certain segment of buyers who have a certain education, the products having a higher price, satisfy a niche sector of the market.

One thing is obvious, that the Romanian consumer must be educated. The steps for this can start with the dissemination of information among the administrative structures of the state, the offices and associations subordinated to the Ministry of Agriculture and Rural Development, but also at the level of agricultural associations, at the mayoralty level in each locality, by door-to-door information, which ensures a better understanding of the phenomenon. Also, in schools, magazines, books, educational materials, informative materials should be included.

6. Conclusions

Selling products at local markets is still the main source of income for many families, so landowners cannot give up land cultivation; although they do not have enough budget, practicing unintentional organic farming, they give up buying herbicides, pesticides or fertilizers.

A child who has been informed during school years about the importance of environmental protection and conservation, but also about the consequences of his/her future actions that may harm the ecological balance, will be an adult who will act accordingly. Highlighting the need for healthy eating from a very young age, at the time of maturity the child will remember all these things and take them into account, because they are part of his/her education and values. Romanians have traditionalist behaviour, but without being conservative.

One thing for sure would be the investment in this area, so that the Romanian consumers approach the organic food products, which only bring benefits to the body, ensuring a balanced diet, as well as resistance to stress and pollution. Another important factor in the decision to influence consumer behaviour is the benefit of using the so-called “organic” products: honey and other bee products, herbal teas, homeopathic medicines, etc. These have the role of bringing the consumer closer to nature and ecological values.

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References

[1] Analysis – Sales of Ecological products reached 65 USD millions. *Financial Intelligence* [online] Available at: < https://financialintelligence.ro/analiza-vanzarile-de-produse-alimentare-ecologice-au-atins-65-milioane-usd/> [Accessed 28 July 2020].

[2] Cucu Maria,National Report on the Health Status of the Romanian Population. *INSP. 2017*. Available at: <http://insp.gov.ro/sites/cnepss/wp-content/uploads/2018/11/SSPR-2017.pdf> [Accessed on 27 July 2020].

[3] Fallah, M. P., Skrip, L. A., Gertler, S., Yamin, D., Galvani, A. P. (2015). Quantifying Poverty as a Driver of Ebola Transmission. *PLoS Negl Trop Dis*, 9(12): e0004260. https://doi.org/10.1371/journal.pntd.0004260.

[4] Fletcher, K. (2008). *Sustainable fashion and textiles: design journeys (2nd ed.)*. London; Washington, DC: Earthscan. ISBN 9780415644556.

[5] Grandin, T. (2000). Special reports: Effect of animal welfare audits of slaughter plants by a major fast food company on cattle handling and stunning practices. *Journal of the American Veterinary Medical Association*, 216(6), pp. 848-851.

[6] Graur, M. et al (2006). Guide for a healthy diet. *Romanian society of nutrition*. Iași, Performantica, ISBN: 973-730-240-4; 978-973-730-204-5.

[7] Hanf, V., Gonder, U. (2005). Nutrition and primary prevention of breast cancer: foods, nutrients and breast cancer risk. *Eur J Obstet Gynecol Reprod Biol*. 2005, 123(2), pp. 139-149. doi:10.1016/j.ejogrb.2005.05.011.

[8] Communiqué by IPES-Food (2020). [online]. Available at: < http://www.ipes-food.org/_img/upload/files/COVID-19_CommuniqueEN.pdf> [Accessed on 27 July 2020].

[9] Obesity and overweight (2017). *World Health Organization 2017* [online]. Available at: < https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>[Accessed on 27 July 2020].

[10] Oscar Madzingira. (2018). *Animal Welfare Considerations in Food-Producing Animals*. doi: 10.5772/intechopen.78223.

[11] Research Institute of Organic Agriculture FiBL (2020). [online]. Available at: < https://www.fibl.org/en/themes/sustainability.html> [Accessed on 27 July 2020].

[12] Srour, B., Fezeu, L. K., Kesse-Guyot, E., Allès, B., Méjean, C., Andrianasolo, R. M. et al. (2019). Ultra-processed food intake and risk of cardiovascular disease: prospective cohort study *(NutriNet-Santé) BMJ 2019*, 365, p. 1451.

[13] Willett, W.C., Stampfer, M. J. (2013). Current evidence on healthy eating. *Annu Rev Public Health*, 34, pp. 77-95. doi:10.1146/annurev-publhealth-031811-124646.

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Short-Term Effects of COVID-19 Pandemic on Agri-Food Value Chains in Romania

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Abstract

The value chains in the agri-food industry are affected by the new COVID-19 working standards, considering that, in such a complex and dynamic industry, activities may or may not require intense physical labour, depending on many factors, such as: the technologies used, the level of automation, the logistics performance, etc. However, taking into consideration the peculiarities of the agri-food value chains, it becomes clear that with the new pandemic regulations, the agri-food value chains are under additional pressure. On the one hand, the pressure comes from the new working standards and, on the other hand, the pressure comes from the demand-side of agri-food products. The main objective pursued in this research paper was to quantify the short-term impact caused by the COVID-19 pandemic on the agri-food value chains in Romania, from multiple perspectives. A statistical analysis was carried, highlighting the short term socio-economic implications of the COVID-19 pandemic in Romania at the level of one of the structures within the agri-food value chain, companies operating in the wholesale of agricultural raw materials and live animals, by analysing the evolution of the turnover value indices of these companies. Other relevant indicators were also included in the statistical analysis. The main findings of this study refer to the previously mentioned companies, which successfully met the request from the demand-side in March 2020, when Romania was under the state of emergency due to the COVID-19 pandemic. Not only did these companies efficiently adapt to the new working regulations, but they also managed to turn a difficult situation to their advantage, considering the turnover value index of 201 in March 2020, the greatest value of the index during January-April 2015-2020.

Keywords: value chains, agri-food industry, COVID-19, Romania.

JEL Classification: Q10, Q13

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1. Introduction

The novel coronavirus outbreak (COVID-19) was declared a pandemic by the World Health Organization on March 11th, 2020, considering that this disease was considered highly contagious, with flu-like symptoms and no vaccine was expected by July 2020. Regarding the new COVID-19 working standards, the agri-food value chains are sensitive, especially in Romania, due to many national factors, such as: the low-tech farming practices; the lack of automation in agriculture; the increased demand of agri-food products during the beginning of the COVID-19 outbreak in Romania (March 2020).

Considering this context, the aim of this research paper was to quantify the short-term impact caused by the COVID-19 pandemic on the Romanian agri-food value chains, especially from the perspective of companies operating in the field of wholesale of agricultural raw materials and live animals, by analysing the evolution of the turnover value indices of these companies. Moreover, in order to broaden the scope of this research, the industrial production price indices specific to the agri-food sectors were also analysed, as well as the dynamics of the average prices of agri-food products sold in Romania, before and during the pandemic.

2. Problem Statement

Since Porter's paradigm of value chains, academic and businessmen are more process oriented in order to reach greater added value. Therefore, the former focus on business function is no longer the most efficient approach (Stadler et al., 2015). The next step is to better integrate the risk management tools and procedures in the value chain management (Olson and Wu, 2017). Obviously, this is a very sensitive and skilled activity and it aims to a very precious competitive advantage of the business and product on the long run.

For that to happen, efforts and investments are necessary. But, at the same time, many stressors and risks may occur and the business and the management itself may be put at against the wall. Therefore, adapting the capacity of the production process and to the possible market shakes is another important business objective.

There is a strong academic interest in identifying the impact of several risks and stressors that could affect agri-food industry and agri-food market and several studies were run in order to quantify the impact of pandemics on this market.

Alders et al. (2014) proved that the H5N1 avian influenza impacted village poultry and their owners and changed even the travellers' consumer habits and Gstraunthaler and Day (2008) proved that the main drivers for change are knowledge and a very good awareness of the past.

In fact, beginning with mad cow crisis, the international paradigm has changed. To monitor the traceability is compulsory on this market and innovative technologies were developed in order to prevent food security risks and provide safer products (Jank et al., 2014). Therefore, countries look up for providing national security (Lupien, 2007) and meet population basic needs (Ion, 2020).

The challenge is no longer within the value chains, but also, within the supply chains and value chains connections. New entrepreneurial behaviours are approached where knowledge acquisition and collaborative performance are brought together (Dung, 2020). Moreover, there are opinions that put into discussions the green value chain innovation (Huiling, 2020), so that modern business models to be energy efficient and less polluting.

Yet, all these papers have studied pandemic impact on the raw materials for food industry. This paper aims at identifying another kind of pandemic, population disease upon agri-food market. Precursor ideas were published (Lopes de Sousa Jabbour, 2020; Zhang, 2020; Zhang, 2020) and proved or at least researched the overpowering impact of COVD-19 on the sustainable supply chains and even at macroeconomic level.

Considering all these, there is the obviously need to identify the short-term effects of the COVD-19 pandemic on the agri-food value chains in Romania.

3. Research Questions. Research Hypotheses

After carefully considering the carried out overview of the scholarly literature in the field of agri-food sectors and agri-food value chains, under the influence of the COVID-19 pandemic, this research paper starts from the prerequisite that the Romanian demand for agri-food products was marked by an increase as of March 2020, which was successfully met in the market. To be more specific, there were three hypotheses tested in this research paper, as follows:

- H_1: In March 2020, the turnover value index of wholesale companies was the greatest in the case of companies operating in the field of wholesale of agricultural raw materials and live animals, compared to other types of Romanian wholesale companies;
- H_2: In Romania, based on the NACE classification, the classes specific to the production of meat and poultry meat products (class 1013) and to the manufacture of farinaceous products (class 1073) were among the classes specific to the agri-food sectors which had the biggest industrial production price indices associated in March 2020 among all analysed agri-food classes;
- H_3: During the COVID-19 pandemic (based on available data, March and April 2020), the average price of agri-food products sold on the Romanian markets did not increase, on average, with more than 105%, compared to the average prices of the same products before the pandemic (January and February 2020).

However, supposing that the average price of agri-food products sold on the Romanian markets did not increase with more than 10% and that the increased demand for such products was successfully met during the first months of the COVID-19 pandemic, it can be accepted that the short-term effects on the agri-food value chains are beneficial to the wholesale companies, yet the long-term effects can negatively affect the consumers (due to a potential significant increase of the average prices for agri-food products) and even the producers (the demand might decrease due to many factors, such as: consumers adapting to living

with new COVID-19 regulations, the potential increase in the average prices of the agri-food products and other factors).

Considering the previously mentioned hypotheses, this research aims to provide answers to many questions, including the following: Did the COVID-19 pandemic bring short-term benefits to the companies operating in the field of wholesale of agricultural raw materials and live animals? Under the influence of the COVID-19 pandemic, how was the production of meat and poultry meat products affected by the raising demand in the Romanian market, considering the processing capabilities? Did the agri-food value chains already react to the effects of the COVID-19 pandemic in the form of the increase in the average price of agri-food products?

4. Research Methods

In order to be able to quantify the short-term impact caused by the COVID-19 pandemic on the Romanian agri-food value chains, statistical analyses were carried out. Used to provide necessary and sufficient points to validate or reject the hypotheses, the statistical analyses are based on indicators available on the TEMPO Online platform of the Romanian National Institute for Statistics. The indicators analysed in this research paper are the following:

Table 1. The list of indicators used in this research paper

Indicator Code	Short Indicator Description
COM103L	Turnover value indices in wholesale, working day adjusted series − base year 2015
PPI1033	Industrial production price indices (domestic and non-domestic market) − base year 2015
PPA101A	Monthly average price of products sold in agro-food markets

Source: own indicators selection from the TEMPO Online platform

The indicator codes are kept as extracted from TEMPO Online, on June 28th, 2020. According to The Romanian National Institute for Statistics, the turnover indices are Laspeyres-type indices. Wholesale implies activities specific to product resale in large quantities, without essential transformation of the products, which are resold to retailers, industrial, commercial users and others, but not to final consumers, no matter if sale is meant for domestic market or for export. The turnover is defined by the Romanian National Institute for Statistics as the total income registered by the company, from both the main activity and other activities, but it does not include the VAT, nor the income from the sale and transfer of fixed assets. The COM103L indices for the month of April 2020 are classified as temporary data, as of June 28th, 2020.

The industrial production price index is also a Laspeyres-type index. PPI1033 quantifies the evolution of prices for products delivered during the first marketing

stage by domestic producers during a particular period as compared to a previous period (in this case, the base year is 2015), VAT excluded.

PPA101A refers to the products sold by private agricultural producers and/or their associations in markets within the urban area and in fairs.

5. Findings

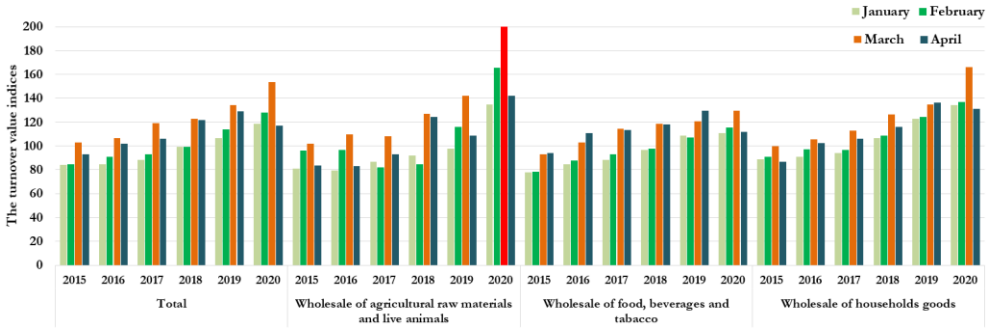

Figure 1. The turnover value index of Romanian wholesale companies during January-April 2015-2020

Source: own conceptualization based on data extracted from TEMPO Online

Nationwide, the turnover value index of Romanian wholesale companies during January-April 2015-2020 increased yearly. The national average growth rate for the previous mentioned timeframe was: 7.25% for the month of January, 8.73% for the month of February, 8.42% for the month of March and 5.07% for the month of April. In the case of companies operating in the field of wholesale of agricultural raw materials and live animals, the average growth rate was marked by even greater values: 11.45% for the month of January, 13.72% for the month of February, 15.36% for the month of March and 13.31% for the month of April. Similarly, the companies operating in the field of wholesale of food, beverages and tobacco registered the greatest turnover value index in March 2020, of almost 130, which is greater with 7.37% than the value registered in March 2019. However, among all the analysed sectors during the January-April 2015-2020 timeframe, the greatest value of the turnover value index was reached by the companies operating in the field of wholesale of agricultural raw materials and live animals, during March 2020, with an index of 201. This was the peak, considering that the second greatest value of the index was registered by the same sector in February 2020: 165.5. Taking this early signal into account, from February, one month before the global pandemic with COVID-19 was officially declared by the World Health Organization, one can notice that the Romanian agricultural sectors were extremely sensitive to an increase in the market demand. As a result, the companies operating in the field of wholesale of agricultural raw materials and live animals recorded an increase in the turnover value index with 41.55% in March 2020 compared to March 2019. Under the influence of a threat to the food safety due to the emerging pandemic in Romania, where the first patient infected with COVID-19 was

confirmed on February 26th, the companies operating in the field of wholesale of agricultural raw materials and live animals managed to respond quickly to the raising demand for such products. As a consequence and immediate result, the turnover value index of the previously mentioned companies recorded the greatest increase during the analysed timeframe, which corresponds to the first impulses of the human kind — to ensure food safety during an uncertain future.

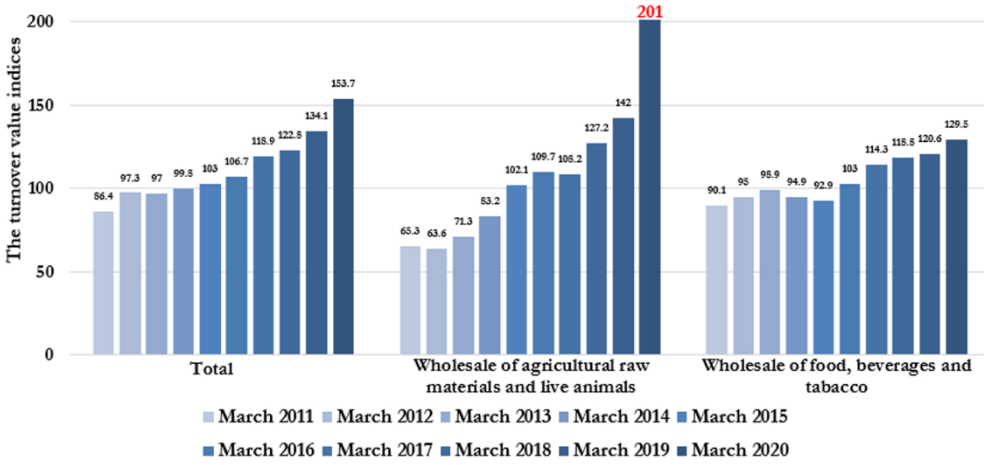

Figure 2. The evolution of turnover value index of the Romanian wholesale companies during March 2011-2020

Source: own conceptualization based on data extracted from TEMPO Online

Therefore, the first hypothesis is validated: in Romania, in March 2020, the turnover value index of wholesale companies was the greatest in the case of companies operating in the field of wholesale of agricultural raw materials and live animals, compared to other types of Romanian wholesale companies.

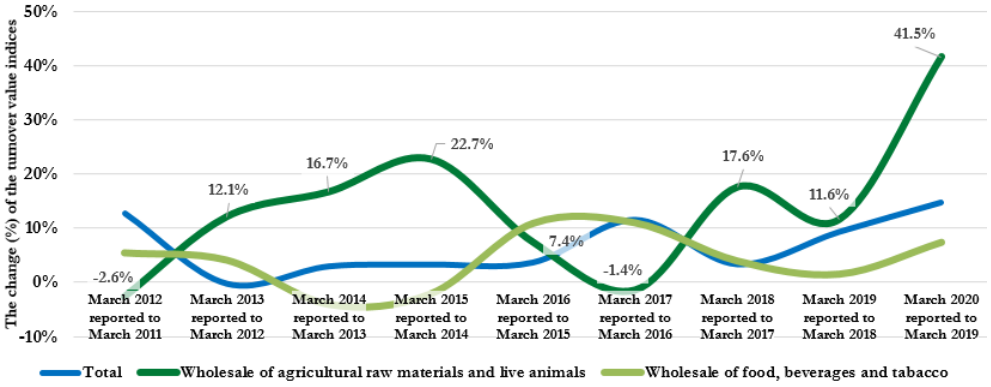

Figure 3. The dynamics of the turnover value index

Source: own conceptualization based on data extracted from TEMPO Online

Data included in Figure 2 strengthens the finding that companies active in the field of agriculture are the first to economically benefit due to human kind perceiving food safety as a major priority when the future is no longer predictable. In Romania, the state of national emergency was declared by the President, on March 16th, 2020. In order to mitigate the spread of COVID-19 in Romania, the exercise of certain rights, including the freedom of movement and economic freedom, was restricted proportionally based on the gradual degrees mentioned in the Decree no. 195 / March 16th, 2020 published in the Official Journal of Romania no. 212 / March 16th, 2020. Considering the restricted exercise of such rights, food safety became a major concern for the individual, while the companies operating in the field of wholesale of agricultural raw materials and live animals managed to turn this situation of national and global crisis into an opportunity to increase the sales of the products that underpin food safety.

Another relevant metric for this study is the industrial production index with regard to the agri-food NACE classes, because it indicates which agri-food chain was the most responsive to the new COVID-19 influenced demand.

Table 2. The industrial production index dynamics before and during the COVID-19 pandemic at the level of agri-food NACE classes

Agri-food NACE classes	March 2018	March 2019	March 2020	2019 compared to 2018	2020 compared to 2019
1052 Manufacture of ice cream	114.48	131.38	139.68	14.76%	6.32%
1013 Production of meat and poultry meat products	111.02	113.93	135.34	2.62%	18.79%
1085 Manufacture of prepared meals and dishes	110.06	119.59	129.79	8.66%	8.53%
1073 Manufacture of macaroni, noodles, couscous and similar farinaceous products	106.59	115.11	121.31	7.99%	5.39%
1089 Manufacture of other food products n.e.c.	116.94	119.32	120.51	2.04%	1.00%
1107 Manufacture of soft drinks, production of mineral waters and other bottled waters	109.35	112.95	120.37	3.29%	6.57%
1062 Manufacture of starches and starch products	110.19	122.71	120.01	11.36%	-2.20%
1084 Manufacture of condiments and seasonings	109.1	111.33	119.54	2.04%	7.37%
1051 Operation of dairies and cheese making	112.33	116.23	119.42	3.47%	2.74%
1105 Manufacture of beer	113.56	118.82	119.37	4.63%	0.46%
1011 Processing and preserving of meat	99.18	95.83	119.2	-3.38%	24.39%

Agri-food NACE classes	March 2018	March 2019	March 2020	2019 compared to 2018	2020 compared to 2019
1091 Manufacture of prepared feeds for farm animals	109.66	113.26	115.25	3.28%	1.76%
1082 Manufacture of cocoa, chocolate and sugar confectionery	106.46	105.82	114.89	-0.60%	8.57%
1071 Manufacture of bread; manufacture of fresh pastry goods and cakes	107.17	111.51	114.52	4.05%	2.70%
1072 Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	106.96	108.2	113.03	1.16%	4.46%
1102 Manufacture of wine from grape	104.7	108.62	112.43	3.74%	3.51%
1083 Processing of tea and coffee	93.97	102.19	110.86	8.75%	8.48%
1061 Manufacture of grain mill products	100.4	110.34	110.37	9.90%	0.03%
1020 Processing and preserving of fish, crustaceans and molluscs	106.8	102.99	107.55	-3.57%	4.43%
1032 Manufacture of fruit and vegetable juice	102.22	102.21	106.97	-0.01%	4.66%
1200 Manufacture of tobacco products	105.53	106.2	106.31	0.63%	0.10%
1012 Processing and preserving of poultry meat	98.34	96.95	104.43	-1.41%	7.72%
1041 Manufacture of oils and fats	95.68	98.27	102.61	2.71%	4.42%
1042 Manufacture of margarine and similar edible fats	93.26	102.9	102.46	10.34%	-0.43%
1039 Other processing and preserving of fruit and vegetables	105.34	99.09	102.4	-5.93%	3.34%
1101 Distilling, rectifying and blending of spirts	96.13	92.65	98.7	-3.62%	6.53%
1104 Manufacture of other non-distilled fermented beverages	89.42	94.85	97.59	6.07%	2.89%
1081 Manufacture of sugar	109.34	96.26	91.97	-11.96%	-4.46%
AVERAGE	**105.15**	**108.20**	**113.46**	**2.90%**	**4.86%**

Source: own conceptualization based on data extracted from TEMPO Online

Based on the processed data in Table 2, on average, for the month of March (2018-2020), the industrial production index annually increased by 3.88%. Reporting the production index during the COVID-19 pandemic (March 2020) to the production index before the pandemic (March 2019), the agri-food chains under the greatest production pressure were: *1011 Processing and preserving of meat* (increase by 24.39%), *1013 Production of meat and poultry meat products* (increase by 18.79%), *1082 Manufacture of cocoa, chocolate and sugar confectionery* (increase by 8.57%). Moreover, the second research hypothesis is validated, because, in Romania, the production of meat and poultry meat products (class 1013) and the manufacture of farinaceous products (class 1073) were among the agri-food chains which had the greatest industrial production price indices associated in March 2020 among all analysed agri-food chains: 135.54 and 121.31. However, the manufacture of ice cream (class 1052) registered the greatest industrial production index in March 2020, 139.67 − which is by 23.10% greater than the national average industrial production index in March 2020 (113.46), at the level of all agri-food chains. The agri-food chain the least responsive to the new COVID-19 influenced demand was the class *1081 Manufacture of sugar*, in which case the industrial production index contracted by 4.46% in March 2020 compared to March 2019, followed by the class *1062 Manufacture of starches and starch products* (2.20% contraction) and the class *1042 Manufacture of margarine and similar edible fats* (0.43% contraction). Only those three agri-food classes were resilient to an increase in the industrial production index during the pandemic.

In order to comprehensively study the short-term effects of the COVID-19 pandemic on the agri-food value chains in Romania, another relevant indicator was considered: the average prices of agri-food products sold on the Romanian markets, before and during the COVID-19 pandemic.

Table 3. The average prices of agri-food products sold on the Romanian markets, before (January, February 2020) and during the pandemic (March, April 2020) (measurement unit: RON per kilogram, with the exception of milk: RON per litre and with the exception of eggs: lei per piece)

	Before the COVID-19 pandemic (Average of January and February 2020)	During the COVID-19 pandemic (Average of March and April 2020)	Percentage change (Prices during the pandemic compared to prices before the pandemic)
Autumn cabbage	RON 2.23	RON 2.86	28.25%
Autumn potatoes	RON 2.53	RON 3.06	20.95%
Dry onion	RON 3.64	RON 4.22	15.96%
Barley malting barley	RON 1.01	RON 1.16	14.93%
Carrots	RON 3.52	RON 3.90	10.95%
Apples	RON 3.31	RON 3.67	10.88%
Dry garlic	RON 16.01	RON 17.67	10.34%
Kidney beans (dried)	RON 10.19	RON 10.65	4.52%
Cows milk	RON 3.05	RON 3.16	3.61%
Cow cottage cheese	RON 18.39	RON 18.85	2.50%
Nuts	RON 7.91	RON 8.04	1.64%
Sheep cheese	RON 24.68	RON 24.91	0.95%
Honey	RON 28.10	RON 28.28	0.62%
Oats	RON 1.10	RON 1.08	-1.82%
Hen eggs	RON 1.04	RON 0.88	-15.38%

Source: own conceptualization, based on the available data (TEMPO Online)

Unfortunately, the processed data in Table 3 is limited to certain agri-food products, at the moment data was taken over from TEMPO Online. The greatest increase in the average price during the COVID-19 pandemic was caused by the vegetables value chain: autumn cabbage (greatest increase in price during the pandemic, 28.25%), autumn potatoes (20.95%), dry onion (15.96%) and others. On the other hand, the hen eggs average price decreased by 15.38% during the pandemic − from RON 0.88 per piece (average during March and April 2020) to RON 1,104 per piece (average during January and February 2020). Lastly, the third research hypothesis is validated, because during the COVID-19 pandemic, the average price of agri-food products sold on the Romanian markets did not increase, on average, by more than 10%, compared to the average prices of the same products before the pandemic.

6. Conclusions

The objective of this research paper was achieved and the short-term impact caused by the COVID-19 pandemic on the Romanian agri-food value chains was quantified, based on the most relevant and reliable available statistical data at the moment this paper was written. All research hypotheses were validated: in Romania, the turnover value index of wholesale companies was the greatest during the COVID-19 pandemic in the case of companies operating in the field of wholesale of agricultural raw materials and live animals (201), compared to the national average of wholesale companies (153.7). The production of meat and poultry meat products (class 1013) and the manufacture of farinaceous products (class 1073) were among the agri-food chains which had the greatest industrial production price indices associated to March 2020 among all the analysed agri-food chains: 135.54 and 121.31. When analysing the national average price for agri-food products, it did not increase by more than 10% during the first months of the COVID-19 pandemic (March and April 2020), compared to the period before the pandemic (January and February 2020).

The main limits of this study refer to the fact that the analysed timeframe was short (the first months of the pandemic) and some statistical data are still classified as temporary data by the Romanian National Institute for Statistics. This study can be extended as more data is gathered. Even though this study was focused on the short-term effects of the COVID-19 pandemic on the agri-food value chains, the long-term effects are more complex to study and require additional indicators to be considered, as well as additional research methods.

References

[1] Alders, R., Awuni, J. A., Bagnol, B., Farrell, P., de Haan, N. (2014). Impact of Avian Influenza on Village Poultry Production Globally, pp. 63-72, *Ecohealth*, 11(1).

[2] Decree no. 195 (16 March 2020). published in the *The Official Journal of Romania* no. 212 / 16 March 2020.

[3] Dung, T. Q., Bonney, L. B., Adhikari, R. P., Miles, M. P. (2020). Entrepreneurial orientation, knowledge acquisition and collaborative performance in agri-food value-chains in emerging markets, *Supply Chain Management*, 25(5).

[4] Gstraunthaler, T., Day, R. (2008). Avian influenza in the UK: knowledge, risk perception and risk reduction strategies, *British Food Journal*, 110(3).

[5] Huiling, L., Dan, L. (2020). Value chain reconstruction and sustainable development of green manufacturing industry, *Sustainable Computing: Informatics and Systems*, 28(100418).

[6] Ion, R. (2020). The role of the population's access to basic needs in building resilience and ensuring food security. Case study of Romania, *Economics of Agriculture*, 67(2), pp. 345-357, Belgrade.

[7] Jank, L., Barrios, S. C., do Valle, Cacilda, B., Simeao, R. M., Alves, G. F. (2014). The value of improved pastures to Brazilian beef production, *Crop and Pasture Science*, 65(11)11, Special Issue: SI, pp. 1132-1137.

[8] Lopes de Sousa Jabbour, A. B., Chiappetta Jabbour, C. J., Hingley, M., Vilalta-Perdomo, E. L., Ramsden, G., and Twigg, D. (2020). Sustainability of supply chains in the wake of the coronavirus (COVID-19/SARS-CoV-2) pandemic: lessons and trends, *Modern Supply Chain Research and Applications*, Vol. ahead-of-print No. ahead-of-print.

[9] Lupien, J. R. (2007). Prevention and control of food safety risks: the role of governments, food producers, marketers, and academia, *Asia Pacific Journal of Clinical Nutrition*, 16, pp. 74-79, Supplement: 1.

[10] Olson, D. L., Wu, D. D. (2017). *Enterprise Risk Management Models*, Second edition, pp. 3-5.

[11] Stadler, H., Kilger, C., Meyr, H. (2015). *Supply Chain Management and Advanced Planning Concepts, Models, Software, and Case Studies*, 5th Edition, pp. 5-15.

[12] The Romanian National Institute for Statistics (2020). Multiple indicators extracted from the TEMPO Online platform.

[13] The World Health Organization (2020). WHO Director-General's opening remarks at the media briefing on COVID-19 − 11 March 2020.

[14] Zhang, S., Wang, S., Yuan, L., Liu, X. and Gong, B. (2020), The impact of epidemics on agricultural production and forecast of COVID-19, *China Agricultural Economic Review*, Vol. ahead-of-print No. ahead-of-print.

[15] Zhang, Y., Diao, X., Chen, K. Z., Robinson, S., Fan, S. (2020). Impact of COVID-19 on China's macroeconomy and agri-food system – an economy-wide multiplier model analysis, *China Agricultural Economic Review*, Vol. ahead-of-print No. ahead-of-print.

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Forest Regeneration in the Context of Current Biodiversity

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Abstract

The forest represents a remarkable natural resource for man and society. Its importance and value is enhanced by the fact that compared to other natural resources like oil, natural gas, coal, forest is characterized by its capacity of reproduction, as a result of a natural process of renewing tree generations. The regeneration of forests, respectively the passage of trees from one generation to another through the application of efficient treatments, is a prime objective in the activity of intensive, rational and multifunctional management of the forestry fund. It is also one of the priority activities in Romania, because the extension of the forest area is done by: regeneration of all forest areas from which timber was harvested, afforestation of land without forest vegetation, ecological reconstruction of land plots affected by degradation phenomena. In this paper, we will see exactly how forest regeneration has evolved in recent years and what are the best strategies for regenerating these areas.

Keywords: Regeneration, forests, biodiversity, ecosystem, environment.

JEL Classification: Q57

1. Introduction

Over time, several factors have acted to the degradation of the forest ecosystem, in different forms, closely related to the population's historical development stage. Their ecological impact, the general imbalances have been increasing continuously and are often irreversible. Deforestation is the main factor, reducing the forested area in favour of the expansion of the agricultural area, or of the need for fuel or construction material. The intensity of these processes is determined by the pace of population growth. Referring to Romania, the main enemy of forest vegetation is

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drought. Most of the time, the steppe vegetation can take over the place of the forests, and the soil has a rather diminished protection. Whatever, the purpose of deforestation remains the main risk factor for the entire forest ecosystem (Kotler, 1998).

The paper will present statistical data on the structure of the forest fund and area, the volumes of wood harvested by species and main destinations and the structure of sales of forest products during the 2014-2018 period. The article will also focus on the cutting area and forest areas that have been regenerated, by land categories. The obtained results will be interpreted and analysed in order to be able to notice the state of Romania at that moment.

In view of the above, in approaching this analysis that involves a quantitative research methodology, we will use series of data processed from the previous statistics and we will identify what are the trends for the forest area and why in our country some factors are anthropically influenced.

The abusive cuts that have taken place in the past 4 decades have led to an export exceeding the regenerative capacity of 143 m^3 of wood from Romania. The erosion processes that started on the upper slopes of the mountainous area intensify as we approach the base, increasing the amount of sediment (Preston, 2000).

The distribution of forests on the territory of Romania is not uniform, and their surface is deficient especially in the plains where the most deforested areas or physical-geographical units are:

- Bărăgan Plain (3.6% afforestation degree);
- Oltenia Plain (5.4% afforestation degree);
- Western Plain (3.1% afforestation degree);
- Transylvania plain (6.7% afforestation degree);
- Moldavian Plain (with only 4.2% afforestation degree).

According to the reports prepared by the Territorial Inspectorate for Forest and Hunting Regime, most thefts were recorded in the hill and mountain areas for the species of hornbeam, durmast, beech, acacia and oak. The worst thing is that many cuts came from the locals after obtaining title deeds and it was found that large areas of forest were cleared in a very short time, thousands of trees being felled and transported with the help of heavy-duty machines, according to the findings from the Forestry Directorate (Castro, 2004).

The governmental measures that were taken to stop the deforestation were the issuing of an emergency ordinance (GEO) through which the forests were redistributed to the forest schools for better management, so the owners of these goods have the obligation to conclude contracts of administration of all land plots only with authorized forest schools (Merce, 2016).

The research topic that we have chosen supposes understanding the economic-ecological mechanism by its specificity and refers to the relationship between man and environment in economic sectors such as agriculture, industry, tourism, forestry, etc. The current situations which Romania is facing are major and need to be linked to the economic and ecological components which will involve efficient

economic management. The dysfunctionalities of the economic and ecological risks will be highlighted, by preserving the forest area in the current context of sustainable development (Hunt, 1999).

2. Problem Statement − Effects of Deforestation

The phenomenon of deforestation affects the climate in several ways. Trees release water vapour into the air, and also provide the necessary shade that keeps the soil moist. This leads to imbalance in the atmospheric temperature, which makes it difficult in certain ecological conditions. This accidental arrangement of forests has led to the disappearance of certain species of animals or we encounter several species that have difficulties to survive or adapt to new habitats (Bran et al., 2011).

The disappearance of forests is known for many negative effects, some of which occur immediately, and others are medium and long term. For the effects that appear immediately we mention soil erosion that will shortly lead to the occurrence of desertification due to the lack of forest curtains. The effects in the medium and long term involve the disappearance of forest vegetation that contributes to the "greenhouse effect", the destruction of plant and animal species or even the damage of the ecosystems of the remaining forest (Daniels, 2003).

Table 1. Regenerated surfaces, by types of regenerations and by categories of land, between 2014 and 2018

Categories of land	2014	2015	2016	2017	2018
Regenerations - total	25,727	26,285	29,505	28,750	28,456
Natural regenerations	**14,701**	**15,848**	**16,997**	**16,904**	**16,841**
in the forest background	14,618	15,848	16,997	16,903	16,841
in land taken over by the forest fund	65	-	-	1	-
in land plots outside the forest fund	18	-	-	-	-
Artificial regeneration	**11,026**	**10,437**	**12,508**	**11,846**	**11,615**
in the forest background	10,088	9,902	10,077	11,260	11,004
in land taken over by the forest fund	106	33	76	61	1
in land plots outside the forest fund	832	502	2,355	525	610

Source: National Institute of Statistics

During the whole period analysed, the artificial regenerations had a much lower weight in the total of the regenerated surfaces than the natural surfaces.

The activity of regeneration of forests is generally carried out continually by maintaining and installing forest vegetation. The seedlings on the natural regenerations occupy a quite large share. For these planted seedlings, it follows a not very easy period, because it takes time to accommodate with the new environmental conditions, with a soil poorer than the soil in a nursery and with the competition of grass species. After planting, it is necessary to perform certain maintenance works on the plantations and the mobilization of soil around the seedlings. Each autumn, it is established the total number of regenerations and the percentage of those which have taken root is also calculated. Those that are dry are replaced in spring.

In the graph below, you can see the structure of the surfaces by types of regenerations, where it is clear that most of the regenerations took place in 2018, about 97.9% (only in forest fund) and slightly over 2% per land outside the forest fund.

Table 2. Artificially regenerated surfaces, by types of artificial regeneration, between 2014 and 2018

Types of artificial regeneration	2014	2015	2016	2017	2018
Artificial regeneration - total	**11,026**	**10,437**	**12,508**	**11,846**	**11,615**
Plantations	**10,969**	**10,315**	**12,456**	**11,790**	**11,578**
from deciduous species	5,162	5,106	7,127	5,632	5,398
from softwood species	5,807	5,209	5,329	6,158	6,180
Direct seeding with forest seeds	**57**	**122**	**52**	**56**	**37**
from deciduous species	54	109	37	31	30
from softwood species	3	13	15	25	7

Source: National Institute of Statistics

Out of the total artificially regenerated area, the largest percentage is represented by the plantations comprising 99.6% resin species over a total area of 6,180 hectares, together with the plantations of deciduous species over 5,398 hectares.

Table 3. Land and soil preparation works, care of young crops and natural regeneration aids, between 2014 and 2018

Name of works	2014	2015	2016	2017	2018
Field preparation	3,683	2,761	2,522	2,977	3,023
Soil preparation	-	2,614	2,222	1,943	1,816
Care works for young cultures	85,308	84,951	88,379	81,378	83,730
Works to help natural regeneration	16,321	17,598	20,353	18,482	18,134
Works for the installation of the natural seedling	5,429	5,840	4,966	5,311	5,417
Sowing and planting under the massif	395	342	224	306	711
Maintenance work	10,497	11,416	15,163	12,865	12,006

Source: National Institute of Statistics

For the year 2018, field preparation works were performed on an area of 3,023 hectares, which represented 46 hectares more than the previous year, soil preparation works on an area of 1,816 hectares, with 127 hectares more compared to 2017 and care of young crops on 83,730 hectares which is 2,352 hectares more compared to 2017.

Conclusion

In the above, we tried to discover what the main factors that influence nature are; overall, this is a study on the development and protection of forests that we must protect, as it offers us great benefits. The forest represents a very important economic resource and is also an attenuator of the climatic factors, because in winter it decreases the amount of snow that comes in direct contact with the soil, during the summer it absorbs the surplus of water, restoring it later in nature, stabilizing the soil and it generates a significant amount of oxygen, representing a good filter for pollutants. If the forests in our country disappeared, over 70% of the species of wild animals and plants would be endangered. The decline of the forest ecosystem will in the future induce some rather serious ecological imbalances such as land degradation, which will have a direct effect on agricultural productivity.

A Romania without forests would look much worse and more vulnerable, which is why we have to make minimal efforts, but coming from as many people as possible, to give an answer to the question "Who will save the forests in our country soon?"

References

[1] Castro, C. J. (2004). *Sustainable development: mainstream and critical perspectives*.

[2] Bran, F., Rădulescu, C. V., Ioan, I., & Popa, C. (2011). *Sinergii globale în direcția protecției mediului.* București: Editura Universitară.

[3] Merce, O. (2016). *Cercetări privind diversitatea structurală a arboretelor din cadrul rezervaţiei naturale "Runcu –Groși".* Universitatea de Științe Agricole si Medicina Veterinara a Banatului Timișoara – USAMVBT, 138.

[4] Daniels, P. L. (2003). Buddhist economics and the environment: material flow analysis and the moderation of society's metabolism. *International Journal of Social Economics*, 30, pp. 8-34.

[5] Hunt, S. D. (1999). The strategic imperative and sustainable competitive advantage: public policy implications of resource-advantage theory. *Academy of Marketing Science*, 27, pp. 144-160.

[6] Kotler, P. (1998). A generic concept of marketing. *Marketing Management*, 7, pp. 48-55.

[7] Preston, L. (2000). Sustainability at Hewlett-Packard: from theory to practice. *California Management Review*, 43, pp. 26-39.

[8] National Institute of Statistics (2014-2018).

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Sustainable Development Goals and Agro-Food System: the Case Study of the Future Food Institute

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Abstract

In 2015, the United Nations Member States adopted the 2030 Agenda, which sets out a 15-year plan to achieve 17 different Sustainable Development Goals (SDGs). The aim is at "ending poverty, protecting the planet and ensuring prosperity for all", providing a holistic and multidimensional view on development. To implement the SDGs, policies need to take account of the interactions among them, minimizing the negative and enhancing the positive ones. This is necessary for avoiding cross-cutting impacts and diverging results, how it happened so far. It is time to search for a key element, transversal to the whole SDGs, able to create interactions and to avoid the aforementioned trade-offs. The agro-food system can play this role, specifically for food security, nutritional and cultural diversity, ecological long-term stability, and climate-smart systems. According to these prerequisites, this paper aims at presenting the case study of the Future Food Institute that developed an open source tool (Food for Earth), still in elaboration phase, in order to model the climate crisis and regenerate the planet, starting from food. This is composed of five innovation areas (Food diplomacy, Circular living, Climate smart ecosystems, Food identity and Prosperity), which involve at different levels the 2030 Agenda SDGs, and four action tools (Humana Communitas, Platforms, Models, and Metrics) to analyse and customize them on some specific cases. Food for Earth may be a very important instrument for policymakers, food authorities, food managers, local governments, etc., who are seeking solutions to environmental problems that require behavioural change.

Keywords: Sustainable Development Goals, Agro-food system, Climate crisis, Circular Economy, Food innovation.

JEL Classification: Q010, Q100, Q500

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1. Introduction

The climate change is no longer an intangible concern since its impacts are being felt worldwide. The IPCC (Intergovernmental Panel on Climate Change) gives humanity 10 years to keep the raising of global warming below 1.5°C. (IPCC, 2018). Right now, climate change is affecting millions of people, thwarting their efforts to escape poverty (Munang et al., 2013) and forcing them to move away from their land to continue surviving. Moreover, the high population growth aggravates this situation as it increases the demand for essential resources: water, energy, medicine, materials, and above all food, contributing to the generation of much more concerns (de Amorim, et al., 2019).

Even if the whole agro-food system contributes between 25-30% to global greenhouse gas emissions (Ritchie, 2020; IPCC, 2019; Poore and Nemecek, 2018), it has great potential to offer emissions efficiency gains, absolute reductions and carbon sinks, while supporting resilience-building and socio-economic development (FAO, 2018). It represents, indeed, a major driver of climate change, changes in land use, depletion of freshwater resources, and pollution of aquatic and terrestrial ecosystems through excessive nitrogen and phosphorus inputs. Thus, it is necessary to uptake innovative technology, practices, and farming systems for meeting global greenhouse gas mitigation and targets and simultaneity for allowing a sustainable increase in food production (Smith and Lampkin, 2019).

In this context, in 2015, the United Nations Member States adopted the 2030 Agenda, which sets out a 15-year plan to achieve 17 different Sustainable Development Goals (SDGs and their related 169 targets). The aim is at "ending poverty, protecting the Planet and ensuring prosperity for all" (United Nations, 2015), providing a holistic and multidimensional view on development. Notwithstanding the early efforts, most of the 169 targets have not been achieved yet. The main concern is the fact that recent trends along several dimensions with cross-cutting impacts, across the entire 2030 Agenda, are not even moving in the right direction (Independent Group of Scientists appointed by the Secretary-General, 2019). Thus, a different way of thinking and approach is necessary, searching for a key element, transversal to the whole SDGs, able to create interactions and to limit the cross-cutting impacts.

The food systems and agriculture are surely transversal to the whole SDGs framework, as also recognized by the European Commission (EC) that unveiled in May 2020 its "Farm to Fork Strategy", for addressing comprehensively the challenges of sustainable food systems and recognizing the inextricable links between people's health, societies and the planet.

According to these prerequisites, this paper aims at presenting the case study of the Future Food Institute (FFI), an Italian non-profit organization that developed an open source tool, called *Food for Earth*. The idea is to model the climate crisis and regenerate the planet, searching beside that to limit the negative interactions and create the positive ones among SDGs.

2. Problem

2.1 Cross-cutting impacts across the entire 2030 Agenda

Despite the initial efforts, the world is not on track for achieving most of the 169 targets that comprise the SDGs. Specifically, four of them are not moving in the right direction, presenting negative trends: rising inequalities (SDG n. 10), climate change (SDG n. 13), biodiversity loss (SDG n. 15) and increasing amounts of waste from human activity (SDG n. 12). Recent analysis, indeed, suggested that these negative trends could cause tipping points with dramatic and irreversible changes for society (Independent Group of Scientists appointed by the Secretary-General, 2019). Thus, even if the 2030 Agenda should be treated as a unitary whole, it is very important to identify what interactions occur among the SDGs, their nature, and what the resulting implications for policy- and decision-making are (Nilsson et al., 2018). The acknowledgment of these connections could prevent diverging results and allow policy makers to be able in planning pathways in order to minimize these negative effects and improve the positive ones. In this context, the academic community has been playing a fundamental role in providing an additional knowledge on the SDGs' interactions, contributing recently with numerous studies (Bennich et al., 2020). For instance, van Vuuren et al. (2015) revealed diverse pathways in order to reach these goals simultaneously, requiring substantial transformations in the energy and food systems and a comprehensive approach that should develop a wider strategy to meet the SDGs by planning near-term actions. Nilsson et al. (2016) highlighted that no one specified exactly how goals depend on each other and thus which are both the negative and positive interactions. If policymakers ignore the overlaps and just start trying to tick off targets one by one, they risk perverse results. In this sense, they propose a seven-point scale of SDG interactions (see 'Goal scoring') to organize evidence and support decision-making about national priorities. Additionally, Pradhan, et al. (2017), using official SDG indicator data for 227 countries, systematized the identification of these synergies and trade-offs. Specifically, positive and negative correlations between indicator pairs allowed for the identification of particular global patterns. SDG 1 (No poverty) has synergistic connections with most of the other goals, whereas SDG 12 (Responsible consumption and production) is the goal most commonly associated with trade-offs. Similarly, Moyer & Bohl (2019) identified some alternative pathways to human development for achieving SDG targets: technology, lifestyle change, and decentralized governance. They showed that, among the different scenario, technology is the most successful in contradiction of the reduced consumption or secondary education, sanitation, and electricity. According to the previous prerequisites, it is necessary to think and approach in a different way, in search of a key element, transversal to all the SDGs, capable of creating interactions and limiting transversal impacts. The agro-food system should play this role as already showed by some recent research models.

2.2 The Agro-food system and SDGs

A first study model, called "the wedding cake", was elaborated in 2016 by the Stockholm Resilience Centre. It shows the wide spectrum of possible goals that can be achieved regarding the biosphere, society, and economy, through actions connected to food. Thus, it placed food as a connection for all the SDGs, moving away from an anthropocentric approach to an ecocentric one (Stockholm Resilience Centre, 2016). This means that all SDGs are directly or indirectly linked to sustainable and healthy food. Indeed, hitting the target of halving food waste would also help to achieve the SDG 1 targets on poverty (less waste equals greater economies for farmers, businesses and families) and SDG 2 on hunger (less waste, more food), as well as to many other targets regarding life on land and underwater and the climate. However, these advances depend on developments in other spheres: innovation, education, strong institutions and partnerships (Stockholm Resilience Centre, 2016).

This model was re-elaborated by TEEB (The Economics of Ecosystems and Biodiversity) - a global initiative that aims at mainstreaming the values of biodiversity and ecosystem services into decision-making at all levels. According to TEEB, the Stockholm model is a necessary but not sufficient condition to achieve social objectives (such as SDG 1 on poverty and SDG 10 on reduced inequalities) and economic ones (such as SDG 8 on good jobs and economic growth). Thus, their SDG wedding cake, focusing on the agro-food system, renames the spheres as in Planet, People, Justice, Dignity, and Prosperity (TEEB, 2019) (Figure 1). Thus, the agriculture and food systems interact through a complex range of multilayer mechanisms with all SDGs. These interactions operate through climate systems, markets and policies, implying potential compromises or managing risks among different goals.

The FFI, i.e. the case study of this research, adopted this latter model, from which a toolbox, called *Food for Earth*, was developed in order to model the climate crisis and regenerate the planet, just starting from food.

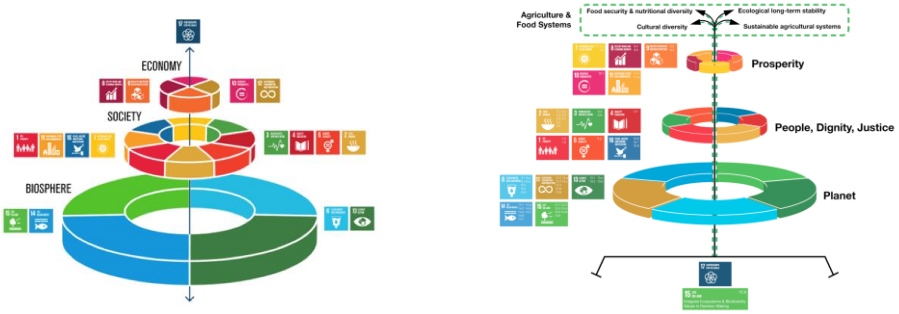

Figure 1. Sustainability models based on food
Source: Stockholm Resilience Centre (2016); TEEB (2019)

3. Aims of the Research

In the light of the preceding statement, the aim of this research is to present a new sustainability model, based on the transversal role of the agro-food system among SDGs, able to create some positive interactions and limit the negative ones specifically for food security, nutritional and cultural diversity, long-term ecological stability and smart climate eco-systems. This study could enrich the academic literature in this field, reporting a new and multidisciplinary approach born from the concrete experience of a non-profit organization (The FFI) acting at the international level with enterprises, private and public research institutions, experts and scientists, individuals and organizations.

4. Research Methods

4.1. Methodology

In this paper, a brief qualitative analysis has been used to develop a summary of the most representative sustainable models applied to SDGs and linked to the agro-food system. Additionally, an empirical analysis has been carried out thanks to the direct involvement of two members (Dr. Sara Roversi (founder of FFI) and Dr. Claudia Laricchia (Head of Institutional Relations and Global Strategic Partnerships, FFI) of the case study, acting as co-authors of this paper. This allowed receiving data directly experienced by them. Thus, the elaboration of the toolbox is the result based on their real professional experience, supported also by the academic researches as reported in the Food for Earth document.

4.2 Case study

The Future Food Institute is a non-profit organization, born in Bologna (Italy) in 2013 as a centre of excellence for food intelligence and a training platform for change-makers, climate shapers and future leaders. Over the time, it has become the core of a wider food innovation ecosystem that has included different living labs around the world. The mission of this new inclusive network and inspirational platform is to make exponential positive change, in order to sustainably improve life on Earth, through education and innovation in the global food systems, in an entrepreneurial way. The network involves: Future Farm (Ravenna - Italy), a 70-hectare farm that becomes a playground for AgTech startups; Future Food Living Lab (Bologna - Italy), a laboratory dealing in food innovation that welcomes hundreds people every day. It offers traditional food, healthy food, and a service to the community that stimulates critical thinking and participation by all; Future Food Americas Inc. (San Francisco), the American headquarters; Future Food China (Shanghai), the Chinese headquarters of the group at the Centre of Excellence, UNIDO ITPO Shanghai; and Future Food Kyobashi Living Lab (Tokyo), the Japanese FF Hub. The network's driven approach is to use examples of life and of lives, capable of inspiring virtuous behaviours. Recently, the FFI has launched an initiative, called "Good after covid-19", connecting people,

entrepreneurs, experts, scientists, to intercept the small positive signs for the future, to try to understand that scenario will leave this current emergency situation, in line with the Farm to Fork Strategy of the EC.

5. Findings

5.1. Food for Earth

As already mentioned, the FFI has developed the *Food for Earth*, an open source toolbox for modelling the climate crisis and regenerating the planet. Indeed, the current post-industrial and globalized society has been revealing both the complexity of the food system, and the consequences that its inefficiency may generate on a local, national, international scale, from an environmental, social and economic point of view. It should be observed the strict interconnection among all natural ecosystems at the decision level, requiring multilevel, multisectorial and multidisciplinary perspectives. Therefore, the *Food for Earth*, catching this issue, offers a different approach to manage the inefficiencies of the agro-food system and its connections with natural ecosystems. Today, in addition to providing universal tools capable of supporting the interpretation of the present, the toolbox is being transformed into a real "compass" to support companies in capturing and analysing the signs of a positive future on which they can invest. For its development, database and sources of information were derived by both a top-down and bottom up approach. The former refers to documents published by FAO and academic scholars, quality interview with experts of important organizations and relative big data. The second concerns the activity of open innovation of FFI with national and international enterprises. Additionally, two phases were crucial for its improvement: a) co-design within international training experiences; and b) validation and involvement of stakeholders. The first one took place during three summer schools, organized in collaboration with FAO in 2019. These focused on the three places where human being has more modified the natural ecosystem and, therefore, needs to intervene for rebalancing the relationship between Human being / Planet. These are cities (Climate Smart Cities, New York, July 2019), rural agricultural areas (Climate Smart Farms, Tokyo, August 2019) and, oceans and seas (Climate Smart Oceans, Iceland, September 2019). The second phase, started in September 2019, has been involving public and private partners, scientists, individuals and organizations. A first version of the toolbox was presented, before the Delegation of the European Union to the United Nations, on September 27th, 2019 at the 74th UN General Assembly and Week for Future, the demonstration of young people for the climate. It is composed of five areas of innovation, which correspond to some of the 2030 Agenda's SDGs, and four tools to analyse and customize them on some specific cases.

5.2. Innovation areas and tools

Food diplomacy refers to the use of a country's food resources to influence global food markets and to influence international political and economic relations beyond the food market. However, it is also a fundamental discipline for the management of access to safe food and water, and of the impacts that environmental catastrophes are generating on agriculture. *Circular living* is an innovative approach aimed at eliminating waste through continuous resource management. By focusing on increasing efficiency, waste outputs are converted into useful inputs, minimizing the loss of resources. *Climate-smart ecosystems* are a smart climate approach that facilitates adaptation design and mitigation strategies, moving from an intensive approach to a low environmental impact approach. *Food identity* provides a representation of the richness and cultural diversity existing in a city's food and social landscape. The interaction of different food identities determines the general culture of the places where the local community resides. *Prosperity* is not isolated from financial gain but it includes critical elements such as emotional, physical, mental and cultural prosperity. The understanding of prosperity must change and develop to include all necessary facets. In this new integrated approach to prosperity, it is necessary to rethink the indicators and generators of well-being and determine how food and nutrition can act as a tool to create new prosperity. All innovation areas are linked to some action tools necessary to analyse and customize them on some specific cases. The FFI identified: *humana communitas* as an entire community keeping diversity as a core value, which influences life on the Planet; *platforms* as emerging tool able to activate and facilitate a positive change; new organizational and regenerating *models* to replicate positive results and make impact exponential; new *metrics* (indexes and data) to measure the impacts deriving from the innovation areas (Figure 2).

Figure 2. Food for Earth
Source: own development

6. Conclusions

For tackling multiple challenges that humankind is facing, policies need to take account of the interactions among SDGs, because these latter may cause diverging results. Therefore, it is necessary to develop pathways that minimize negative interactions and enhance positive ones. FFI recognized this problem and proposed the *Food for Earth* toolbox. Among the innovation areas, identified by the FFI, surely food diplomacy and prosperity involved the majority of SDGs (8 and 7 respectively). Conversely, both climate-smart ecosystems and circular living involve few SDGs (respectively 5 and 4). Two are the SDGs more shared among innovations areas: no. 2 (Zero Hunger) and no. 11 (Sustainable and smart communities). This indicates the important role of urban centres and the agro-food sector for hunger and poverty eradication as well as for preserving the community identities, strengthening the ties that generate social cohesion. FFI already took actions to test the toolbox at different layers: education, for advancing knowledge, and community, for creating awareness. Currently, there are different actions for different people, such as: the Food Innovation Digital Executive Programme to empower and advance the careers of forward thinking professionals already active in the food industry; the digital boot camps and hands-on experience supported by a series of master classes, open conversations, hackathons and FAO e-learning courses, addressed to students, trainers, change-makers and food industry, leaders. The idea is to raise awareness to, for example, food companies in improving their performance in terms of environmental impact (ecological long-term stability); local institutions in undertaking resilience actions with respect to climate change through the use of ecosystem services (climate smart systems); chefs, and consequently the catering sector, in reducing food waste (food security). Finally, in this global health emergency, caused by the Covid-19 pandemic, it is crucial to rethink a new model of the agro-food system. It must be focused more on the human, cultural, environmental and socio-political dimension for facing the problem post this pandemic, as the FFI proposed with its toolbox.

References

[1] Bennich, T., Weitz, N., Carlsen, H. (2020). Deciphering the scientific literature on SDG interactions: A review and reading guide. *Science of the Total Environment,* 728 (2020) 138405.

[2] de Amorim, W. S., Deggau, A. B., do Livramento Gonalves, G., da Silva Neiva, S., Prasath, A. R., Salgueirinho, J. B., de Andrade Guerra O. (2019). Urban challenges and opportunities to promote sustainable food security through smart cities and the 4th industrial revolution. *Land Use Policy*, 87(104065).

[3] FAO (2018). *FAO's work on climate change,* Available at: http://www.fao.org/3/ CA2607EN/ca2607en.pdf.

[4] Independent Group of Scientists appointed by the Secretary-General (2019). *Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development*, United Nations (Eds), New York.

[5] IPCC (2018). *Global warming of 1.5 °C*. Available at: https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf.

[6] IPCC (2019). *Climate Change and Land, Chapter 5: Food Security*. Available at: https://www.ipcc.ch/site/assets/uploads/2019/08/2f.-Chapter-5_FINAL.pdf.

[7] Moyer, J. D., Bohl, D. K. (2019). Alternative pathways to human development: Assessing trade-offs and synergies in achieving the Sustainable Development Goals. *Futures*, 105, pp. 199-210.

[8] Munang, R., Thiaw, I., Alverson, K., Mumba, M., Li, J., Rivington, M. (2013). Climate change and Ecosystem-based Adaptation: a new pragmatic approach to buffering climate change impacts. *Current Opinion in Environmental Sustainability*, 5(1), pp. 67-71.

[9] Nilsson, M., Griggs, D., Visbeck, M. (2016). Policy: map the interactions between Sustainable Development Goals. *Nature*, 534, pp. 320-322.

[10] Nilsson, M., Chisholm, E., Griggs, D., Howden-Chapman, P., McCollum, D., Messerli, P., Neumann, B., Stevance, A. S., Visbeck, M., Stafford-Smith, M. (2018). Mapping interaction between the sustainable development goals: lessons learned and ways forward. *Sustainability* Science, 13, pp. 1489-1503.

[11] Poore, J., Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360 (6392), pp. 987-992.

[12] Pradhan, P., Costa, L., Rybski, D., Lucht, W., Kropp, J. P. (2017). A systematic study of Sustainable Development Goal (SDG) interactions. *Earth's Future*, 5(11), pp. 1169-1179.

[13] Ritchie, H. (2020). Food Waste Is Responsible for 6% of Global Greenhouse Gas Emissions. March 18. Available at: https://ourworldindata.org/food-waste-emissions.

[14] Smith, L. G., Lampkin, N. H. (2019). Greener farming: managing carbon and nitrogen cycles to reduce greenhouse gas emissions from agriculture, Chapter 19. In T. Letcher (Eds) *Managing global warming – An interface of Technology and Human Issues*, pp. 553- 577, Academics press, Elsevier, Editors.

[15] Stockholm Resilience Centre (2016). How food connects all the SDGs. Available at: https://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html.

[16] TEEB (2019). *The 2030 Agenda is indivisible, we cannot cherry pick the SDGs*. Available at: http://www.teebweb.org/sdg-agrifood/annex-2/.

[17] United Nations General Assembly (2015). *Transforming our world: The 2030 agenda for sustainable development*. Available at: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

[18] van Vuuren, D. P., Kok, M., Lucas, P. L., Prins, A. G., Alkemade, R., van den Berg, M., Bouwman, L., van der Esch, S., Jeuken, M., Kram, T. (2015). Pathways to achieve a set of ambitious global sustainability objectives by 2050: explorations using the IMAGE integrated assessment model. *Technological Forecasting and Social Change*, 98, pp. 303-323.

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Nudging as Policy Tool of Local Government for Improving the Ecological Behaviour

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Abstract

The Romanian efforts for implementing waste management started in 2003, with the elaboration and implementation of the National Waste Management Strategy, as a result of the transposition of the European laws and according to the Emergency Government Ordinance no. 78/2000 on the regime of waste, as Romania was preparing the accession to the European Union. In order to align the Romanian laws regarding waste management with the EU laws, the Ordinance no. 74/2018 brought several changes regarding the selective collection of municipal waste.

Romania has a very low waste recycling rate and the objective of the paper is to find efficient tools for influencing the behaviour of citizens regarding environment. In order to encourage the good behaviour of citizens, nudging can represent an efficient tool because lets the freedom of choice while the action is guided in a soft way by a pattern.

At national level, the total quantity of waste per capita decreased from 383 kg/capita in 2005 to 272 kg/capita in 2018. At European Union level, the total quantity represents 489 kg/capita, but the recycling rate is 47.1% in 2018, compared to Romania, of only 11.1%.

Municipalities are responsible for the collection and management of waste, but still, generation and recycling of the waste are the responsibility of all stakeholders, including the citizens. Therefore, the citizens have an important role in increasing the recycling rate and nudging represents an important tool that local governments can implement in order to increase the awareness and responsibility for environment.

The paper presents the results and impact of a pilot project implemented in the 1st District of Bucharest, which uses nudging as a policy tool for influencing citizens for a better selective collection of the waste. The estimative cost of the project is EUR 14,000 with a treatment applied to 25,000 inhabitants (10.5% of the total population of the 1st District).

Keywords: nudge, behaviour, waste management.

JEL Classification: Q5

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1. Introduction

All public institutions deal with public policies, public rules and public tools. The main goal of public institutions and especially of the local authorities is the welfare, a better life for the citizens that they deserve. Once a policy is developed, it must be administrated and implemented and usually this is a long process, it needs good resources, and good administration capabilities. Also, a good implementation depends on the responses of the target players. These target players can be formal organizations or can be ordinary citizens whose compliance with the policy is targeted. An improper implementation of a policy is when the target players may respond to policies in unexpected ways. (Thaler, H. Richard and Sunstein, R. Cass: Nudge, 2009) [5].

Behavioral economics, in contrast to traditional economics, hasnuanced our way of interpreting human behaviour (Hummel and Maedche, 2019) [2]. In order to achieve the welfare and create added values, local authorities are trying to use some specific tools for improving decisions for different areas. One of the new tools which are used is defined in literature as Nudge. As citizens, communities and policymakers, we want to stop "bad behaviours" and we want to encourage "good behaviours", such as: volunteering, voting, and recycling. We, as consumers, sometimes want a little help to "do the right thing" for the "common welfare". But firstly, it is important to define the "right things", to answer to questions like who will benefit from doing the right thing? Answers like to save a little more, eat a little less are values for us, recycle more can be a value for the entire society – though we may be ambivalent about how aggressively we want the State to intervene in these behaviours. (Thaler, H. Richard and Sunstein, R. Cass: Nudge, 2009) [5]. Sometimes we can agree on how we would like policymakers to change our behaviour – and sometimes they "nudge" in those directions. But other times, those nudges have unintended consequences.

2. Importance of Nudging for Local Government Reinforcement

As behavioural scientist Thaler (2009) says "Public and private data alike will become more transparent", says behavioural scientist Richard Thaler. That's an opportunity for some companies and a threat for others. For the public sector, it is mandatory to become more transparent. But how the public sector should change the bad behaviour in a good behaviour? How can it determine citizens to change their behaviour? According to Harvard Business Review of June 15th, 2018 "In particular, behavioural economics − that marriage of economics and psychology that has put terms like "nudge" into the popular lexicon, has provided a powerful tool for changing, in the form of the default enrolment"[3]. Nudge is about choices, how we make them and how we can make better ones. Authors Richard H. Thaler and Cass R. Sunstein offer a new perspective on preventing the countless mistakes we make, including ill-advised personal investments, consumption of unhealthy foods, recycling, and other bad decisions. They argued that since people are such bad decision makers, we should nudge them in the direction of their own desired goals

by orchestrating their choices so that they are more likely to do what achieves their ends [5]. Citing decades of cutting-edge behavioural science research, they demonstrate that sensible "choice architecture" can successfully nudge people towards the best decisions without restricting their freedom of choice.

The "libertarian-paternalistic" concept is also mentioned by David Halpern, the BIT manager in his book, *Inside the Nudge Unit – How Small Changes Can Make a Big Difference*. We need our freedom when we make decisions, but we have to be in a soft way controlled by a pattern. Also, it is good to know that the nudge has no coercive component; it only influences decisions in the easiest way [4].

When applying a new policy, the public administration has to take into consideration the outcomes that the new policy will provide. From practical experience, we know the public institutions spent considerable sums of money for implementing the policies, but very often the outcomes are insignificant. Using the nudge, we want to have value for the money that we spent. Changing, influencing the behaviour is attractive because it offers a better outcome at less cost. Influencing people's actions is not new; at the origins of the bureaucratic approach, the administration has often used different tools like laws, internal procedures, and regulations to achieve the desired outcomes. But the current challenges for the authorities in the health system, environment and tax regulation can be resolved if we try to influence people's behaviour, people's habits, their lifestyles.

All economic and psychological theories developed over the past 15 years are extremely useful in understanding and solving the needs of inhabitants. If the behavioural theory is deployed, our duty as public administration is to try to apply it. For doing this, we need to find innovative solutions in order to build the administration capacity to be open to use and to implement the theory, to identify the type of decisions to respond to nudge. Thaler and Sunstein point out certain types of decisions to respond to nudges well.

- Delayed Consequences Decisions − where the impact of the decision (or non-decision) and its consequences are separated in time (such as smoking now and the risk of lung cancer manifesting later).
- Complex Decisions − where there are many variables to consider in the decision, such as choosing the right health care insurance.
- Overwhelming Decisions − when there are too many choices, or the choices are unfamiliar, such as which exercise routine is best for you.
- Low Feedback Decisions − where there is no obvious feedback from the decision, such as taking vitamins every day.
- Infrequent Decisions − where the decision points come up very rarely, such as choosing between surgeries, medicines or other treatment options for a diagnosis. Decisions like these are the best for nudging. (Thaler, H. Richard and Sunstein, R. Cass: Nudge, 2009) [5].

With all theories deployed in Europe, the first steps have been done with a behaviour change summit in May 2009, which brought together officials across governments, economic external experts, etc. All those involved have understood

that "Influencing behaviour is central to public policy". The Nudge is one of the tools from the "influencing behaviour" field. At present, we find the use of this tool in countries such as UK (UK Department for Environment, Food and Rural Affairs; UK Department for Social Development; UK Department for Transport; UK Department for Work and Pensions; UK Department of Energy & Climate Change; UK Department of Health; UK Financial Conduct Authority), Germany, Austria, Belgium, Croatia, the Czech Republic, Greece, almost in all EU. In each country, there are units or departments which are in charge with influencing behaviour. For all these reasons, we consider the topic relevant for this thesis; practically we have the theory, the method, the context and the needs (Hammerschmid G. (advisor), Munteanu R. A.) [1].

3. Study Regarding Awareness of Citizens for Waste Management

The establishment of a sustainable waste management system remains a tough task for many governments, especially in developing countries that are experiencing rapid urbanization, with limited financial resources available for investment; promoting waste source separation is one of the policy priorities for public authorities for developing countries undergoing an extremely rapid expansion in waste separation. (Zhijian Zhang, Xueyuan Wang, 2020) [6].

We tried to build a team not necessary consisting of experts, but of people with strong skills in public administration, in communication and technical staff from the waste management field. We tried to implement the concept "design thinking for a better common welfare". We know that in public institutions there is a fixed scheme of employees, an organizational chart, and the employees do not want to be involved in activities which are not related with their daily job duties. There is a lack of openness to new ideas. The degree of innovation is very low in our public institutions.

Next step was to extend the team with staff from RP Company (RP Company is responsible for the sanitation within the local administration) and from other departments of the City Hall. Then, we prepared a meeting room very close to the smoking room, more friendly compared to the offices. We intended to create a relaxing working atmosphere, to have something different than the daily job life in order for members of the team to enjoy being part of the project. In this way, we built a team consisting 16 persons [1 economist (the undersigned), 1 corporate social responsibility (from RP), 1 sociologist responsible for data analysis, 1 specialist in communication, 2 technical experts (RP), 10 persons from different departments which are well in contact with citizens (from the City Hall)].

We were thinking to encourage the bureaucrats to increase their creative confidence and vision, in order to overcome the rigid approach. We can develop small projects based on evidence-based analysis, by focusing on how to facilitate the spread of best practice models. As Hammerschmid G. (advisor) and Munteanu R. A. present in 2018, the main steps of the project are the followings: [1]:

A. Defining the outcome was the next step for our project.

Our first goal was to increase the quantity of recyclable garbage using the EAST tool and the RCTc method. We have also defined secondary outcomes, such as:

- to set up a new way of making the selective collection, helping the citizens in the process.
- to develop a map of the current status of the selective collection; to identify the roots of the problem;
- to improve the quality of life and health through a cleaner environment.

The EAST model has been developed by the BIT – Behavioural Insight Team since early 2012. The model is presented by BIT in their publication and also in the book "Inside the Nudge Unit - How Small Changes Can Make a Big Difference", David Halpern, 2015. In the analysis of the model, we will follow, mainly, the book. If we, as policy makers, want to encourage behaviours, let's make it EAST – Easy, Attractive, Social and Timely. These four simple ways of action are based on the BIT's work. After the development of the MINDSPACE model, they decided to develop an easier one. We consider that the model is for "beginners". With the EAST model, the BIT tried not to reflect all complexity and details, they focus on effective behavioural approaches.

B. Understanding the context

From the City Hall perspective, the context is clear. Two years after the new regulation was put in place (in force), the recycle waste quantity is still low, and the City Hall pays the tax for the garbage for all citizens. The budget spent by the municipality/tone of non-recycled garbage is still very high. In the 1st District, there are the following types of buildings: private Rhouses; multilevel buildings (block of flats) – with 2-4 floors without elevators; multilevel buildings – with 5-12 floors with elevators.

Therefore, for the land fill, there is a truck which has to meet a collection schedule in a specific area then the quantity of the collected waste is weighted and stored to the landfill. Also, for the recyclable waste (all in one – paper, glass and metal), there is other garbage truck, different from the landfill truck. After the collection process, the recyclable waste is also weighted and stored to the dry fraction sorting station. The schedule is the following: For multilevel buildings, three times per week on Monday, Wednesday and Friday for landfill. On Wednesday, an extra garbage truck is provided for recyclable waste. For private houses, there are specific days for specific geographic areas and for recyclable waste, every two weeks.

C. Building intervention as the main part of the project

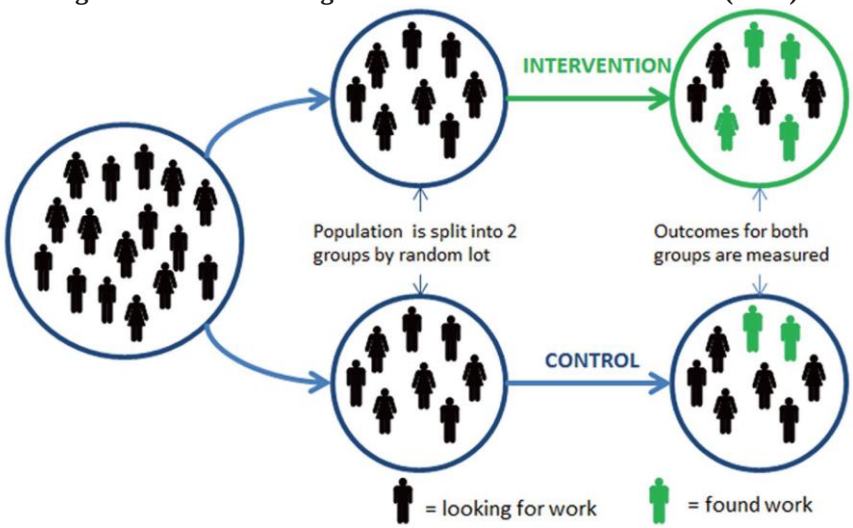
We will design the intervention, which consists of:

a. Designing the choice architecture for improving the way of making the selective collection;
b. Designing a new A3-size poster with a message in compliance with the behavioural economic theory and with the request from point a). Designing all complementary materials, such as: A5-size flyer, stickers, and outdoor banners 6 x 1 m;

c. Designing the support materials, such as: field work sheets, agreement on the dissemination of materials signed by representatives of the landlord associations;
d. Establishing the citizens (the buildings) targeted through the RCTs methodology.

Randomized Controlled Trails (RCTs) is the way to determine whether a policy is working. The RCTs is the main methodology used by Behavioural Insight Team. The novelty of the method is the possibility to compare the effectiveness of a new intervention against what would have happened if nothing would have been changed. The introduction of a control group eliminates the biases that normally complicate the assessment process. In the example "back to work" proposed by BIT, we can see that those who received the back to work intervention ("Treatment") were much more likely to find a job than those who did not. Because we have a control group, we know that it is the intervention that achieves the effect and not some other factor. This method, with the proper academic input, can be much cheaper and simpler to implement.

Figure 1. The basic design of a randomized controlled trial (RCT)



Source: adapted from Hammerschmid G. (advisor), Munteanu R. A. (2018), p. 49, The Use of Nudge at Local Government the Case Study – How to Influence the Citizens from 1st District – Bucharest City Hall to Collect Garbage in Two Fractions, "Dry" and "Wet"

While applying the RCTs, we need to know which of the two or more interventions is the most effective in attending a measurable outcome. By randomly assigning people to groups, we can eliminate the possibility of external factors.

e. Setting up the intervention teams, setting up the schedule with the representatives of the buildings selected in the pilot project programme, each meeting will take place in the street close to their buildings; The buildings selected in the programme will be with 10 floors and 4 floors; Setting up the schedule with the citizens which are living in individual houses (private houses);

f. For those representatives who couldn't attend the first round of meetings, we will set up a second round of meetings in the City Hall Council room;
g. Collecting the data after the treatment;
h. Data analysis;
i. Decision-making process regarding adjusting or not the message and scaling the campaign; the points g, h, i will be developed in the Test, Learn, Adapt area.

Our focus is on the "dry fraction", the recyclable waste, according with our main outcome "to increase the quantity of recyclable waste". Of course, we will also take into consideration the landfill, but we will measure (the weight) only for the collected recyclable fraction.

We decided to test the new choice architecture and the new message on more than 10% of the population of the 1st District. We randomly chose four programmes of garbage collected developed by the RP Company. For each programme, one garbage truck is allocated and the quantity collected is weighted. Therefore, we have individual programmes with individual trucks with weighted quantities of dry garbage. We had the intervention at the level of the buildings which are part of these randomized programmes (randomly selected). The quantity of "dry fraction" was weighted and monitored during 10 weeks, between 18.10.2017 – 20.12.2017. The control group represents other 10% of the population of the 1st District, where there is no intervention for the control group, only the old message. We will also weigh the quantity of the garbage collected from the control group during the 10 weeks of the same period. Then we will compare the quantities collected from individual programmes and the total quantity from all four programmes.

We have randomly selected four intervention (treatment) programmes:

Pr. M01 AP_AL; Pr. M14/MN AP_AL; Pr. M23 AP_AL; Pr. M01/22 CASNIC.

In total, there are:

- 302 multilevel associations from a total of 1,644 (the residential buildings with up to 4 floors and 5 to 12 floors);
- 25 streets with 1,223 postal numbers of individual houses;
- Total targeted population for the "treatment": 25,063 persons, which is about 10.5% of the total number of inhabitants of the 1st District.

We have randomly selected four control programmes:

Pr. M05 AP_AL; Pr. M10 AP_ AL; Pr . M38 AP_AL; Pr . M06 CASNIC.

In total, there are:

- 307 multilevel associations (the residential buildings with up to 4 floors and 5 to 12 floors);
- 22 streets with 1,253 postal numbers of individual houses;
- Total targeted population for the "treatment": 25,304 persons, which is about 10.5 % of the total number of inhabitants of the 1st District.

Table 1. Main results regarding the implementation of the four programmes

I	II	III	IV	V (total I-IV)
AVERAGE (CONTROL) 1,502 AVERAGE (INTERVENTION) 1692,1 GROWTH 12.66% Gross Difference 190.1 Variance (Control) 34,173.3 Variance -Intervention 26,957.4 Std. (Control) 175.4 Std.(Intervention) 155.8	AVERAGE (CONTROL) 2,524 AVERAGE (INTERVENTION) 2,470 GROWTH -2.14% Gross Difference 54 Variance (Control) 27,626.7 Variance-Intervention 107,044.4 Std. (Control) 157.7 Std.(Intervention) 310.4	AVERAGE (CONTROL) 1,980 AVERAGE (INTERVENTION) 2,344 GROWTH 18.38% Gross Difference 364 Variance (Control) 692,800 Variance-Intervention 393,760 Std. (Control) 789.63 Std.(Intervention) 595.30	AVERAGE (CONTROL) 256.7 AVERAGE (INTERVENTION) 343.3 GROWTH 33.77% Gross Difference 86.7 Variance (Control) 13,186.7 Variance -Intervention 13,666.7 Std. (Control) 104.8 Std.(Intervention) 106.7	AVERAGE (CONTROL) 2,002 AVERAGE (INTERVENTION) 2,168.7 GROWTH 8.33% Gross Difference 166.7 Variance (Control) 414,520 Variance -Intervention 28.4016 Std. (Control) 633 Std.(Intervention) 524
t-Test: Two-Sample Assuming Equal Variances				
Observations 10 Hypothesized Mean Difference 0 df 18.0 t Stat -2.4 P(T≤t) two-tail 0.03	Observations 10 Hypothesized Mean Difference 0 df 18 t Stat 0.47 P(T≤t) two-tail 0.65	Observations 10 Hypothesized Mean Difference 0 df 18 t Stat -1.10427 P(T≤t) two-tail 0.28	Observations 6 Hypothesized Mean Difference 0 df 10 t Stat -1.30 P(T≤t) two-tail 0.22	Observations 30 Hypothesized Mean Difference 0 df 58 t Stat -1.09 P(T≤t) two-tail 0.28

Source: adapted from Hammerschmid G. (advisor), Munteanu R. A. (2018), pp. 55-60, The Use of Nudge at Local Government Level. Case Study – How to Influence the Citizens from the 1st District – Bucharest City Hall to Collect Garbage in Two Fractions, "Dry" and "Wet"

The first two programmes developed for the multilevel buildings (I) show that the Intervention increased by 12.66% compared to the Control group. The gross difference is 190 kg, the difference between average. The absolute difference between the two programmes is 1,901 kg. The standard deviation 155.8 is low; we can conclude that we have valid data. Testing the null hypothesis, the P(T≤t)=0.03 shows us that the increase by 12.66% is real in a proportion of 97%. (100-0.03 = 97). We can conclude for this programme that 97% of our increase by 12.66% is real but we consider that we have a small quantity of data.

The second two programmes (II) developed for the multilevel buildings (II) show that the Intervention decreased by -2.54% compared to the Control group. The gross difference is (-54 kg), the difference between average. The standard deviation 310 is too high. Testing the null hypothesis, the P(T≤t)=0.65 shows that the data is real in a very low proportion, of 35%. We can conclude that for this programme the data is not valid or maybe the pair is not well matched, but from a statistical point of view, the treatment didn't work. Splitting the programmes in this way could be unrepresentative. But for us, as a policy maker, it is a question mark and we will have a double check regarding the steps which have been doing during the implementation phase. It is part of the learning curve.

The third two programmes developed for the multilevel buildings (III) show the for the Intervention group an increase by 18.38% compared to the Control group. The gross difference is 364 kg, the difference between average. The absolute

difference between the two programmes in 3,640 kg. Testing the null hypothesis, the $P(T \leq t) = = 0.28$ shows us that the increase by 18.38% is real in a proportion of 72%. We can conclude for this programme that 72% of our increase by 18.38% is real but we consider that we have a small quantity of data. It is an increase unconfirmed from a statistical point of view, but we have an increase in absolute data with 3,640 kilos.

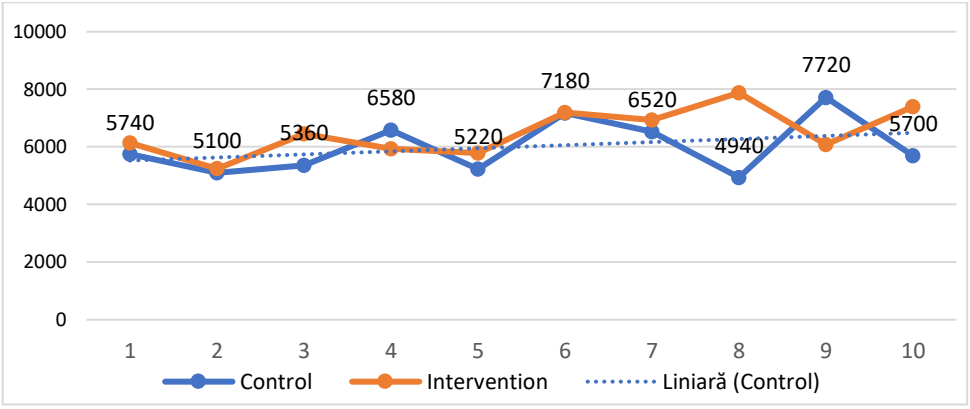
The fourth two programmes developed for private houses show from the first day of our intervention in the streets and meetings with private house owners we have organised that something is going completely wrong with the collective selection of the garbage in the private houses. For the private houses, we didn't change the day of collecting the dry fraction, we kept it the same day as it used to be. Our proposal of intervention was to nudge citizens to realize that the process of collecting is not very complicated; we wanted to give them support and to understand where the problem was. The biggest surprise was from the citizens from 25 streets and 1,223 of postal numbers; we collected the recyclable garbage only from 55 postal numbers. Only 55 postal numbers had the green garbage bin outside of their courtyard. When we discussed with people why they did not put out the bins, they answered that they did not know that Saturday was dedicated to recyclable garbage. They had two garbage bins, one brown and one green, but they put all together and delivered to the RP Company in the day dedicated for wet fraction. In our opinion, this is a fundamental problem and all of this because the bill is paid by the city hall not by the citizens.

The data collected through the private houses programme is available every two weeks, according to the programme developed by RP Company. After we have collected data from the private houses, we understood that there is a real problem of choice architecture, a huge problem of communication and a gap between the services delivered by the RP Company and the amounts paid by the city hall. For private houses, at that time there were 20 programmes designed for collecting the dry fraction with 20 small trucks in charge with collection. With that volume of the recyclable waste provided by the citizens from private houses, in our opinion, is more likely to do it with 5 trucks. In this part of testing, learning, adapting, we realized that for the private house it is not a real problem of influencing behaviour in a certain way and it is a "Big Mistake", as Cialdini defined. We also have determined that only 4.5% from our target groups knew about the specific day allocated for the dry fraction. For these reasons, we decided to develop a set of recommendations regarding the private houses programmes and not to include the data collected in our final analysis because it was not relevant for our main goal, to nudge people for a better collective selection. But it is very important to know that with our pilot project we could understand that the problems, the mechanism and the information collected in the pilot project for private houses are basic evidence for the next steps which the city hall has to implement.

The fifth programme, the Global Analysis without the Private Houses Programmes (V). In the global approach for all programmes implemented for multi-level buildings, the Intervention shows an increase by 8.33% compared to the Control group. The gross difference is 166.7 kg, the difference between average. The

absolute difference between the two programmes is 5,001 kg. The standard deviation 524 is not so high compared to the Mean (2,168.7); we can conclude that we have homogeneous data. Testing the null hypothesis, the $P(T \leq t) = 0.28$ shows that the increase by 8.33% is real in a proportion of 72%. From a statistical point of view, the data can be hardly acceptable, but it is clear that we have an increasing trend of the recyclable waste. We used the null test to also have a statistical approach of all processes; having the absolute data, we can consider that these are basic evidence for our project.

Figure 2. Evolution of the dry fraction collected for ten weeks after the intervention



Source: adapted from Hammerschmid G. (advisor), Munteanu R. A. (2018), p. 61, The Use of Nudge at Local Government Level. Case Study – How to Influence the Citizens from the 1st District – Bucharest City Hall to Collect Garbage in Two Fractions, "Dry" and "Wet"

Conclusions

One of the main problems regarding the selective collection of waste is an "Overwhelming decision", due to the fact that citizens have to decide between too many choices and are not complying with the process.

With the behavioural insight approach, we were capable to deliver successful results into a policy which concerns human behaviour. For the 1st District 1 City Hall, it was the first time when it applied the behavioural economic theory in a scientific approach, building a team, developing all processes, including the stakeholders. Through the project, we have been able to develop the learning curve which delivers very valuables information. We have been able to build a strong capacity team for the project which can share the acquired information with other departments from the city hall for other policy fields. The implementation part with testing, learning, adaptation phases brought a strong information input, as it represented the means to optimize the resources and deliver better results. The feedback from the data collected showed us the limitations and the potential of our interventions, and allowed us to explore the steps where behaviour influence can be made more effective. The transparency of the process and communications can

increase the public and political support for behavioural policy initiatives and decrease the scepticism around the topic.

As Policy Recommendations, we propose:

- to develop the "What Works Team";
- to enhance the communication for implementing the EAST framework;
- to identify and promote the best practice model;
- to implement *"the comfort tax"* for associations which are not doing the waste selective collection;
- to develop an integrated system of waste selective collection;
- to embed the behavioural economics in other city operations.

The development of the pilot project can reinvent the wheel of the traditional Weberian public administration approach into modern public administration related with human behaviour. With the project, we succeed to reach our main outcome to increase the quantity of recyclable garbage using the EAST framework model, to deliver a new choice architecture; we succeed in understanding the problems of the previous mechanism of selective collection and in improving the quality of life insuring a cleaner close environment. We consider that behavioural economics is working at the level of the local government, that this first attempt can be developed across public institutions, given that the awareness about behavioural economics policy will grow and more relevant information will become available.

References

[1] Hammerschmid, G. (advisor), Munteanu, R. A. (2018). The Use of Nudge at Local Government the Case Study – How to Influence the Citizens from 1st District – City Hall, Municipality of Bucharest to Collect Garbage in *Two Fractions "Dry" and "Wet"*, Hertie School of Governance, Germany.

[2] Hummel, D., Maedche, A. (2019). How effective is nudging? A quantitative review on the effect sizes and limits of empirical studies, *Journal of Behavioral and Experimental Economics*, 80, pp. 47-58.

[3] Harvard Business Review June 15 (2018).

[4] Halpern, D. (2015). *Inside the nudge Unit – How small changes can make a big difference*, WH Allen, an imprint of Ebury Publishing, 20 Vauxhall Bridge Road, London SW1V 2SA, 2015.

[5] Thaler, H. R., and Sunstein, R. (2009). *Cass: Nudge – Improving decisions about health, wealth and happiness*, Yale University Press, New Haven & London.

[6] Zhang, Z., Wang, X., (2020). Nudging to promote household waste source separation: Mechanisms and spillover effects, Resources, *Conservation and Recycling*, 162.

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Romanian Foreign Agri-Food Trade in the Context of Global Challenges

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Abstract

Current challenges have led to major changes in economic activities around the world, and the agricultural sector is an area that must continue to develop in order to permanently provide the food needed by the entire population and there is a need for an agricultural system that is socially equitable, economically viable and environmentally friendly to ensure the sustainability of agriculture in the context of constant adaptation to the challenges it faces. Trade in agri-food products continued during the first half of the zear, but with some difficulties in supply, being overworked periods in which demand was very high in a short time because the population was making supplies. The paper aims to analyse the situation in Romania in terms of international trade in agri-food products with a focus on the first quarter of 2020, which coincides with the beginning of the pandemic. As in every quarter of the year, Romanian agriculture is characterized by imports, domestic productions of fresh agri-food products being low during this period due to the seasonal character of agriculture, which is more developed in the warmer period. The purpose of the paper is to identify the level of foreign trade relations in this period, as well as an overall perspective of future agri-food trade. Despite the difficulties, the Romanian agricultural sector continued to work, but it must be effectively supported to ensure food security and safety while considering sustainable development. Based on the results obtained following the quantitative analysis performed on a series of statistical data in the agri-food field, several solutions are proposed to develop the Romanian agri-food supply chain.

Keywords: trade balance, adaptability, food safety, sustainable development.

JEL Classification: Q17

1. Introduction

2020 is a year that began under the emergence of a virus that after mid-February led to a pandemic, period during which the agri-food sector tried to maintain its activities despite all challenges and had to adapt in short time to a pandemic with all its protection requirements and to an instability of the demand on the market, from an over-demand in the first period of the pandemic to a linear demand along the way.

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Trade in agri-food products has to meet the food needs of the population, covering the deficit of domestic production for fresh products in the months when the quantities produced are lower, especially in the cold season. OECD (2020) considers that the spread of the virus has disrupted the supply of agri-food products on both national and cross-border markets, while the pandemic presents challenges for the food system, but is also an opportunity to build resistance to threats.

Food is a basic need, so the level of demand should be less affected by the crisis than the demand for other goods and services and according to OECD (2020), at the macroeconomic level, consumer demand and employment will slightly reduce the demand for food.

The World Bank (2020) mentions that the start of the pandemic has brought uncertainty to the international food market due to the potential for food insecurity, and increased attention has been paid to agriculture in order to maintain optimal conditions for a secure supply chain in order to deliver essential products to consumers, despite restrictions.

2. Problem Statement

FAO (2020) states that border closures, lockdown and supply chain instability and trade disruptions limit people's access to sufficient and nutritious food sources, so we need to know in detail the current situation we are facing with in order to plan actions against the consequences for agriculture imposed by the pandemic.

Two components of trade are imports and exports made during a year, being important activities in the international economic relations of a country (Patriche et al., 1999) International trade has a high contribution to the economic development of states and has developed gradually based on trade relations established through numerous agreements. (Jeníček and Krepl, 2009) The trade dynamics led to a free market that was established through globalization and the effects were seen, in addition to the increase of trade-specific activities, in consumer behavior (Storper, 1992).

Agriculture is an important branch of the economy in most countries, and international agri-food trade differs depending on the agricultural potential of the country and the degree of coverage of demand with local supply. (Gombkötő, 2019) As the authors argue (Popescu et al., 2017), the agricultural sector is an important component in Romanian international trade and must ensure high competitiveness in the European Union. Romania is a country dependent on agri-food imports, especially processed products and the seasonal nature of agricultural production determines a negative trade balance.

Through the study, it is desired to analyse the situation of international trade especially in Q1/2020 to determine how the pandemic is affecting the agricultural sector and international trade in food products. The value created by this study is conferred by the current situation in the context of the presented pandemic which includes information on the values of international trade in agri-food products that Romania has registered and the analysis of the first period of the year, both quantitatively and qualitatively, to create a basis to help determine the strategic directions needed to be implemented that must take into account the adaptability of the Romanian agricultural sector to increase competitiveness in international markets and a series of action plans if the situation worsens.

According to Henry (2020) the current pandemic will have long-term effects on agricultural activities, especially through the implementation of complex risk management on production and food supply in order to reduce dependence on imports. Kerr mentions that during 2020, international cooperation on food trade was essential for the proper continuation of activity and trade in agri-food products continued throughout the pandemic, being essential for providing food for the population. (Kerr, 2020)

3. Research Questions / Aims of the Research

The purpose of the study is to provide a comprehensive overview of the key challenges the Romanian agri-food sector is facing because of the coronavirus crisis. Following the interpretation of the results obtained and the findings made, a series of actions is envisaged, which support the Romanian agricultural sector in the face of challenges and which have in view its sustainable development.

4. Research Methods

The study includes a quantitative analysis about the situation of international trade in agri-food products, transactions being divided into quarters focusing on the first quarter of 2020 which includes an unprecedented situation, in which the population was affected by coronavirus and trade relations were vulnerable and had to adapt quickly to new trends. Using the descriptive statistical analysis, the study is based on a series of univariate numerical data, which characterizes the value of imports and exports made by Romania for the main 10 product categories in terms of developed figures, being static data showing the situation of the first quarter for 2007, 2014, 2019, and 2020. The statistical data about the situation of international trade come from the database of the International Trade Centre which provides updated and official data to determine the level of Romanian trade. Also, some qualitative aspects were addressed regarding the situation of Romania's international trade during the first quarter of 2020, the central objective of the research being the current context facing humanity that is under the incidence of the pandemic.

5. Findings

Following the study, the level of Romania's international trade in agri-food products was determined and the actual context with the presentation of the main aspects that led to the current situation of the agri-food market. Based on the analysed data and interpretations of the results, a series of actions have been proposed that should represent development plans for farmers for the development of their activities.

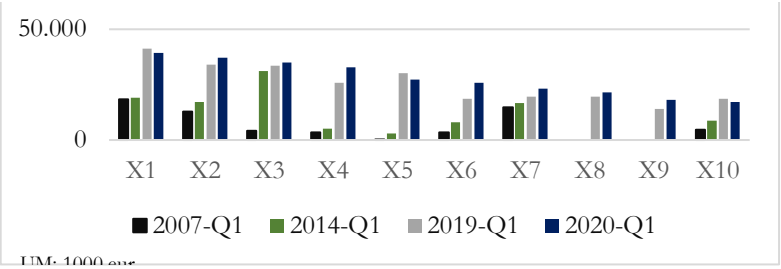
5.1. Structure

The study is based on an applicative part that includes a statistical analysis based on the declared values that illustrate the value level of imports and exports and a qualitative analysis that includes current issues that have influenced the development of trade in agri-food products in Romania.

5.2. Quantitative aspects regarding the situation of Romanian foreign agri-food trade

Following the analysis of the values of imports of processed food and agro-based products from graph 1 of the first quarter of the year in the last 14 years, there is an accelerated growth, registering small oscillations in 2009 and 2014. A comparison

between 2020 and 2007 reveals an increase in the import value of processed food and agro-based products by 278%, the year 2020 compared to 2014 registering an increase by 101%, and the year 2020 compared to 2019 registering an increase in the import value by 13 percentage points.



Graph 1. Evolution of import value for processed food and agro-based products in Romania

Source: adapted from ITC (2020)

Following the analysis of the values of imports of processed food and agro-based products in the first quarter of the year in the last 14 years, there is an accelerated growth, registering small oscillations in 2009 and 2014. A comparison between 2020 and 2007 reveals an increase in the import value of processed food and agro-based products by 278%, the year 2020 compared to 2014 registering an increase by 101%, and the year 2020 compared to 2019 registering an increase of the import value by 13 percentage points.

Table 1. Top 10 categories imported by Romania in Q1/2020

X	HS Code	Processed food and agro-based products
X1	‘21069098	Food preparations, n.e.s., containing, by weight, >= 1.5% milkfat, >= 5% sucrose or isoglucose, >= 5% glucose or >= 5% starch
X2	‘21069092	Food preparations, n.e.s., not containing milkfats, sucrose, isoglucose starch or glucose or containing, by weight, < 1.5% milkfat, < 5% sucrose or isoglucose, < 5% glucose or < 5% starch
X3	‘23040000	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of soya-bean oil
X4	‘17019910	White sugar, containing in dry state>= 99.5% sucrose (excl. flavoured or coloured)
X5	‘33021029	Preparations based on odoriferous substances, containing all flavouring agents characterizing a beverage, containing, by weight, >= 1,5% milkfat, >= 5% sucrose or isoglucose, >= 5% glucose or >= 5% starch, of a kind used in the drink industries (excl. of an actual alcoholic strength of > 0.5% vol)
X6	‘18063100	Chocolate and other preparations containing cocoa, in blocks, slabs or bars of <= 2 kg, filled
X7	‘24022090	Cigarettes, containing tobacco (excl. containing cloves)
X8	‘19059070	Fruit tarts, currant bread, panettone, meringues, Christmas stollen, croissants and other bakers’ wares containing by weight >=5% of sucrose, invert sugar or isoglucose (excl. crispbread, gingerbread and the like, sweet biscuits, waffles and wafers, and rusks)
X9	04061050	HS Code 04061050 - Fresh, cheese, unripened Fresh cheese “unripened or uncured cheese”, incl. whey cheese and curd of a fat content, by weight, of <= 40% (excl. Mozzarella)
X10	‘21039090	Sauces and preparations thereof, mixed condiments and mixed seasonings (excl. soya sauce, tomato ketchup and other tomato sauces, liquid mango chutney and aromatic bitters of subheading 21039030)

Source: adapted from ITC (2020)

Analysing the top 10 categories of products with the highest share of value in the total value imported by Romania of processed food and agro-based products registered in the first quarter of 2020 that are in table 1, it is found that:

The category food preparations, containing, by weight, >= 1.5% milkfat, >= 5% sucrose or isoglucose is the import category with the highest share in total imports of processed food and agro-based products, this representing 5.79% in 2007 out of the total of the analysed import segment, in 2014 representing 3.21%, and in 2020 its share remaining approximately constant and representing 3.26% although the imports registered approximately a double value. Comparing this category with 2007, it increased by 113%, compared to 2014 registering an increase by 105%, and compared to 2019 its value decreased by approximately 5%.

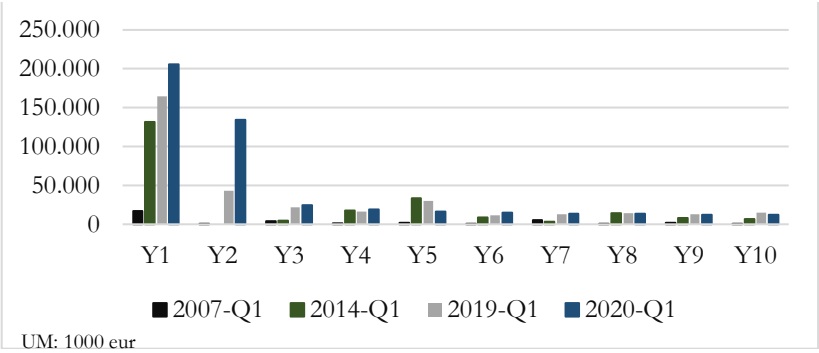
In second place is the category complementary to the above one, namely food preparations, not containing milkfats, sucrose, starch isoglucose or glucose category which recorded an increase by 9 percentage points in 2020 in comparison with 2019.

Compared to 2019, although in 2020 there were decreases in value by 10% and 7% respectively, the preparations based on odoriferous substances, containing all flavouring agents and sauces and preparations therefor, mixed condiments and mixed seasonings managed to register significant values so as to be located in the top value of imported products.

Regarding the cigarettes, containing tobacco category, although it registered a significant increase compared to 2007, 2014 and 2019, the share of the value in the total segment value is declining due to the faster pace of the overall segment.

The category white sugar, containing in dry state >= 99.5% sucrose together with chocolate and other preparations containing cocoa, in blocks, slabs or bars of <= 2 kg, filled, and fruit tarts, currant bread, panettone, meringues, Christmas stollen, croissants and other bakers' wares are categories that recorded significant values, together representing 6.65% of the total value of imports from the segment analysed in 2020.

An increase by 30% recorded in 2020 compared to 2019 is found among fresh cheese "unripened or uncured cheese", incl. whey cheese and curd of a fat content, while the category of oilcake and other solid residues, whether or not ground or in the form of pellets registered an increase of only 4%, although compared to 2007 it registered a value increase by 761% (in 2014 representing 5.22% of the analysed segment). Analysing the exports of processed food and agro-based products in the first quarter of each year from 2007 to 2020 in terms of value from graph 2, it can be seen an upward trend in their value. In 2020, compared to 2007, the value of exports in this segment increased by 1,007 percentage points, compared to 2014, the value increased by 87 percentage points, and compared to 2019, they increased by 24 percentage points.



Graph 2. Evolution of exported value for processed food and agro-based products in Romania

Source: adapted from ITC (2020)

Table 2. Top 10 categories exported by Romania in Q1/2020

Y	HS Code	Processed food and agro-based products
Y1	'24022090	Cigarettes, containing tobacco (excl. containing cloves)
Y2	'24039990	Manufactured tobacco and tobacco substitutes, and tobacco powder, tobacco extracts and essences (excl. chewing tobacco, snuff, cigars, cheroots, cigarillos and cigarettes, smoking tobacco whether or not containing tobacco substitutes in any proportion, "homogenised" or "reconstituted" tobacco, nicotine extracted from the tobacco plant and insecticides manufactured from tobacco extracts and essences)
Y3	'21069098	Food preparations, n.e.s., containing, by weight, >= 1.5% milkfat, >= 5% sucrose or isoglucose, >= 5% glucose or >= 5% starch
Y4	'23063000	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of sunflower seeds
Y5	'15121191	Crude sunflower-seed oil (excl. for technical or industrial uses)
Y6	'15121990	Sunflower-seed or safflower oil and their fractions, whether or not refined, but not chemically modified (excl. for technical or industrial uses and crude)
Y7	'22021000	Waters, incl. mineral and aerated, with added sugar, sweetener or flavour, for direct consumption as a beverage
Y8	'23040000	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of soya-bean oil
Y9	'16023230	Prepared or preserved meat or meat offal of fowls of the species Gallus domesticus containing >= 25% but < 57% of poultry meat or offal (excl. sausages and similar products, finely homogenised preparations put up for retail sale as infant food or for dietetic purposes, in containers of a net weight of <= 250 g, preparations of liver and meat extracts)
Y10	'23064100	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of low erucic acid rape or colza seeds "yielding a fixed oil which has an erucic acid content of < 2% and yielding a solid component of glucosinolates of < 30 micromoles/g"

Source: adapted from ITC (2020)

Analysing the main ten categories of products that hold the most significant share in the total export value in Romania of the segment (accordingly to table 2), it is noticed that:

The category with the highest value share in the export of processed food and agro-based products is the cigarettes category, containing tobacco category which has a significant contribution since the analysed base year, 2007 (year in which it

represents 24.24% of the total value of the segment), in the first quarter of 2020 it represented 26.25%. The accelerated increase in the value of the processed food and agro-based products segment and at the same time the maintenance of the weight of the category at a high value made it to be in continuous upward trend, in 2020 compared to 2019, registering an increase by 25.37%.

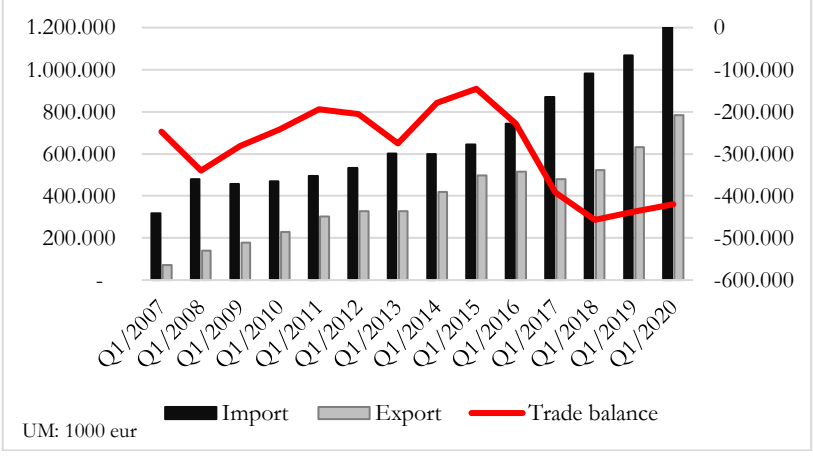
The second place is held by the category of manufactured tobacco and tobacco substitutes, and tobacco powder, tobacco extracts and essences which also registered a significant value in terms of export of the analysed segment, representing 17.14% of the total value in the year 2020.

Categories such as crude sunflower-seed oil; oilcake and other solid residues, whether or not ground or in the form of pellets; prepared or preserved meat or meat offal of fowls of the species gallus domesticus; oilcake and other solid residues, whether or not ground or in the form of pellets are categories that, although they registered value gaps regarding the year 2020 compared to 2019, they registered significant export values on the analysed segment; at the same time registering substantial increases in the period 2007-2020.

Regarding the category of food preparations, n.e.s., containing, by weight, >= 1.5% milkfat, >= 5% sucrose or isoglucose, this although reduced its share in the total segment value, it managed to register a significant increase, in 2020 increased by approximately 526 percentage points compared to 2007.

An increase by 5.41% in 2020 compared to 2019 also registered the category of waters, including mineral and aerated, with added sugar, sweetener or flavour, for direct consumption its value fluctuating during the analysed period, however it registered in 2020 values higher than 2007 and 2014. The category of oilcake and other solid residues, whether or not ground or in the form of pellets and the category sunflower-seed or safflower oil and their fractions, whether or not refined, but not chemically modified, are categories in full ascent, reporting both to the period 2007-2020 as well as reporting the year 2020 to the year 2019.

The graph 3 illustrates the evolution of balance trade for the processed food and agro-based products category in the first quarter of 2007-2020.



Graph 3. Trade balance of Romania for processed food and agro-based products
Source: adapted from ITC (2020)

During the entire analysed period, there is a trade deficit, Romania's exports being significantly lower for the processed food and agro-based products category, the largest deficit being in Q1/2018 when -456,884 thousand euros were registered, and in the last 3 years recorded the highest negative values. The value of exports had an increasing trend, except for 2017 when it decreased by 7% compared to the previous year but stabilized rapidly in 2018.

5.3. Qualitative aspects regarding the situation of Romanian foreign agri-food trade

This international situation has led to socio-economic challenges that in principle have had a negative impact because some economic activities have suffered due to precautions imposed at the national level, their activity being minimal or even completely blocked as employees were sent into technical unemployment, the income being reduced and consequently the purchasing power, being sought after the basic agri-food products. The rules on social distancing and multiple checks have caused problems with employees, most of whom are seasonal and who have given up these jobs, and for the remaining ones, safety conditions being imposed.

The high flow of entries into the country and border controls have led to delays of trucks with goods, and for fresh products this has led to quality depreciation. Also, because it was necessary to quarantine drivers, the cost of transport increased considerably because there was a small number of vehicles available for international shipping and the demand was high from Romania, being a period in which agri-food imports are high.

Given the limitation of economic activities, Romanian farmers have turned to online commerce and their own stores. Also, local products and Romanian producers were highly promoted, they quickly adapted to the events and tried to continue their commercial activity as much as possible because agricultural production existed, but it needed demand. Through social networks and online stores, farmers have moved to a modern trade, adapted to the current needs of customers who could no longer purchase the desired products from physical stores due to travel restrictions imposed to avoid crowded places, through which the products reached directly to the final consumer. Romanian consumers were delighted with this method and preferred to order and consume local products to the detriment of imported ones to support the Romanian farmer.

5.4. Strategic directions regarding the development of the Romanian agricultural sector

Farmers must move towards processing by developing infrastructure for processing Romanian raw materials and diversifying the range to meet consumer demand and limit imports for certain categories of agri-food products, investments in cultivation in protected areas for fruits and vegetables, optimal storage conditions in order to extend the storage time for products suitable for stock, innovations and innovative products that contribute to the increase of crop yields and to the improvement of product quality.

One way that leads to the development of farmers is the association, the cooperatives offering a greater power on the internal market by adapting to the needs of Romanian consumers and certifying them to the latest standards that will increase their competitiveness and through a continuous cooperative development will determine the development of foreign markets through exports. In order to develop

agricultural activities, it is necessary to optimize the farm and schedule production so to increase the season in terms of supply of fresh products for a longer period, to cover the off-season so that Romanian products are available for a longer time to limit imports and to have the security of an economic viability. Farmers must resort to the additional protection that assures them that they will obtain the discounted productions, such as anti-hail systems and irrigation systems, but also to the agricultural insurances in case of natural disasters.

6. Conclusions

Optimization of the supply chain management for agricultural sector and constant adaptability to the requirements of the population are necessary for the development of agriculture. Responding to the impact of COVID-19 on food security Romanian farmers must consider the medium and long-term development of agricultural activities to ensure a large part of the needs of consumers. For Romania, according the quantitative analysis, the imports of processed food products are important to serve the market demand, in a context in which the processing of food raw materials is difficult due to the reduced investments in the processing infrastructure, so the Romanian producers must try to develop their activity towards processing.

References

[1] FAO (2020). *COVID-19 pandemic – impact on food and agriculture*. Retrieved from http://www.fao.org/2019-ncov/q-and-a/impact-on-food-and-agriculture/en/.

[2] Gombkötő, N. (2019). International Trade in Agricultural and Food Products. *International Journal of Commerce, Business and Management*, 6(3), pp. 2319-2828.

[3] Henry, R. (2020*).* Innovations in Agriculture and Food Supply in Response to the COVID-19 Pandemic. *Molecular Plant*, 13(8), pp. 1095-1097.

[4] ITC (2020). *International trade in goods – Monthly imports 2002-2020.* Retrieved from https://www.intracen.org/itc/market-info-tools/statistics-import-country-product-monthly/.

[5] Jenicek, V., & Krepl, V. (2009). The role of foreign trade and its effects. *Agricultural Economics (AGRICECON)*, 55, pp. 211-220.

[6] Kerr, W. A. (2020). The COVID-19 pandemic and agriculture: Short- and long-run implications for international trade relations. *Can J Agr Econ*, 68, pp. 225-229.

[7] OECD (2020). *COVID-19 and the food and agriculture sector: Issues and policy responses*. Retrieved from http://www.oecd.org/coronavirus/policy-responses/covid-19-and-the-food-and-agriculture-sector-issues-and-policy-responses-a23f764b/.

[8] Patriche, D., Stanescu, I., Grigorescu, M., & Felea, M. (1999). *The basics of trade,* Economica, Bucharest.

[9] Popescu, G. H., Istudor, N., Nica, E., Vasile, A. J., Ion, R. A. (2017). The influence of land-use change paradigm on Romania's agro-food trade competitiveness − An overview, *Land Use Policy*, 61, pp. 293-301.

[10] Storper, M. (1992). The Limits to Globalization: Technology Districts and International Trade, *Economic Geography*, 68(1), pp. 60-93.

[11] World Bank (2020). *Food Security and COVID-19*. Retrieved from https://www.worldbank.org/en/topic/agriculture/brief/food-security-and-covid-19.

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How Important are the Sustainable Development Goals? A Bibliometric and Modern Data Analysis

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Abstract

The Millennium Development Goals were adopted by the UN in 2000, the main objective being to reduce extreme poverty by 2015. This perspective from the beginning of the millennium was to shape the direction of the world towards sustainable development. The 2030 Agenda for Sustainable Development, adopted by all UN member states in 2015, offers a common perspective to follow in order to ensure peace and prosperity for people and planet. This paper aims to highlight the significance of sustainable development by tracking it in literature and day-to-day media. A bibliometric study is used to identify its research importance and to highlight the importance of the different goals of the UN: no poverty, zero hunger, good health and well-being, quality education, gender equality, etc., having into consideration the frequency of their appearance in academic literature and media. The paper starts from the premise that each goal represents an up to date topic in the research world.

Keywords: sustainable development; Millennium Development Goals (MDGs); Sustainable Development Goal (SDGs); bibliometrics; research; journalistic data; social media.

JEL Classification: Q01

1. Introduction

Sustainability is, in fact, the ability to maintain the integrity of an entity over time (Basiago, 1999) while in practice and in the academic vocabulary the concept is applied in order to promote a healthy socio-economic and ecologic environment for the human society (Milne & Gray, 2013). The term of sustainability is defined as an efficient and equitable sharing of resources along generations in order to operate socio-economic activities of a finite ecosystem (Stoddart, et al., 2011).

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Sustainable development represents the principle of achieving human development while at the same phase sustaining the natural systems to provide the input that the society depends on (Cerin, 2006). Global parties have always been public on promoting the efficient use of global resources.

The up to date concerns into this theme are represented by the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs), where both of these topics mark historic global mobilization to achieve worldwide targets (Breuer, et al., 2019). After the 15 years' time frame of the MDGs', their proposed goals were not 100% achieved, hence, the today's need of a new set of goals, that are to be reached by 2030, which is in fact a call for action; the main themes of those SDGs are widely spread, summarized in the permanent focus on the people, planet, peace, prosperity and partnerships (Taylor, 2016).

2. Problem Statement

Multiple academics, increasingly in the latest decades, have concentrated on innovative analysis and research resulting in a material growth in this area of academic activity (Cancio, et al., 2017). This item was solely demonstrated not only through daily publication tracking, but also by the increasingly number of research and education centres that are set up. Places of such importance are gathering more and more specialists, that are continuously innovating and improving the business process of sustainability research (Chen, et al., 2010) (Cancino, et al., 2015) (Fagerberg, et al., 2012).

As the number of innovative publications and research grows, it is quintessential to further investigate what are the main topics of the most productive and influential figures in the research branch, together with the need of identifying the major papers and source universities.

Sustainability research is more than a knowledge search, it is meant to offer a secure future. Conventional academic research, with strong methodology foundations, tends towards shallow analyses and weak improvement proposals as they are solely proposing to engage with the studied subject and become the impetus for change, while shifting towards sustainable thinking in any topic requires more than just plans and overthinking but organized action (McManners, 2019).

This paper is proposing the analysis of the scientific research regarding SDGs in order to demonstrate the importance of this topic in modern times and aims to correlate journalistic data and social media to this topic.

3. Research Questions / Aims of the Research

The current study is, firstly, wanting to show how relevant are the SDGs in the perspective of current research and then, to describe the multiple applications of the SDGs.

The research question represents the title of the report and describes the importance of the SDGs. How important are the Sustainable Development Goals?

The real significance of the research question is, by answering it, to identify and state how often the SDGs appear in multiple kinds of information sharing channels.

A predefined search approach at this research stage consists in presenting the multiple kind of data used, such as, bibliographic, authorship and journalistic, that is going to be reviewed with modern software and multiple contextual adapted and on scope methods. The effective search will be completed through scientifically proven engines on research databases of peer-reviewed, subscription-based and open-access literature.

The second research objective wants to show that the SDGs are an up-to-date research topic and they can be easily found in all major aspects of our lives.

Research hypothesis tested in this piece of research is: SDGs do represent an important part of academic research, and more than this, it actually represents a subject that is highly popular among different parties.

4. Research Methods

For multiple years, bibliometrics have been used quite frequently in literature, due to its advanced opportunity in affirming specific or general areas of interest. To completely understand the importance of bibliometrics, multiple definitions have been noted. As Pritchard (1969) noted, it is mostly a mathematical and statistical methodology that translates the nature and state of written communication. Broadus (1987) indicates that this methodology signifies a quantitative study of published papers, bibliographic entries or both. Easier, Norton (2001) defines this concept as a direct assessment of textual data. In the last two decades, new uses have been attributed to bibliometrics. In accordance with Daim (2006) the recent path aims toward exploration, organization and large-scale data analysis of historical entries in order to observe the unseen patterns that may help researchers in the process of decision making.

In the following paragraphs, the current research design will be presented.

As a starting point, the keyword interrogations will be performed as a data curtain, specific academic literature will be reviewed using the citation analysis, words frequency (Zipf, 1932) and a modern approach on multiple information media.

5. Findings

The results of the multiple analyses are summarized in Table 1 where the value of link strength indicator represents the interlinkage of each paper based on the citation methodology (both quantitative and co-authorship) and in Table 1A a summary of top 5 words (with the occurrence threshold of 10) will be presented for each database (based on binary counting). The curious note that needs to be noticed is the lack of word multiple counting as going towards more than two keyword searches. It is impossible to find a matching word by top occurrence confirming the uniqueness of each paper and publication source. Excluding the development related phrases for the occurrences, it can be stated that the databases come, in this case, to complete each other not to duplicate the results. In the relevance ranking of

the words, it can also be noticed the independence of the terms between the sources. These two perspectives on the top 5 terms represent the importance of dataset selection when studying a topic.

Table 1. Result of the Quantitative Co-Authorship analyses

Set of Keywords	Database interrogated	Unit: Authors/Countries	Link strength (top3)	Citations (top3)	Documents (top3)
Agenda 2030	WOS	Stenberg, K.; Stafford-Smith, M.; Alderman, H.	28, 27, 22	157, 135, 9	2, 2, 1
Agenda 2030	WOS	U.S.A.; Switzerland; U.K.	150, 117, 115	1081, 656, 958	98, 55, 61
Agenda 2030	Scopus	Bhutta, Z.A.; Cowx, I.G.; Lynch, A.J.	37, 34, 34	134, 35, 35	2, 2, 2
Agenda 2030	Scopus	U.S.A.; U.K.; Switzerland	511, 436, 310	5087, 4266, 3572	341, 204, 144
MDG	WOS	Deribew, A.; Melaku, Y. Adama; Misganaw, A.	48, 48, 48	51, 51, 51	3, 3, 3
MDG	WOS	U.S.A.; U.K.; Canada	201, 159, 74	1158, 809, 302	152, 76, 39
MDG	Scopus	Bhutta, Z. A.; Akseer, N.; Daelmans, B.	126, 73, 71	363, 79, 356	23, 8, 5
MDG	Scopus	U.S.A; U.K.; South Africa	588, 443, 229	6306, 4103, 1450	521, 310, 153
SDG	WOS	Lawford, R.; Anand, M.; Bahadur, K.	21, 20, 20	20, 18, 18	2, 1, 1
SDG	WOS	U.S.A.; U.K.; Australia	219, 165, 126	1314, 1187, 764	116, 78, 53
SDG	Scopus	Wang, J.; Li, Y.; Wang, X	46, 38, 38	15, 23, 18	14, 12, 8
SDG	Scopus	U.S.A.; U.K.; Germany	599, 505, 263	238, 199, 84	341, 250, 126
Sustainable development	WOS	Al-Adawi, S.; Boyling, C.; Braithwaite, J.	18, 18, 18	5, 5, 5	1, 1, 1
Sustainable development	WOS	U.S.A.; U.K.; China	107, 79, 79	371, 203, 852	62, 39, 128
Sustainable development	Scopus	Chen, X.; Wang, Y.; Wang, J.	72, 72, 70	17, 6, 16	18, 33, 30
Sustainable development	Scopus	China; U.K.; U.S.A.	374, 331, 315	148, 83, 63	611, 193, 250

Source: VOSviewer

Table 1A. Top 5 words occurrences in both Title & Abstract search

Keyword	Source	Top 5 by occurrences (# of occ.)	Top 5 by relevance (relevance rating)
Agenda 2030	WOS	nation (105), health (82), person (79), indicator (73), development agenda (71)	nutrition (4.57), disaster risk reduction (4.27), sendai framework (3.92), agriculture (3.75), territory (3.64)
Agenda 2030	Scopus	approach (64), study (63), country (44), city (40), china (36)	agriculture (2.36), climate change (2.28), sustainable development agenda (1.86), violence (1.61), united nations sustainable development... (1.41)
MDG	WOS	development goal (286), sust. dev. goal (183), data (162), development (139), sdgs (99)	climate change (3.39), civil society (3.33), cross sectional study (2.58), vision (2.30), live birth (2.19)
MDG	Scopus	approach (64), study (63), country (44), city (40), china (36)	agriculture (2.36), climate change (2.28), sustainable development agenda (1.86), violence (1.61), united nations sustainable development... (1.41)
SDG	WOS	data (120), health (84), process (83), target (82), indicator (74)	global burden (4.92), cause (3.82), mortality (3.58), death (3.55), estimate (3.26)
SDG	Scopus	health (59), evidence (49), implementation (40), agenda (40), application (39)	relationship (2.26), circular economy (2.02), concept (1.91), influence (1.75), comparative analysis (1.5)
Sustainable development	WOS	region (74), technology (68), production (67), application (67), growth (61)	sdg (3.53), catalyst (3.22), ecosystem service (3.12), forest (2.52), urbanization (2.16)
Sustainable development	Scopus	review (112), application (82), sus dev goal (39), evidence (38), role (36)	ecosystem service (2.02), comparison (2.01), carbon emission (1.9), climate change (1.85), systematic review (1.33)

Source: VOSviewer – Software interpretation

In the following paragraphs, the second stage of the bibliographic data interpretation will be presented. It can be noticed in Table 2 that the results come in different ways, depending on the search procedure. The topic that is the most researched is based on the keywords search of the "sustainable development" in both the title and the abstract of the research papers that were in scope. It can also be noticed that the time frame matches with the start of the sustainable development era, reflecting the primary efforts in late 1980. By this solely part of the research, it can be summarized that the sustainable development topic is at its glance in present times and the impressive numbers of citations per year indicate the relevance of this matter throughout the academic world. The h-index (Hirsch index) for the keywords of sustainable development, matching the 287 value indicates the number of papers that have multiple citations with a relevant annual citing index of 6.85. In the "sustainable development goal" search, there are a lot of papers about this topic within their abstract while a smaller number of papers contain this word group in their title. Similar situation for the "millennium development goal" while "agenda 2030" search appears to track the papers starting from 2009 matching the transition from the 2000-2015 period to the current one of 2015-2030 that introduces Agenda 2030 as the new guiding strategy towards sustainable development. When analysing the number of research papers containing the 4-word groups in their abstract and title, it can be noticed in Figure 1 that the most prolific years in terms of publishing were 2019 for Agenda 2030, 2017 for the SDGs, 2010 for the MDG and 2006 for sustainable development. Truly when considering both peer-reviewed and open access research work, the SDGs represent an up to date topic.

Table 2. Google Scholar interrogation

(Search type) & Key Words	Publication years	Papers	Citations	Citations/ year	Citations/ paper	Authors / paper	h-index	g-index	h-norm	h-annual
(Abstract) Agenda 2030	1998-2020	990	8,734	397	8.82	1.86	37	82	30	1.36
(Title) Agenda 2030	2009-2020	1000	6,275	570.45	6.28	1.7	32	66	25	2.27
(Title) MDG	2003-2016	49	125	7.35	2.55	1.63	4	9	3	0.18
(Abstract) MDG	1986-2020	980	33,811	994.44	34.5	1.89	78	171	60	1.76
(Title) SDG	1989-2020	958	4,921	158.74	5.14	2.04	31	56	20	0.65
(Abstract) SDG	1981-2020	980	160,408	4,113.03	163.68	2.44	196	358	145	3.72
(Title) Sustainable development	1984-2020	980	314,526	8,736.83	320.94	2.12	287	508	234	6.5
(Abstract) Sustainable development	1986-2020	980	316,009	9,294.38	322.46	2.1	287	508	233	6.85

Source: Publish or Perish – software interpretation

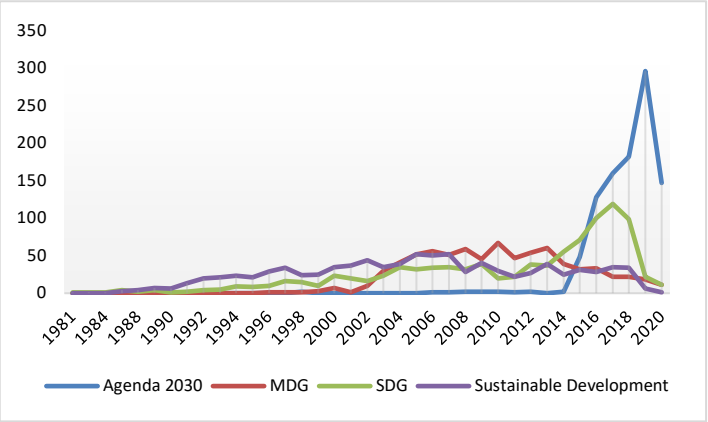

Figure 1. Number of papers by year
Source: Google Scholar – Publish or Perish interpretation

The newspaper analysis, the first part of the non-academic analysis can be noticed through applying direct correlation thinking as the following:

Figure 2. Multiple snips from The New York Times website
Source: Official website of the newspaper

In Figure 2 where several snips of the main headlines have been taken from three different dates (the exact date of the headline can be seen bordered in red) several assumptions have been made, most of them are freely noticeable and can easily be induced in the same manner. For example, out of the 7 titles chosen, 4 were guided by the current pandemic state but even though this theme is largely spread across all media, key SDG data could also be traced, as for example the headline with number 7 where the respective article presents a restaurant that promotes no food waste, a principle that is strongly in accordance with the SDG 2 and SDG 12. This newspaper has also several themes that automatically filter the shown information (action that can also be found in the upcoming sources) that clearly guide the reader into a better understanding of the SDGs traceability and this could represent an opportunity for future SDG transparency.

Figure 3. Multiple snips from The Guardian website

Source: Official website of the newspaper

In Figure 3, the same process has been applied. Similarities, including the topic dashboard, are obvious but the most important thing is that there are news that are not correlated to the current health aspect of our times but of course those snips have been selected from multiple titles that surely included COVID-19 related notes.

Both of these papers present their headlines together with a short summary, important thing that was taken in consideration when the correlation to the SDG was made.

Figure 4. Multiple snips from The Wall Street Journal website

Source: Official website of the newspaper

The following source can be noticed in Figure 4, where again, similarities have been noted as the topic dashboard and pandemic topics. This newspaper website does not include summaries for the past articles, but conclusions had been taken out without any issue, just from the headline.

Figure 5. Multiple snips from the Financial Newspaper (Ziarul Financiar)
Source: Official website of the newspaper

And as a final newspaper, an important Romanian piece has been chosen as it has a large variety of topics out of the tabloid world. Figure 5 shows a non-English source, but key info can be drawn from the short summaries as headlines are not present this time. The first article describes the difficultness that the small local producers in the pasta food sector face in the market. The second article describes the need of zootechnical investment for the national agriculture; the third part refers to the permanent need of continuous learning, while the last paragraph indicates the IT innovation of several youngsters.

All the SDGs correlations of these newspapers' snips can be noticed in Table 3 where SDG 3 has truly dictated the global news, but new topics emerge daily and it is clear that the SDG transparency can be applied even at this level of information sharing.

Table 3. Summary of the SDGs correlated to the Newspapers articles

Source	Number of interrogations	Month of the interrogations (current year)	Selected articles	Most frequent SDG (# of times)	Least frequent SDG (# of times)	Most SDGs per headline	Dashboard leading to what SDG (not all)
The New York Times	3	July, July & January	7	SDG 3 (4 times) due to COVID-19 followed by SDG 2, 8, 10 &12 (the three of them linked 2 times each)	SDG 9, 14 & 16 (1 time each)	4 goals (SDG 2,3,10 & 12)	Business SDG 8; Politics SDG 16 & Tech, Science SDGs 7 & 9
The Guardian	3	July, March & January	9	SDG 16 (3 times)	SDG 2, 5, 10 & 12 (1 time each)	1 goal	Environment SDG 13, 14 & 15; Coronavirus SDG 3; Global Development SDG 8 & 9
The Wall Street Journal	3	July, April & December 2019	9	SDG 3 (3 times); SDG 2 (3 times)	SDG 12 & 13 (1 time)	2 goals (SDG 2,3 & 12)	Politics SDG 17; Economy & Business SDG 8 & 9; Tech SDG 11
The Financial Newspaper (Ziarul Financiar)	3	July only	4	SDG 2 & 8 (2 times)	SDG 4 (1 time)	2 goals (SDG 2, 8 & 2, 12)	Focused on financial topics but the Business from Zero correlates to SDG 8

Source: Own interpretation based on the info available on the official websites of the newspapers

For the social media analysis, the elected posts do not include personal posts that are intended to promote personal life. The noticeable link to at least one SDG

is the main criteria of selection and further than this, the respective posts show the effort made for achieving the goals and targets of the respective SDG. The selection of influential social media content related to the SDGs can be seen in Table 4 containing the Instagram posts and in Table 5 the complete description of the respective images. The motivation for correlating the respective posts with SDGs is the following: The idea behind the first post (1A) is the cooperation of people to overcome another famous post. As this holds the world record at this moment as the most liked Instagram post, it clearly shows how cooperative people can be successful in their scope. This is the exact manner that must be applied to reach all Agenda 2030 targets for a better world. The 2A post encourages the planting trees operations in Indonesia, showing the need of a better environmental care across the globe while in the second part of the post it counts the number of trees that had been lost since the first reading of the post. SDGs 13 and 15 are the natural choice, but cooperation and awareness can also be shared through this idea. The 3A post of President Obama presents the equal rights of all people. The same principle is highly promoted by the SDGs since their inception while the 4A post of a well-known pop band stands again for equal rights and no violence. Nothing is as appreciable as global efforts to promote peace and equality.

The values that the SDGs promote are universal and the way the current world (influenced by the infinite internet data) evolves must be sustainable. Everyone should learn and follow these opportunities indicated by the SDGs in order to have a better place for everyone and leave no one behind.

Table 4. Instagram posts snip

1A Post	2A Post
	
3A Post	**4A Post**
	

Source: Instagram

Table 5. Summary of the social media posts in relation to the SDGs

Source	Owner	Post description	Number of likes	Date posted	Image	SDG	Link
Instagram	Chris Godfey	Photo of an egg	54.6 mil	January 4th, 2019	1A	2, 17	https://www.instagram.com/
Instagram	tentree	Planting trees in Indonesia for likes	15.5 mil	April 22nd, 2019	2A	13, 15	https://www.instagram.com/
Twitter	Barack Obama	No one is born hating another person because of the colour of his skin or his background or his religion…	4.3 mil	August 13th, 2017	3A	4, 10, 16	https://twitter.com/
Twitter	BTS	We stand against racial discrimination. We condemn violence. You, I and we all have the right to be respected. We will stand together.	2.1 mil	June 4th, 2020	4A	4, 10, 16	https://twitter.com/

Source: Instagram & Twitter

The events on the SDGs topics will be overseen in the following: the first global event that needs to be mentioned is the yearly United Nations' High-level Political Forum on Sustainable Development, held since 2013, an event that concentrates the plans and efforts made by countries in achieving the Agenda 2030 and it adopts intergovernmental negotiated political declarations. This event is also the place where each state presents the National Reviews. The second event is the Global Forum for National SDG Advisory Bodies, held since 2019, which forms partnerships with the governments to identify clear pathways to achieving the SDGs. The third event, SDG Business Forum, acts like a platform for all stakeholders to perform key dialogue on the distinct role of the private sector in addressing current background for a future that will be reached through sustainable development.

The existence of forums and workshops on the theme of sustainable development and applied through the SDGs represents that it is indeed an important global topic but the lack of clear and structured plans that reflect the budgeting and financial perspectives for all states represent the complexity of this theme and the difficultness of applying a global plan at a national or regional level.

6. Conclusions

The non-academic content analysis used previously provided a contextual framing of the latest and most influential informational media, such as: social media, magazines, newspapers and international governmental meetings. This analysis solely corresponds to strict textual analyses of the presented materials and can be criticized of subjectivism but correlated with additional scientific research methods proves to formulate a satisfactory conclusion.

The systematic literature review has been noticed in the previous chapter where peer-reviewed and open access papers have been analysed in order to show the importance of this topic. In the current pandemic state, a sustainable future is the most appropriate plan to be followed, and what could be more appropriate than well-tailored guidelines from the experts in sustainable development?

The applications of the SDGs find relevance all around us, news, posts and efforts are oriented towards achieving the goals and reaching their targets. The frequency of appearance of related topics is nothing then pure confirmation of the fact that the Sustainable Goals truly represent a durable perspective.

The multiple dataset interrogations show that the numbers of papers have been increasing along the years but nothing as the recent increase in this year in publications related to Agenda 2030 as shown previously, reaching the peak at almost 300 papers per year just in 2019 while the SDGs reached peak around 2017 with 100 papers.

The research question has been answered and the research hypothesis has been validated in multiple ways, showing the relevance of the SDGs throughout academic, political and media environments and all initial objectives have been reached with ease just by presenting the quantitative numbers on this topic.

The review was guided by the principles of systematic review and the data collected through the paper included articles, theses, conference papers and documents available on the before-mentioned systems confirming initial conditions. The documents were clearly identified using both keywords and title components and no restrictions were imposed on the search others than what was already mentioned. The process involved both quantitative content analysis as described in the works of (Elo & Kyngäs, 2008) (Hsieh & Shannon, 2005) (Mayring, 2000) and own design subjective techniques that involve logical correlations. The series of tests, which were manually performed, were aimed at offering further evidence that the SDGs do represent an important theme. Pieces of gathered information were presented in a summarized manner to give a more concise and refined conclusion regarding the relevance of the analysed data.

The process of recovering from this pandemic hit would have to be guided on the principles promoted by the SDGs. This time around, compared to other international crises, humanity has a guideline and clear targets to be achieved. Only a national tailored strategy having the SDGs as guideline can foster economic growth and development of internal systems.

References

[1] Basiago, A. D. (1999). Economic, social, and environmental sustainability in development theory and urban planning practice: *The environmentalist*. Boston Kluwer Academic Publishers.

[2] Breuer, A., Janetschek, H., & Malerba, D. (2019). Translating sustainable development goal (SDG) Interdependencies into policy advice: *Sustainability*. MDPI German Development Institute.

[3] Broadus, R. N. (1987). Toward a definition of bibliometrics. *Scientometrics*, 12, pp. 373-379.

[4] Cancino, C., Merigó, J., & P.-M. D. (2015). A bibliometric analysis of innovation research. *CID Working Papers*.

[5] Cancio, C. A., Merigó, J. M., & Coronado, F. C. (2017). A bibliometric analysis of leading universities in innovation research. *Journal of Innovation & Knowledge*, pp. 106-124. doi:https://doi.org/10.1016/j.jik.2017.03.006.

[6] Cerin, P. (2006). Bringing economic opportunity into line with environmental influence: A discussion on the coase theorem and the Porter and van der Linde hypothesis. *Ecological Economics*, pp. 209-225. doi:10.1016/j.ecolecon.2005.01.016.

[7] Chen, J., Damanpour, F., & Reilly, R. R. (2010). Understanding antecedents of new product development speed: A meta-analysis. *Journal of Operations Management*, 28(1), pp. 17-33.

[8] Daim, T. U., Rueda, G., Martin, H., & Gerdsri, P. (2006). Forecasting emerging technologies: Use of bibliometrics and patent analysis. *Technological Forecasting & Social Change*, 73, pp. 981-1012.

[9] Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), pp. 107-115. doi:10.1111/j.1365-2648.2007.04569.x.

[10] Fagerberg, J., Fosaas, M., & Sapprasert, K. (2012). Innovation: Exploring the knowledge base. *Research Policy*, 41, pp. 1132-1153.

[11] Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), pp. 1277-1288. doi:10.1177/1049732305276687.

[12] Mayring, P. (2000). Qualitative content analysis. Forum: *Qualitative Social Research*, 1(2).

[13] McManners, P. (2019). *Increasing the Impact of Sustainability Research − A New Methodology*. J Sustain Res.

[14] Milne, M. J., & Gray, R. (2013). W(h)ither ecology? The triple bottom line, the global reporting initiative, and corporate sustainability reporting. *Journal of Business Ethics* (118(1)), pp. 13-29.

[15] Norton, M. J. (2001). *Introductory concepts in information science*. New Jersey.

[16] Pithchard, A. (1969). Statistical bibliography or bibliometrics. *Journal of Documentation*, 25(4), pp. 348-349.

[17] Stoddart, H., Schneeberger, K., Dodds, F., Shaw, A., Bottero, M., Cornforth, J., & White, R. (2011). *A pocket guide to sustainable development governance*. Stakeholder Forum 2011.

[18] Taylor, S. J. (2016). *A review of sustainable development principles: Centre for environmental studies* . University of Pretoria.

[19] Zipf, G. (1932). *Selected Studies of the Principle of Relative Frequency in Language*.

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Challenges in Environmental Goods and Services Sector in Romania

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Abstract

The current challenges posed by globalization have led to changes in technology and new priorities for economic policies. Pollution and current patterns of resource use are unsustainable. The players involved have paid more attention to the environmental sector because it has a major role in the transition of economies to sustainable development. Economic growth is influenced by environmental conditions. The paper aims to study the evolution of the environmental goods and services sector in Romania, in 2014-2017. The paper analyses data related to the value of output in the environmental sector, employment and the value of exports. The number of people involved in this domain decreased by 16%, from 190,883.81 FTE (full-time equivalent) to 159,542.79 FTE in the period analysed. Regarding the output value from the total activities, it had an oscillating trend, and the environmental domains from CReMA (Classification of Resource Management Activities) registered the highest values compared to those from CEPA (Classification of Environmental Protection Activities). In the case of exports, there is a slight increase in environmental services from RON 13,630.51 million in 2014 to RON 14,555.15 million in 2017. Thus, Romania should focus more on the environmental goods and services sector as it can contribute to the growth of the national economy and can be an important pillar in the development of green economy.

Keywords: environment, environmental goods and services, employment, export.

JEL Classification: Q01, Q56, F18, F6, O44

1. Introduction

The environmental goods and services sector (EGSS) represents those production activities of a national economy that generate environmentally friendly products. These products are manufactured for the purpose of environmental protection and resource management. The current challenges posed by globalization have led to changes in technology and new priorities for economic

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policies. The environmental goods and service sector is one of interest for the decision makers as it represents a sector with growth potential.

Interest in the sector of environmental goods and services was initiated in the early nineties by the Organization for Economic Cooperation and Development (OECD) and the European Commission and in 1999 "The Environmental Goods and Services Industry: Manual for Data Collection and Analysis" was released. The Regulation (EU) no. 691/2011 on European environmental economic accounts establishes a common framework for the collection, compilation and transmission of data on environmental accounts. The legal basis for the development of accounts in the environmental goods and services (EGSS) sector in the European Union is the Regulation of the European Parliament and of the Council (EU) no. 538/2014 of April 16th, 2014 amending the Regulation (EU) no. 691/2011 on European environmental economic accounts (EC 2014). According to the OECD/Eurostat (1999) definition, the environmental industry consists of activities that produce goods and services for measuring, preventing, limiting, minimizing or correcting environmental damage to water, soil aeration, and waste issues, noise and ecosystems.

The main benefit from this sector is the fact that it has a major role in the transition of economies to sustainable development. Also, advantages in this sector can be in the employment and national welfare. The concern for environmental issues has increased and it has economic implications, on the one hand there are opportunities in this sector and on the other hand the costs in the field are increasing. Therefore, it is important to understand how this sector influences the economy through environmental protection and newly created jobs. Thus, the objective of the study was the evolution of the environmental goods and services sector in Romania in 2014-2017.

2. Problem Statement

Current global trends in the state of environmental factors have led to greater concerns about reducing risks due to imbalances between humans and nature, as anthropogenic activities have led to environmental pressures. Human life, as well as the economy, depends on ecosystem of environmental goods and services (EGS) that influence the well-being of individuals and communities (Summers et al., 2018).

The consolidation of the process of development and economic growth in the medium and long term in Romania can be done simultaneously with the transition to an economic model that has a negative impact as low as possible on the environment and the balances of natural ecosystems.

There is a growing recognition that new technologies and other innovations can provide a tangible means to achieve sustainability. The EGS sector provides technologies, goods and services to reduce environmental impact and increase resource productivity in a wide range of economically critical industries (NSW Government, 2019). Also, environmental industries bring economic and employment benefits (Zhou & Moinuddin, 2015).

Romania's capacity to provide efficient public infrastructure and services in the field of environmental protection, both at national and local level, is an important factor in stimulating and supporting sustainable economic development (Frone, 2012).

EU guidelines indicate the need to focus on environmental activities and products (Eurostat, 2016). Green economy indicators are useful tools for informing policy-makers and transitioning to an ecologically stable society, but also an economically solid and equitable one (UNEP, 2012).

The environmental goods and services sector is a sub-set of the whole economy (Eurostat, 2016). Environmental protection includes all activities and actions which have as their main purpose the prevention, reduction and elimination of pollution and of any other degradation of the environment. Those activities and actions include all measures taken in order to restore the environment after it has been degraded. The environmental goods and services (EGSS) sector, also called the environmental economy or eco-industries, refers to producers of goods and services aimed at protecting the environment and managing natural resources. The EGSS provides technologies, goods and services to reduce environmental impact and increase resource productivity of a wide range of industries in the national economy. It is also seen as a key ingredient of industrial competitiveness, trade advantage and social stability in a world where the pressure to protect environmental resources is increasing (Sinclair-Desgagné, 2008). It includes both environmental protection activities (e.g., those aimed at reducing the negative impact on the environment) and resource management (conservation and reduction of natural resource depletion) (Eurostat, 2018).

The EGSS framework developed by Eurostat (2009) provides descriptions and specifications of activities to be considered as environmental activities (UNEP, 2012) and it is a vital tool for facilitating the greening of the economy due to the innovations in this sector. Environmental economic accounts have been designed to better reflect both the contribution of the environment to the economy and the impact of the economy on the environment (Rosiek, 2017). It is also a means of monitoring economic pressures on the environment and exploring how they could be mitigated (Eurostat, 2019).

The environmental goods and services sector consists of companies and institutions that are involved in activities related to the measurement, prevention, limitation, minimization or correction of environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems (OECD, 1999; Eurostat, 2009). Environmental goods and services are those produced for the purpose of environmental protection, i.e. the prevention, reduction and elimination of pollution and any other degradation of the environment, as well as the management of resources, i.e. the conservation and maintenance of the stock of natural resources and therefore the protection against depletion (EU Regulation no. 538/2014).

The increased awareness of the need to combat environmental pollution and conserve natural resources has led to an increase in the supply and demand

for environmental goods and services (Broniewicz, 2016). There is a clear international requirement to measure progress towards a green economy and, in this regard, to understand the contribution of the environmental goods and services sector to economic growth (Livesey, 2010).

The provision of goods and services to reduce pollution or manage environmental resources has largely become the main activity of specialized private firms (Sinclair-Desgagné, 2008). The global market for environmental goods and services is expected to rise to US$ 1.9 trillion by 2020 (Blazejczak et al., 2009).

The transition to an ecological economy is also due to the growth of the markets for environmental goods and services. And the sector can reveal other potential opportunities and challenges in this sector (ITC, 2014). Georgeson & Maslin (2019), suggest that countries should consider developing energy, environmental and educational policies relevant to the green economy, in order to remain competitive in these areas.

Economic variables in the environmental sector are reported according to their relevant environmental domain. Thus, environmental protection activities are divided into environmental domains using the Eurostat classification (2016):

- The Classification of Environmental Protection Activities (CEPA 2000): 1. Protection of ambient air and climate, 2. Wastewater management, 3. Waste management, 4. Protection and remediation of soil, groundwater and surface water, 5. Noise and vibration abatement, 6. Protection of biodiversity and landscapes, 7. Protection against radiation, 8. Research and development (R&D), 9. Other environmental protection activities
- The Classification of resource management activities (CReMA): 10. Management of water, 11. Management of forest resources, 12. Management of wild flora and fauna, 13. Management of energy resources, of which: 13A. Production of energy from renewable sources, 13B. Heat/Energy saving and management, 13C. Minimisation of the use of fossil resources as raw materials, 14. Management of minerals, 15. Research and development activities for resource management, 16. Other resource management activities

The Statistical Classification of Economic Activities in the European Community, Rev. 2 (2008) (NACE Rev. 2) is the standard to report data by industries. Compiling and reporting EGSS data broken down by NACE is a fundamental condition for comparability of the EGSS accounts with other statistical systems such as national accounts (Eurostat, 2016). The activities of national economy are: A - Agriculture, forestry and fishing, B - Extractive industry manufacturing industry, C - Manufacturing industry, D - Production and supply of electric and thermal energy, gases, hot water and air conditioning, E - Water supply, sewerage, waste management and remediation activities, F - Construction, H - Transport and storage, public administration and defence; social insurance from the public system.

The interest of economic agents for ecological concerns has increased. The role of the environmental protection sector as a sector producing goods and services results from factors that influence the environmental economy such as: the positive evolution of environmental expenditure, increased investments, the employed labour force (Camasoiu, 1992).

The assessment of the economic and employment impact of the EGSS can be considered an effective way of measuring progress in greening the economy (Zhou et Moinuddin, 2015).

3. Research Questions / Aims of the Research

Given the global awareness of the importance of environmental sustainability, the demand for environmental goods and services has grown rapidly. The purpose of the paper was to present an overview of the market for environmental goods and services in Romania. The study aims to draw attention to the impact of raising awareness, regulation and enforcement of environmental laws. Thus, the paper helps estimating the share of ecological economic activities and benefits to the economy through added value, employment and exports. The analysis of these variables will help in understanding some aspects of the environmental goods and services sector, such as the growth potential, the potential for the labour market through jobs, export development, the efficiency of the sector.

4. Research Methods

The environmental goods and services sector (EGSS) is considering the development of statistical indicators in the field of environmental protection, but also of resource management. Thus, the economic variables studied for the presentation of the performances in the field were the output value, the turnover, the number of employees and exports. Their analysis will provide information on the main areas of specialization for environmental producers. Data were taken from existing official statistics such as the National Institute of Statistics. The data are presented from 2014 to the last available year. To determine how important the goods and services sector is, a Pearson correlation was made between the variables output value and exports. To establish the connection between the two variables, it was performed an analysis using the SPSS software version 20.

5. Findings

The value of production is the value in basic prices of environmental goods and services available for use outside the production unit or for its own final consumption and environmental goods that remain in stock at the end of the period in which they are produced (NIS, 2010).

Figure 1 presents the value of production by activities of the national economy.

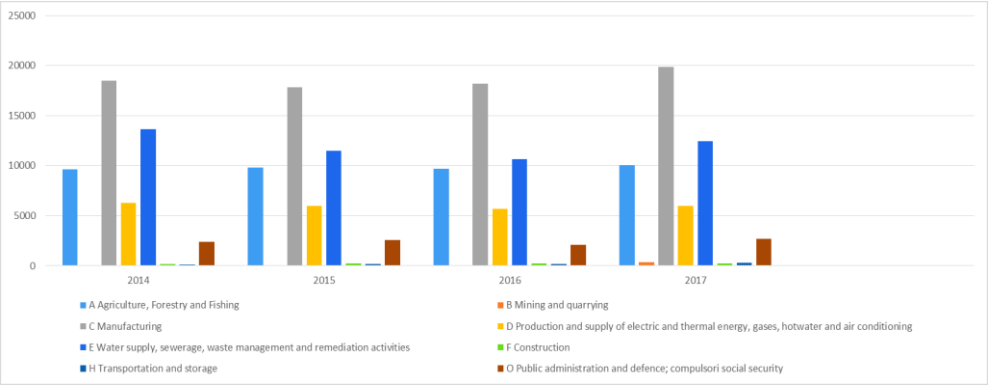

Figure 1. Output value by activities of the national economy (million RON)
Source: NIS, accessed on 15.07.2020

It is found that in each year of the analysed period, the highest values were recorded in the case of the activity C - manufacturing. These are followed by E - water supply, sewerage, waste management and remediation activities. These industries are important for the national economy and contribute to the well-being of the nation. The fact that the output from the activity E is high, demonstrates Romania's interest in the environmental sector and that the country is making efforts in this regard.

The environmental sector is one of global interest. In order to determine the importance of this sector in the activities of the national economy, it was determined the share of environmental services in the total activities (figure 2). Thus, it is found that from the total value of the EGSS in the total activities of the national economy, those from activity E represent approximately a quarter.

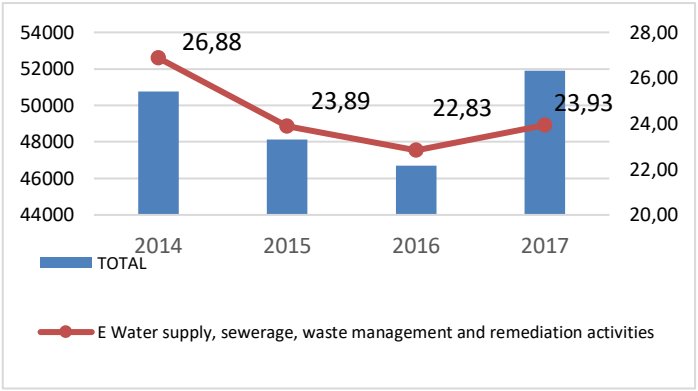

Figure 2. Share of output value of the activity E in the total value of the activities
Source: NIS, accessed on 15.07.2020

The value of production of the environmental goods and services sector by environmental domains is presented in fig. 3.

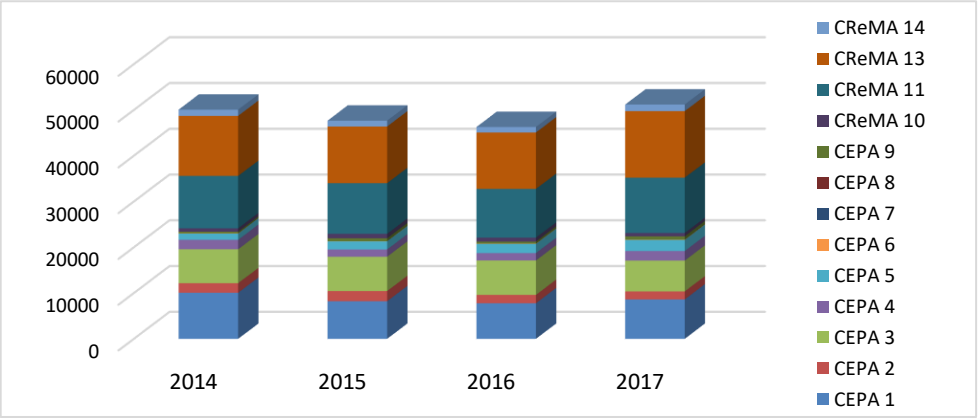

Figure 3. Output value of the environmental goods and services sector by environmental domains (million RON)
Source: NIS, accessed on 15.07.2020

Thus, the highest proportions are found in the case of CEPA 1, CEPA 3, and the largest resources are held by CReMA 11 and CReMA 13. In the analysed period, their value was constant in almost all areas of the environment.

Regarding the total value of production from all activities, this can be found in figure 4. The largest share is held by the management activities - CReMA. They have an upward trend, increasing by approximately RON 2 million. In the case of environmental protection services CEPA, a slight decrease is noticed in the analysed period.

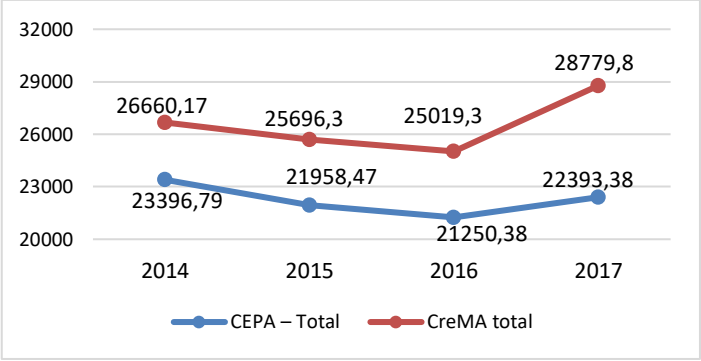

Figure 4. Output value of the activity E by environmental domains - million RON
Source: NIS, accessed on 15.07.2020

Employment is measured in full-time equivalents (FTE) and is the number of full-time equivalent jobs, defined as total hours worked divided by average annual hours worked in full-time jobs (Broniewicz, 2016). The EGS sector employs an increasing proportion of the global workforce (NSW Government, 2019). The growing share of the EGSS in employment (and GDP) reflects the transition to an

economy that aims to reduce the pressure on the environment and natural resources and contributes to reducing unemployment.

In the European Union (EU), the output-GDP ratio of the EGS sector increased by almost two percentage points between 2000 and 2014 (Eurostat, 2018) and created over one million new full-time equivalent jobs (NSW Government, 2019).

EGGS employment in Romania decreased from 190,883.81 FTE in 2014 to 159,542.69 FTE in 2017, meaning a decrease by 16% (figure 5). Regarding the employment in activity E, the trend is also a downward one, the decrease being significant, from 73,659.1 FTE in 2014 to 46,653.64 FTE, i.e. 36% in 2017.

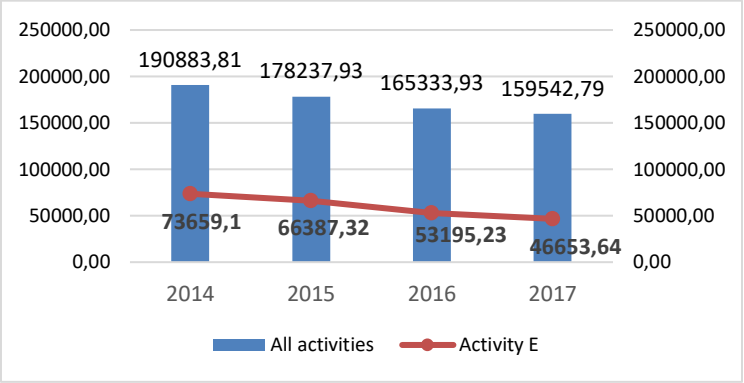

Figure 5. Population employed in all activities of the national economy and in activity E (FTE)

Source: NIS, accessed on 15.07.2020

Regarding the total exports of environmental goods and services from all activities of the economy, they are represented in figure 6. Thus, in 2017 there is an increase in these exports, after in previous years it registered lower values. The percentage increase is 6% in 2017 compared to 2014.

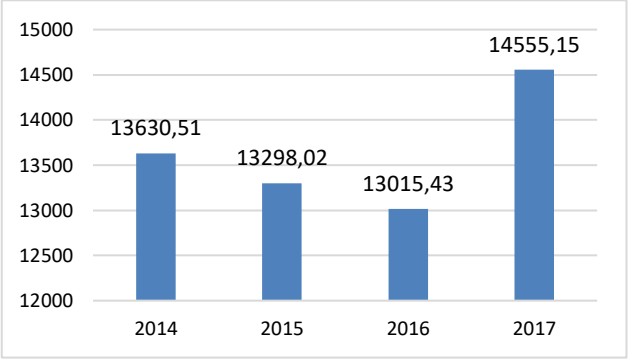

Figure 6. Total exports of environmental goods and services (million RON)

Source: NIS accessed on 15.07.2020

As other authors have found, in Romania the goods and services of environmental production are the main exported products (Broniewicz, 2016).

The challenges in the environmental goods and services sector are closely related as well to the well-being of a country. Thus, a correlation was made to determine the link between output value and exports. It was started from the hypothesis that this correlation is a positive one. To test the hypothesis, the Pearson correlation was performed. The correlation is positive and strong, the Pearson correlation coefficient is 0.922 (Table 1.). The high level of this coefficient reveals the close connection between the two variables. The relationship between the two is directly proportional. Therefore, the higher the output value of goods and services, the higher the exports and vice versa.

Table 1. Pearson Correlation between output value and exports

		Output	**Exports**
Output	Pearson Correlation	1	.922*
	Sig (1-tailed)		.039
	N	4	4
Exports	Pearson Correlation	.922*	1
	Sig (1-tailed)		
	N	.039	4
		4	

*Correlation is significant at the 0.05 level (1-tailed)

6. Conclusions

From this study, it can be concluded that in Romania, in the period 2014-2017 the value of production increased and employment decreased. However, the increase in output value of EGS also generated an increase in exports. A better understanding of this rapidly and dynamic changing sector could open up new opportunities for both employment and exports and could make greater contributions to the national economy. The EGS sector is one which can be innovated both in research and in industry through new products, "cleaner" technologies, investments in infrastructure and incentives for research and development, but also through newly created jobs. Also, it can represent a growing competitive advantage for developing countries. In the EGS sector, the challenge is represented by the fact that the development of this sector depends on the efficient exploitation of the natural and human capital so as to ensure to Romania a sustainable economic growth, a balance between environment and nature. Romania is aware of the potential of the environmental goods and services sector and is making efforts to improve it because this sector can be an important pillar in the development of green economy.

References

[1] Blazejczak, J., Braun, F., & Edler, D. (2009). Global Demand for Environmental Goods and Services on the Rise: Good Growth Opportunities for German Suppliers. German Institute for Economic Research: *Weekly Report*, Sept. 3, 5(20), pp. 138-143.

[2] Broniewicz, E. (2016). Environmental goods and services sector, 9th International Scientific Conference *Business and Management 2016*.

[3] Camasoiu, C. (1992). Protecția mediului inconjurător, sector al producției de bunuri și servicii, *Romanian Journal of Economics*, Institute of National Economy, 2(1-2(2), pp. 119-122.

[4] Sinclair-Desgagné B. (2008). The Environmental Goods and Services Industry, *International Review of Environmental and Resource Economics* 2(1), pp. 69-99.

[5] Frone, S. (2012). Lucrarea de cercetare postdoctorală *Investițiile în Infrastructura de Mediu: Cerințe si Oportunități de Dezvoltare Economică Durabilă a României*.

[6] Georgeson, L., & Maslin, M. (2019). Estimating the scale of the US green economy within the global context. *Palgrave Commun* 5, p. 121.

[7] ITC (2014). International Trade Centre, Trade In Environmental Goods And Services: Opportunities And Challenges, Geneva: ITC. v, 35p. (*Technical Paper*) Doc. No. DMD-14-255.

[8] Livesey, D. (2010). Measuring the environmental goods and services sector, *Economic & Labour Market Review*, 4, pp. 45-58.

[9] NSW Government (2019). *Innovation and Productivity Council*, Innovation in the NSW environmental goods and services sector.

[10] OECD/Eurostat. (1999). The Environmental Goods and Services Industry: *Manual for Data Collection and Analysis*, OECD Publishing, Paris, https://doi.org/10.1787 /9789264173651-en.

[11] Regulation EU No 538/2014 of the European Parliament and of the Council of 16 April 2014 amending Regulation (EU) No 691/2011 on *European environmental economic accounts Text with EEA relevance* (2014), Dz.U. L 158 z 27.5.2014.

[12] Rosiek, K. (2017). Environmental Goods and Services Sector Accounts – *First Statistics, Ekonomia I*, Środowisko, 2(61), pp. 43-56.

[13] Summers, J., Smith, K., Richard, L. M, Fulford S., & Crespo, R. J. (2018). The Role of Ecosystem Services in Community Well-Being. *Ecosystem Services and Global Ecology* , Chapter 8, pp. 145-166.

[14] UNEP (2012). https://www.greengrowthknowledge.org/sites/default/files/downloads/ resource/Measuring_progress_towards_an_inclusive_GE_UNEP.pdf.

[15] Zhou, X., Moinuddin, M. (2015). Economic and Employment Impact Assessment of Green Investment: A case study on Environmental Goods and Services Sector (EGSS) in Japan, *IGES Working Paper*.

[16] Eurostat, The Environmental Goods and Services Sector, *A Data Collection Handbook*, (2009).

[17] Eurostat (2016). Environmental goods and services sector accounts – *Handbook*.

[18] Eurostat (2018). 'Environmental economy – statistics', https://ec.europa.eu/eurostat/ statistics-explained/ index.php?title=Environmental_economy_-_statistics; Eurostat (2018) 'Environmental economy – statistics on employment and growth'.

[19] Eurostat (2019). http: // ec. europa. eu/ eurostat/ statistics-explained/ index. php/ Environmental_ accounts: _Establishing_ the_ links_ between_ the_ environment_ and_ the_ economy.

[20] NIS (2010). *Conturile de mediu sectorul bunurilor şi serviciilor de mediu*.

[21] NIS (2020). http://statistici.insse.ro:8077/tempo-online/, accessed 15.07.2020.

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Main Determinants of Agriculture in Romania during the Implementation of the National Rural Development Programme 2007-2013

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Abstract

Through the measures of the National Rural Development Programme (NRDP), Romania has the chance to develop its agricultural sector. The paper focuses on the results of the implemented National Rural Development Programme 2007-2013, with regard to the development of the agricultural sector from Romania. The data was analysed at the level of the regions of Romania, for the period of implementation of the National Rural Development Programme 2007-2013. The data included indices covering different dimensions of agricultural development in Romania, based on their availability on the website of the National Institute of Statistics in Romania: Land fund; Material and technical base of agriculture; Area and production of crops; Livestock and animal agricultural production; Economic accounts in agriculture; Agri-environment indicators.

Keywords: Agriculture, National Rural Development Programme, Common Agricultural Policy, rural development, sustainability.

JEL Classification: Q10, Q14, Q13

1. Introduction

Through the measures of the National Rural Development Programme (NRDP), Romania had the chance to develop its agricultural sector. The European Agricultural Guarantee Fund finances the measures to regulate and support the agricultural markets and also the direct payments to farmers. The European Agricultural Fund for Rural Development finances the national rural development programmes (AFIR, accessed 01.09.2020).

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The main objectives of the National Rural Development Programme 2007-2013 in Romania were (AFIR accessed 01.09.2020; AFIR PNDR, accessed 01.09.2020):

- Increasing the Competitiveness of the agricultural and forestry sector (Axis 1) by strengthening the potential of large areas of land, suitable for agriculture; renewing the generations of farm managers through education and training; supporting the establishment of producer groups; facilitating the modernization of small enterprises in the agri-food and forestry processing sector, through the following measures: Setting-up of young farmers; Modernization of agricultural holdings; Supporting semi-subsistence farms; Improving and developing infrastructure related to the development and adaptation of agriculture and forestry.
- Improving the environment and rural areas (Axis II) by the sustainable use of natural resources; reducing the risk of abandonment of agricultural activities in disadvantaged agricultural areas; providing financial support to farmers and forest owners for the provision of environmental protection services for the protection of wild flora and fauna, water and soil; providing financial support for the improvement of animal welfare standards in swine farms; diversifying the activities of the farms; rising the information level of farmers in agricultural field, through the following measures: Agri-environment payments; Animal welfare payments.
- Improving the quality of life (Axis III) by raising the attractiveness of the rural areas, through the following measures: Support for the creation and development of micro-enterprises; Encouraging tourism activities; Renovation, development of villages, improvement of basic services for the economy and the rural population and enhancement of the rural heritage.
- Improving local governance and promoting the endogenous potential of rural space (Axis IV), through Local development strategies and Cooperation projects.

Romania also received a supplementary financing through the European Economic Recovery Plan for activities from the National Strategic Plan (AFIR PNDR, accessed 02.09.2020):

- Improving the efficiency of the use of nitrogen fertilizers;
- Improving the support for investments in dairy production and processing;
- Stimulating the use of wastewater treatment and water saving equipment in agricultural holdings;
- Stimulating the processing of agricultural/forestry biomass for renewable energy;
- Maintaining biodiversity and preserving the agricultural lands threatened by abandonment or intensification.

2. Problem Statement

Several researchers analysed the distribution of rural development funds for the field of Common Agricultural Policy (Kiryluk-Dryjska, Beba and Poczta, 2019;

Noack and Schuler, 2020; Balezentis et al., 2020) in relation to several dimensions: spatial implications, ecosystem services, young farmers support. Other researchers tried to measure the relation between expenditures for natural capital and territorial needs (Zasada et al., 2018). Slee and Feliciano (2015) focused on the use of impact indicators related to climate change in the Rural Development Programme 2007-2013.

The paper focuses on the results of the National Rural Development Programme 2007-2013 with regard to the development of the agricultural sector in Romania. According to the reports of the Agency for Financing Rural Investments, the percentage of absorption of the European funds was over 86% from EUR 5,72 billion allocated to Romania to finance investment projects, by the European Union, through the National Rural Development Programme 2007-2013 (AFIR PNDR, accessed 01.09.2020).

Agriculture is an important economic factor; the largest part of Romania's land fund is agricultural land. In Romania, the total land fund did not register important variations during the analysed period (2007-2013). Thus, at the level of the year 2013, the total land fund was divided as follows: agricultural land (14,611,883 ha), arable land (9,389,254 ha), total non-agricultural land (9,227,188 ha), forests and other forest vegetation (6,742,056 ha), grazing land (3,273,961 ha), meadow (1,541,854 ha), land with water (835,997 ha), land with construction (758,303 ha), degraded and non-productive land (500,937 ha), communication and railways (389,895 ha), vines and vineyards (210,270 ha), orchards (196,544 ha) (Figure 1).

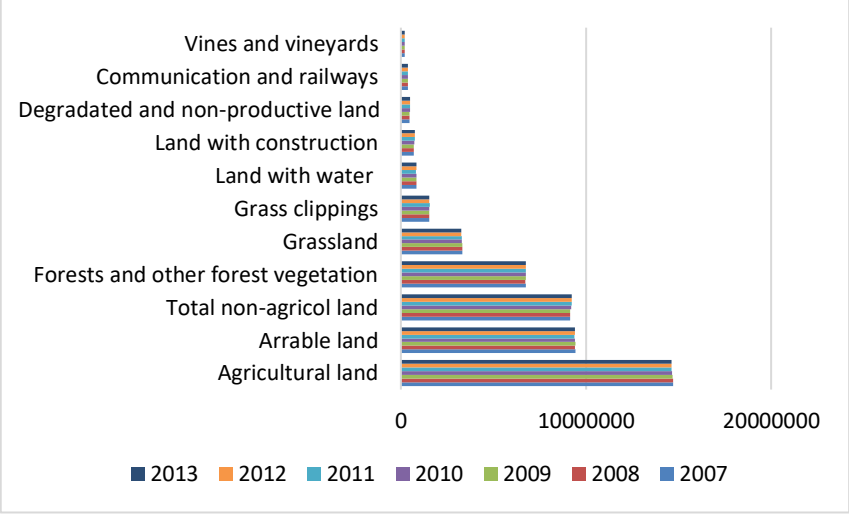

Figure 1. Total land fund (2007-2013)
Source: INSSE, accessed 01.10.2020

The number of persons employed in Agriculture, forestry and fisheries decreased in 2013, compared to 2007. Thus, there were 125,482 persons employed in Agriculture, forestry and fisheries in 2007, compared to 103,813 persons

employed in the same industry in 2013 (Figure 2) Moreover, Romania experiences a decrease in the number of rural population on the one hand and, on the other hand, the remaining population from the rural area is very old, while the qualified youth left the rural areas. The increase in older people is of 2.6% per year, "faster than the annual increase in the total population, which is 1.2% per year" (Cristea et al., 2016). Marcu et al. (2015) also analysed "the duality of employment-unemployment within the dynamics of the Romanian labour market".

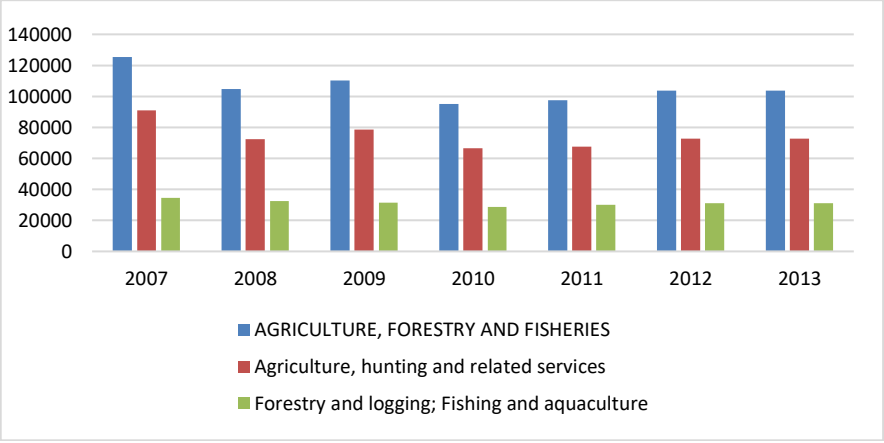

Figure 2. Workforce in Agriculture, forestry and fisheries
Source: INSSE, accessed 01.10.2020

3. Research Questions / Aims of the Research

The data was analysed at the level of the regions of Romania: North-Western Region; Central Region; North-Eastern Region; South-Eastern Region; South-Muntenia Region; Bucharest-Ilfov Region; South-Western Oltenia Region; Western Region, for the period of the implementation of the National Rural Development Programme 2007-2013.

Firstly, the data included indexes covering different dimensions of agricultural development in Romania, based on the available data for the period 2007-2013 on the website of the National Institute of Statistics in Romania (INSSE, accessed 1.09.2020):

- Land fund
- Material and technical base of agriculture;
- Area and production of crops;
- Livestock and animal agricultural production;
- Economic accounts in agriculture;
- Agri-environment indicators.

The uncorrelated variables were deleted, thus 7 independent predictors remaining for our analysis (Table 1).

Table 1. Agricultural development variables

	Variables	Code
Material and technical base of agriculture	Tractors (units)	(V_t)
	Tractor plows (units)	(V_tp)
Area and production of crops	Crops (hectares)	(V_c)
Livestock and animal agricultural production	Animals (units)	(V_a)
	Swine (units)	(V_s)
Agri-environment indicators	Chemical fertilizers (tones 100% active substance)	(V_cf)
	Nitrogenous fertilizers (tones 100% active substance)	(V_nf)

Source: Authors' own interpretation

Secondly, the main items of agriculture in Romania were determined using the factor analysis, for the period of implementation of the National Rural Development Programme 2007-2013.

4. Research Methods

The correlation table (Table 2) reveals that all variables are correlated (Pearson coefficient > 0,45), underlying that they are measuring the same phenomenon: agricultural development.

Table 2. Correlations

	V_t	V_c	V_cf	V_tp	V_s	V_nf	V_a
	1	0.560**	0.740**	0.995**	0.823**	0.703**	0.515**
V_t		0.000	0.000	0.000	0.000	0.000	0.000
		56	56	56	56	56	56
		1	0.770**	0.598**	0.748**	0.813**	0.323*
V_c			0.000	0.000	0.000	0.000	0.015
			56	56	56	56	56
			1	0.744**	0.750**	0.957**	.493**
V_cf				.000	.000	.000	.000
				56	56	56	56
				1	.834**	.716**	.524**
V_tp					.000	.000	.000
					56	56	56
					1	.741**	.473**
V_s						.000	.000
						56	56
						1	.403**
V_nf							.002
							56
							1
V_a							
							56

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Authors' interpretation based on SPSS Software

Factor analysis is used in order to reduce the number of variables to a set of factors representative for agricultural development. The KMO value of 0.764 represents acceptable factor solutions. The KMO test measures the existence of a common variance between the variables. Its value has to be higher than 0.5 (Table 3).

Table 3. KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.764
Bartlett's Test of Sphericity	Approx. Chi-Square	577,620
	df	15
	Sig.	0.000

Source: Authors' interpretation based on SPSS Software

According to the data from Table 4, the retained variables are part of the final factor solution (AFIR PNDR, accessed 10.10.2020):

- Tractors (0.806) and Tractor plows (0,827). Romania's smaller farms could improve the acquisition of new and performant equipment.
- Crops (0.688). Romania has important land fund that could be transformed in agricultural land, favourable for crop planting and also diversification of crops.
- Swine (0.827). Romania could improve the technological measures for animal welfare, favourable to environment improvement and farm development.
- Chemical fertilizers (0.850). Due to the modernization of agricultural holdings and the important demand in agriculture, chemical fertilizers were used and sometimes, they were used in excess (increased pesticide consumption). In the Axis II there were measures for reducing the usage of chemical substances in agriculture (eliminating chemical fertilizers, moving towards an ecological agriculture).
- Nitrogen fertilizers (0.838). Romania could improve the efficiency in the use of nitrogen fertilizers, by the best practices in agricultural holdings management, with positive effects on the environment.

Table 4. Communalities

	Initial	**Extraction**
Tractors (units)	1.000	0.806
Crops (hectares)	1.000	0.688
Chemical fertilizers (tones 100% active substance)	1.000	0.850
Tractor plows (units)	1.000	0.827
Swine (units)	1.000	0.827
Nitrogenous fertilizers (tones 100% active substance)	1.000	0.838

Extraction Method: Principal Component Analysis.

Source: Authors' interpretation based on SPSS Software

The retained factor solution explains 80.605% of the total variance (Table 5).

Table 5. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.836	80.605	80.605	4.836	80.605	80.605
2	.680	11.335	91.941			
3	.309	5.157	97.097			
4	.132	2.198	99.295			
5	.039	.656	99.951			
6	.003	.049	100.000			
Extraction Method: Principal Component Analysis.						

Source: Authors' interpretation based on SPSS Software

Cronbach's Alpha coefficient is 0.533, which is above the requested minimum limit of 0.5. The model has an acceptable internal coherence (Table 6).

Table 6. Reliability Statistics

Cronbach's Alpha	N of Items
0.533	6

Source: Authors' interpretation based on SPSS Software

5. Conclusion

With the use of factor analysis, we determined five main items of agriculture development in Romania for the analysed period (2007-2013) (Figure 3):

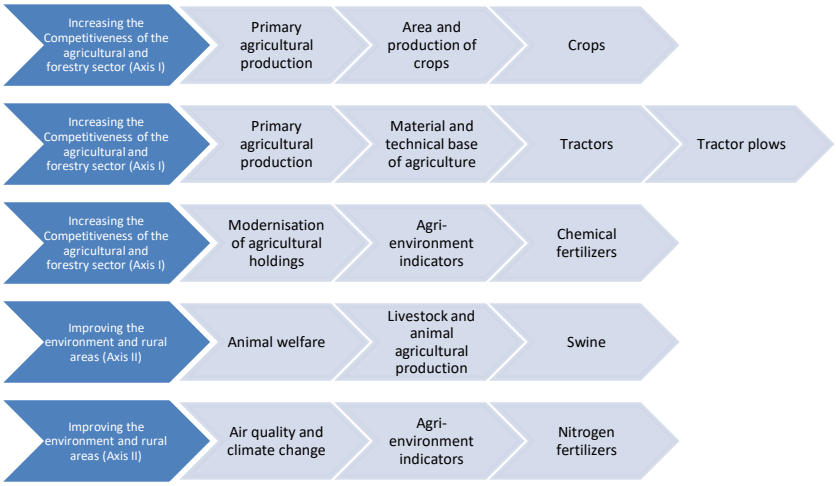

Figure 3. Items of agriculture development in Romania
Source: Adapted by the authors

To ensure continuity in the development of agricultural sector, the Common Agricultural Policy (CAP) 2021-2027 has the following objectives: "increase competitiveness"; "ensure fair income"; "protect food and health quality"; "vibrant rural areas"; "support generational renewal"'; "preserve landscapes and biodiversity"; "environmental care"; "climate change action"; "rebalance power in food chain". (CAP, accessed 20.08.2020)

References

[1] Balezentis, T., Ribasauskiene, E., Morkunas, M., Volkov, A., Streimikiene, D., & Toma, P. (2020). Young farmers' support under the Common Agricultural Policy and sustainability of rural regions: Evidence from Lithuania. *Land Unse Policy*, 94, pp. 504-542.

[2] Cristea, M., Marcu, N., & Cercelaru, O.-V. (2016). Longer life with worsening pension system? Aging population impact on the pension system in two countries: Romania and Croatia. *Economic and Social Development: Book of Proceedings*, p. 28.

[3] Kiryluk-Dryjska, E., Beba, P., & Poczta, W. (2020). Local determinants of the Common Agricultural Policy rural development funds' distribution in Poland and their spatial implications. *Journal of Rural Studies.*

[4] Marcu, N., Meghisan, G.-M., & Ciobanu, M.-C. (2015). Research on Romanian labour market dynamics. *Revista de chimie*, 66(9), pp. 1540-1544.

[5] Noack., E. M., & Schuler, S. (2020). Rural development and human well-being: Do pillar-II-programmes take into account ecosystem services? A study in Lower Saxony, Germany. *Environmental Science and Policy*, 106, pp. 191-200.

[6] Slee, B., & Feliciano, D. (2015). Challenges in the design of indicators for assessing the impact of the Scotland Rural Development Programme 2007-2013 on climate change mitigation. *Ecological Indicators*, 59, pp. 94-103.

[7] Zasada., I., Weltin, M., Reutter, M., Verburg, P. H., & Piorr, A. (2018). EU's rural development policy at the regional level - Are expenditures for natural capital linked with territorial needs?. *Land Use Policy*, 77, pp. 344-353.

[8] *** https://www.afir.info, accessed 01.09.2020.

[9] *** https://portal.afir.info/informatii_generale_pndr_pndr_2007_2013?amp;lang=RO, accessed 01.09.2020.

[10] *** https://portal.afir.info/Uploads/PNDR/2007-2013/PNDR_2007-2013_v16.pdf, accessed 02.09.2020.

[11] *** (https://portal.afir.info/informatii_generale_pndr_pndr_2007_2013?amp;lang=RO, accessed 01.09.2020.

[12] *** http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, accessed 01.10.2020.

[13] https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en, accessed 20.08.2020.

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Food Trade between China and Romania: Before and After the COVID-19 Pandemic

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Abstract

Over the past decade, the trade turnover between China and Romania has more than doubled, but food and agricultural products still occupy a fairly modest portion of trade between the two countries. There are significant prerequisites for the development of food trade, since Romania possesses competitive advantages in the production of certain types of agricultural products, while China is the world's largest food importer. However, in the times of the COVID-19 outbreak, global markets have been hit by the economic downturn and the disruption of supply chains. Due to the emergency of the health crisis, the influences of market volatilities stemmed from the pandemic on food trade have been poorly explored. This paper attempts to investigate contemporary tendencies in China-Romania bilateral trade in food by analysing the dynamics and composition of trade in 2009-2018, revealing competitive advantages of both China and Romania in trade in major food products, and estimating potential effects of the economic recession stemmed from the COVID-19 health crisis on bilateral China-Romania trade in food and agricultural products.

Keywords: China, COVID-19, export, food products, import, Romania, trade.

JEL Classification: Q17, F17

1. Introduction

Today, China is the world's largest importer of food and agricultural products. Largely due to abundant imports, the country has succeeded to ensure a high level of food security for its population. The countries of Eastern Europe have been increasingly exploring China's large and receptive market by supplying various types of high-quality food with high added value, as well as agricultural raw materials.

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Among Eastern European economies, Romania is one of the biggest agricultural producers. Trade relations between Romania and China are developing, not so much due to agricultural products, as due to the import of certain types of equipment and technological products from China. Nevertheless, many scholars, for instance, Drăgoi et al. (2018), Andrei et al. (2017), Niculae and Costaiche (2016), and Neculita et al. (2011), among others, note substantial comparative advantages of Romania in the production and supply of food to the global market, including to China.

Many trade development perspectives, however, have been aggravated by the most recent outbreak of COVID-19. In terms of sustainable supply of food, the pandemic crisis has become a global economic challenge. According to Welsh (2020), the COVID-19 crisis influences supply of food and agricultural products by violating global logistics chains. It also degrades the living standards of the population, reduces purchasing power, decreases production capacities of the agricultural sector, and disrupts distribution of food. Since the beginning of 2020, many governments have introduced restrictions on export of various kinds of food products and agricultural raw materials. These protectionist measures could provoke food shortages and create volatilities in the global food market, as it happened in 2007-2008 during the financial crisis. Headey (2011) and Martin and Anderson (2011) found that in that time, food trade regulations fuelled the growth of prices for soya, rice, and cereals. In some countries, the attempts to decrease shortages in food supply resulted in the disruption of the delivery and distribution chains.

Being dependent on agricultural imports, China is particularly vulnerable to such distortions of supply that could increase food insecurity in the domestic market. In an attempt to sustain its food supply channels, China has been looking for the diversification of suppliers in the global food market. Romania could use its agricultural potential to increase the portion in food delivery to China, but the potential impacts of COVID-19 pandemic on food trade between the two countries require comprehensive assessment.

2. Problem Statement

Trade aspects of food security have been widely discussed in the literature, but the role of trade in ensuring food supply has been questioned. While Wegren and Elvestad (2018) and Clapp (2017), among others, argue that trade contributes to establishing the adequate availability of food on the domestic market, there have been studies that approach the understanding of food security from the position of agricultural production (Smith et al., 2000), economy (Timmer, 2000), or health (Toffolutti et al., 2020). Nevertheless, the emergence of trade-related issues of demand gaps and food price surges during the global crises suggest that trade plays an important role in ensuring food security. There are evidences of how trade restrictions have triggered food inflation during the food crises since the 1970s (Johnson, 1975; Ivanic and Martin, 2008; Timmer, 2010). Anderson and Nelgen (2012), Abbott (2011), and Rude and An (2015) also found that trade policies might aggravate food insecurity. Bakalis et al. (2020), Petersen et al. (2020), and Bhunnoo

(2019) found that the outbreaks of SARS, MERS, Ebola, and avian influenza had a negative effect on food supply throughout the world.

Regarding COVID-19, there have been preliminary estimations of how the pandemic could influence food supply globally. They were performed by the Food and Agriculture Organization of the United Nations, World Food Programme, United Nations Commission on Trade and Development, World Health Organization, and International Food Policy Research Institute. Despite the fact that the effects of the COVID-19 outbreak have been roughly assessed for most countries of the world in terms of trade and consumption of food and agricultural products, as well as major agricultural inputs (Erokhin and Gao, 2020), none of the reports have particularly addressed the trends in food trade between China and Romania.

Thus, it is worthwhile to say that trade impacts of the COVID-19 pandemic on the distribution of food have been explored insufficiently. Many of the studies that are appearing today on the wave of the COVID-related research agenda are focusing on the aspects of food safety (Unhale et al., 2020), agriculture productivity (Mikiibi, 2020; Hussein & Greco, 2020), and healthy nutrition (Rahman et al., 2020). The problems of disruptions in food imports in food importing countries and negative trade balance remain underscored. Similar to global trade reports released by various international organizations, there have been no investigations of China-Romania trade in food and agricultural products that would link the perspectives of food trade with COVID-19 economic effects.

3. Aim of the Research

In light of the existing gaps in studying China-Romania trade relations, the current paper aims to analyse the dynamics and composition of food trade between the two countries in the past decade, reveal competitive advantages of both China and Romania in major food products, and estimate potential effects of the global economic recession induced by COVID-19 health crisis on bilateral China-Romania trade in food and agricultural products.

4. Research Methods

China-Romania trade (total trade and food trade) is analysed across an array of parameters, including foreign trade balance, foreign trade turnover, export, import, composition of food export, and composition of food import. Competitive advantages of both China and Romania in food trade are estimated by comparing the volumes of export from China to Romania with those of export from Romania to China. The data for this study are derived from the global database of the United Nations Conference on Trade and Development (UNCTAD, 2020). SITC Commodity classification is used. The total volume of agricultural trade in both exports and imports is generalized as SITC "All food items" (SITC 0+1+22+4). Detailed lists of import and export products are built along 37 positions and include major food and agricultural commodities traded between China and Romania in 2009-2018.

5. Findings

The decade that has passed since the global economic recession in 2008-2009 has turned out to become a period of recovery and growth in trade between China and the countries of Eastern Europe in general, and between China and Romania in particular. Exports from China to Romania grew by 88.6% (from $2.38 billion in 2009 up to $4.48 billion in 2018), while exports from Romania to China skyrocketed fivefold from $433.01 million in 2009 to $2.33 billion in 2018 (Figure 1). Despite some fluctuations in the volume of trade balance in the early 2010s, it has been remaining consistently positive for China throughout a decade. The trade deficit with China is common for all countries of Eastern Europe. In food trade with Romania, however, the deficit has been shrinking since 2011 amid the growing export to China (Figure 2).

The food trade balance is still positive for China, but Romania has succeeded to increase its supplies from only $1.43 million in 2009 to over $29.43 million in 2018. Romania is a big supplier of meat and edible meat offal to China. Its export volume has been increasing steadily since 2010. Other export items include various edible products, cereals and cereals preparations, sweets (Appendix, Table 2). From China, Romania consumes fruits and nuts, vegetables, roots and tubers, various edible products and preparations, fish, molluscs and crustaceans, tea and spices, and oil seeds and oleaginous fruits (Appendix, Table 1).

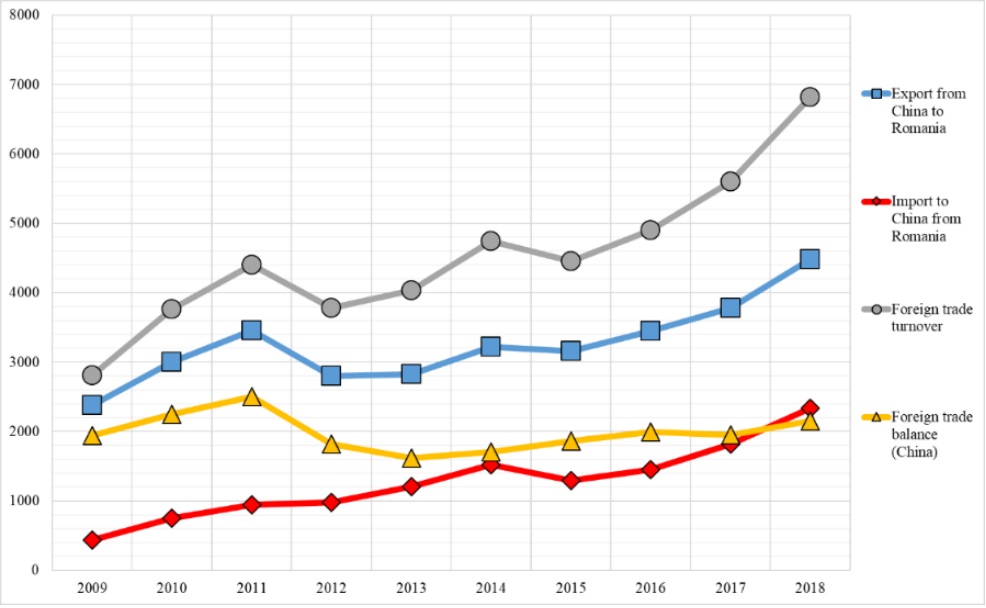

Figure 1. Total trade between China and Romania in 2009-2018, $ million
Source: authors' development based on UNCTAD (2020)

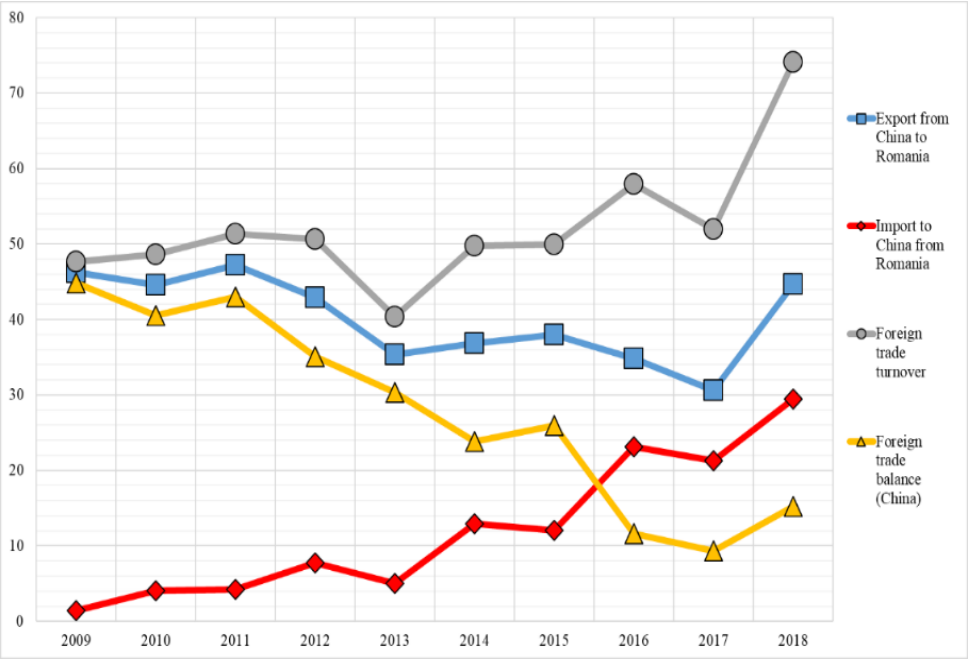

Figure 2. Food trade between China and Romania in 2009-2018, $ million
Source: authors' development based on UNCTAD (2020)

Thus, the analysis revealed positive dynamics in China-Romania trade in food and agricultural products. In a normal situation, one would expect further growth in bilateral trade. However, during the COVID-19 pandemic, food supply chains are affected by many factors. Due to the disruptions of local supply chains, food prices have been increasing at many markets in both Europe and Asia (FAO, 2020). For such countries like Romania (focused on a small range of export products in trade with China), there is also a risk that limited resources concentrated on the production of particular food products would not allow to diversify export (Vos et al., 2020).

To curb the negative impact of the lockdowns, trade restrictions, disrupted supply chains, and economic recession on the food trade balance, both countries should concentrate their resources on producing and supplying the products in which they possess comparative advantages over each other. The analysis of bilateral export volumes allowed the authors to reveal that for Romania, "export competitive" products include beverages and spirits (wine), dairy products (concentrated milk), honey, cereal preparations, and meat products, including edible meat offal (Figure 3).

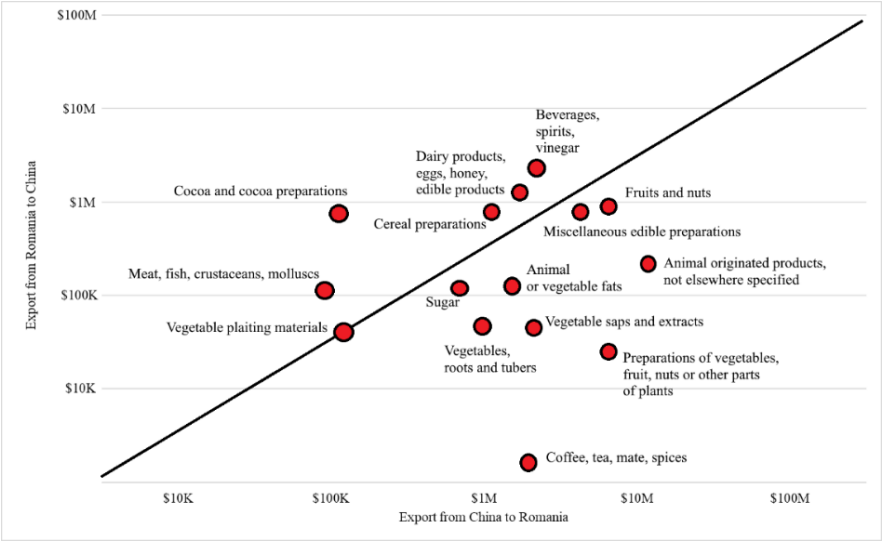

Figure 3. Exports by food and agricultural products between China and Romania in 2018
Source: authors' development based on OEC (2020)

Chinese agricultural producers are particularly competitive in supplying Romanian market with fruits, edible products and preparations, animal fats, vegetables, roots, and tubers, sugar, and traditional Chinese products.

6. Conclusions

This study is a rough attempt to discuss the potential effects of the COVID-19 crisis on food trade between China and Romania. It is revealed that food trade between the two countries has been progressing since the end of the global economic recession of 2008. The food trade balance has remained positive for China. Nevertheless, among the countries of Eastern Europe, Romania has emerged as one of the big suppliers of various food and agricultural products to China. The analysis conducted in this paper demonstrated China's advantages in trade of fruits, vegetables, edible products and preparations, sugar, tea, and spices, and Romania's advantages in the export of beverages, dairy products, cereal preparations, and meat to China.

As trade and economic effects of the spreading of COVID-19 on food security at a global level have been emphasized by many scholars, it is safe to assume that the crisis will affect food trade in terms of lockdowns imposed on domestic economic activities and international exchange, food trade restrictions initiated by some countries, and degrading purchasing power of people and businesses. Potentially, the losses to food trade could be reduced by expanding the supplies of those products in which both countries enjoy competitive advantages in trade. As more comprehensive and recent data on China-Romania food trade become available, authors' assessments should be adjusted. Also, the set of parameters could be

increased to be able to better reflect the influence of food trade on food security in both countries, including such dimensions of food security as stability of supply chains and utilization of agricultural products.

Acknowledgment

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References

[1] Abbott, P. (2011). Export Restrictions as Stabilization Responses to Food Crisis. *American Journal of Agricultural Economics*, 94, pp. 428-434.

[2] Anderson, K., & Nelgen, S. (2012). Trade Barrier Volatility and Agricultural Price Stabilisation. *World Development*, 40, pp. 36-48.

[3] Andrei, J. V., Mieilă, M., & Panait, M. (2017). Transformations of the Romanian Agricultural Paradigm under Domestic Economic Policy Reforms: An Analysis during 1960-2011. *Land Use Policy*, 67, pp. 288-297.

[4] Bakalis, S., Valdramidis, V., Argyropoulos, D., Ahrne, L., Chen, J., Cullen, P., …Van Impe, J. (2020). Perspectives from CO+RE: How COVID-19 Changed Our Food Systems and Food Security Paradigms. *Current Research in Food Science*, 3, pp. 166-172.

[5] Bhunnoo, R. (2019). The Need for a Food-Systems Approach to Policy Making. *Lancet*, 393, pp. 1097-1098.

[6] Clapp, J. (2017). Food Self-Sufficiency: Making Sence of It, and When It Makes Sense. *Food Policy*, 66, pp. 88-96.

[7] Drăgoi, M. C., Andrei, J. V., Mieilă, M., Panait, M., Dobrotă, C. E., & Lădaru, R. G. (2018). Food Safety and Security in Romania – An Econometric Analysis in the Context
of National Agricultural Paradigm Transformation. *Amfiteatru Economic*, 20(47), pp. 134-150.

[8] Erokhin, V., & Gao, T. (2020). Impacts of COVID-19 on Trade and Economic Aspects of Food Security: Evidence from 45 Developing Countries. *International Journal of Environmental Research and Public Health*, 17(16), p. 5775.

[9] Food and Agriculture Organization of the United Nations. (2020). *Novel Coronavirus (COVID-19)*. Retrieved from: http://www.fao.org/2019-ncov/q-and-a/impact-on-food-and-agriculture/en/.

[10] Headey, D. (2011). Rethinking the Global Food Crisis: The Role of Trade Shocks. *Food Policy*, 36, pp. 136-146.

[11] Hussein, H., & Greco, F. (2020). How Will the COVID-19 Pandemic Impact Food Security and Virtual Water "Trade"?. *Future of Food: Journal on Food, Agriculture and Society, 1*. Retrieved from: https://www.thefutureoffoodjournal.com/index.php/FOFJ/article/view/346.

[12] Ivanic, M., & Martin, W. (2008). Implications of Higher Global Food Prices for Poverty in Low-Income Countries. *Agricultural Economics*, 39, pp. 405-416.

[13] Johnson, G. (1975). World Agriculture, Commodity Policy, and Price Variability. *American Journal of Agricultural Economics*, 57(5), pp. 823-828.

[14] Martin, W., & Anderson, K. (2011). *Export Restrictions and Price Insulation during Commodity Price Booms*. Washington, DC: The World Bank.

[15] Mukiibi, E. (2020). COVID-19 and the State of Food Security in Africa. *Agriculture and Human Values*. doi:10.1007/s10460-020-10079-9.

[16] Neculita, M., Sarpe, D. A., Cristea, V., Zhang, X., & Moga, L. M. (2011). Modeling the Impact of Romania's Accession to European Union on Trade of Live Animals. *Journal of Food, Agriculture and Environment*, 9(1), pp. 428-431.

[17] Niculae, I., & Costaiche, G. M. (2016). Study on the Influence of Import and Export of Fruit in Romania on Economic Indicators. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and Rural Development"*, 16(1), pp. 343-354.

[18] Observatory of Economic Complexity. (2020). *Reports*. Retrieved from: https://oec.world/.

[19] Petersen, E., Koopmans, M., Go, U., Hamer, D., Petrosillo, N., Castelli, F., … Simonsen, L. (2020). Comparing SARS-CoV-2 with SARS-CoV and Influenza Pandemics. *The Lancet Infectious Diseases*, 20.

[20] Rahman, S., Hossain, I., Mullick, A. R., & Khan, M. H. (2020). Food Security and the Coronavirus Disease 2019 (COVID-19): A Systemic Review. *Journal of Medical Science and Clinical Research*, 8, pp. 180-184.

[21] Rude, J., & An, H. (2015). Explaining Grain and Oilseed Price Volatility: The Role of Export Restrictions. *Food Policy*, 57, pp. 83-92.

[22] Smith, L. C., El Obeid, A. E., & Jensen, H. H. (2000). The Geography and Causes of Food Insecurity in Developing Countries. *Agricultural Economics*, 22(2), pp. 199-215.

[23] Timmer, C. P. (2000). The Macro Dimensions of Food Security: Economic Growth, Equitable Distribution, and Food Price Stability. *Food Policy*, 25, pp. 283-295.

[24] Timmer, C. P. (2010). Reflections on Food Crises Past. *Food Policy*, 35, pp. 1-11.

[25] Toffolutti, V., Stuckler, D., & McKee, M. (2020). Is the COVID-19 Pandemic Turning into a European Food Crisis? *European Journal of Public Health*, pp. 4-5.

[26] Unhale, S. S., Ansar, Q. B., Gajghane, V., Bharudkar, S. S., Gadekar, P. P., & Biyani, K. R. (2020). Impact of COVID-19 on Food Safety and Food Security. *World Journal of Advance Healthcare Research*, 4, pp. 126-129.

[27] United Nations Conference on Trade and Development. (2020). *Data Center*. Retrieved from: https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en.

[28] Vos, R., Martin, W., & Laborde, D. (2020). *How Much Will Global Poverty Increase Because of COVID-19?* Retrieved from: https://www.ifpri.org/blog/how-much-will-global-poverty-increase-because-covid-19.

[29] Wegren, S. K., & Elvestad, C. (2018). Russia's Food Self-Sufficiency and Food Security: An Assessment. *Post-Communist Economies*, 30, pp. 565-587.

[30] Welsh, C. (2020). Covid-19 and Food Security. Retrieved from: https://www.csis.org/programs/global-food-security-program/covid-19-and-food-security.

[31] World Trade Organization. The COVID-19 Pandemic and Trade-Related Developments in LDCs. Retrieved from: https://www.wto.org/english/tratop_e/covid19_e/ldcs_report_e.pdf.

Appendix

Table 1. Export of major food and agricultural products from China to Romania in 2009-2018, $ million

Products	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Fresh fish	3.06	4.25	5.72	3.85	2.84	2.43	2.03	1.89	1.48	2.50
Vegetables	13.27	8.63	12.86	9.12	7.17	3.65	3.08	2.63	1.34	2.94
Roots, tubers	12.92	14.91	9.72	11.89	7.45	9.65	12.07	10.22	5.55	11.64
Fruits, nuts	4.97	2.05	4.00	3.19	4.35	5.59	10.80	8.97	7.69	12.92
Preserved fruits	2.00	1.96	1.69	1.52	0.79	0.86	0.21	0.60	1.27	0.90
Feeding stuff	0.23	0.33	0.28	0.18	0.25	0.30	0.21	0.48	0.83	0.68
Edible products	1.90	2.25	3.04	3.73	3.61	3.54	2.47	2.24	2.49	3.28
Oil seeds	2.65	3.31	3.13	3.61	4.09	2.00	0.66	0.43	0.71	0.77

Source: authors' development based on UNCTAD (2020)

Table 2. Export of major food and agricultural products from Romania to China in 2009-2018, $ million

Products	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Meat	0.01	0.11	0.32	1.22	0.96	1.04	1.91	14.48	12.36	0.36
Milk	-	-	-	-	-	-	-	0.03	0.40	1.69
Preserved fruits	-	0.11	-	-	0.07	0.43	-	0.14	0.13	0.94
Sugar, honey	-	0.03	0.04	0.19	0.08	0.11	0.49	0.54	0.19	0.05
Chocolate	-	0.06	0.24	0.51	0.54	0.61	0.79	0.75	0.61	0.71
Edible products	0.01	0.01	0.03	-	0.05	0.06	0.05	0.07	0.37	1.45
Non-alcoholic beverages	-	0.01	0.02	0.07	0.11	0.23	0.25	0.11	0.08	0.06
Alcoholic beverages	1.15	2.94	3.12	3.86	3.09	4.04	4.06	3.38	3.37	3.21

Source: authors' development based on UNCTAD (2020)

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Impact of Seasonality of Fruit Production on Trade Balance and Prices

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Abstract

In the agricultural sector, seasonality is a very important character, and in Romania, often with a negative impact on the branch. On the fruit sector, the negative impact is significantly greater, given that this character is also doubled by the high perishability of fruits. Thus, this paper aims to determine the impact that this character, specific to the sector, has on the trade balance and on the prices charged. In the first part of the research, a quarterly analysis of the evolution of the trade balance will be performed, to determine the differences between the quarter in which the fruits are produced in Romania and the rest of the quarters, and later a linear regression analysis will be performed to determine the influence of trade balance evolution on prices.

Keywords: fruit, impact, prices, seasonality, trade balance.

JEL Classification: Q11, Q17, Q13

1. Introduction

Seasonality in the agricultural sector is an issue it faces, especially for perishable, difficult or expensive to store products. Fruits fall into this category. In this study, we want to analyse whether the seasonality of fruit production influences the trade balance, and subsequently the price of their capitalization.

Zbancă and Baltag (2018) developed a study on the fruit sector in the Republic of Moldova, which can be somewhat compared with that in Romania, they argue that the development of the horticultural sector is a practical way to modernize and diversify agriculture and also a source of income in rural areas.

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According to Valpiani et al. (2015), who studied the effect of seasonality on fruit and vegetable availability and store prices in North Carolina, found that "*outside the local harvest season, the availability of many fruits and vegetables was substantially lower at farmers' markets and roadside stands compared to supermarkets.*"

2. Problem Statement

According to the Ministry of Agriculture and Rural Development, which developed the "National Strategy for Operational Programmes in the Fruit and Vegetable Sector" (2017), the statement that the seasonality of vegetable and fruit products induces changes in population consumption is supported. There are products with different degrees of seasonality that intervene on the market at the time of their appearance, for short periods of time. In this respect, it can be stated that the supply of vegetables / fruits, especially of perishable ones, is rigid and is represented by the entire quantity of products harvested in a period which, as a rule, corresponds to the type of maturation of those products.

In another research, conducted by Movileanu and Botezatu (2010), are presented the peculiarities of vegetable and fruit markets, one of these features is described as the high degree of seasonality, which determines a non-uniform supply of products and requires an operative management of product quantities according to consumer demand.

Considering the other researches carried out previously, regarding the seasonality, it is the hypothesis of the research of this study, the one in which the seasonality influences the equilibrium of the commercial balance of the fruits and at the same time, the level of capitalization prices.

3. Research Questions / Aims of the Research

In this paper, we want to determine the influence that the seasonality of fruit production can have on the trade balance and subsequently on prices. Analysing from a structural point of view, the number of fruit trees, on average since Romania's accession to the EU until now, the most common species are that of plums, with a share in the total number of fruit trees of 48%, followed by apples - 32.7%, cherries - 6.64%, pears - 4% and apricots - 2.8%.

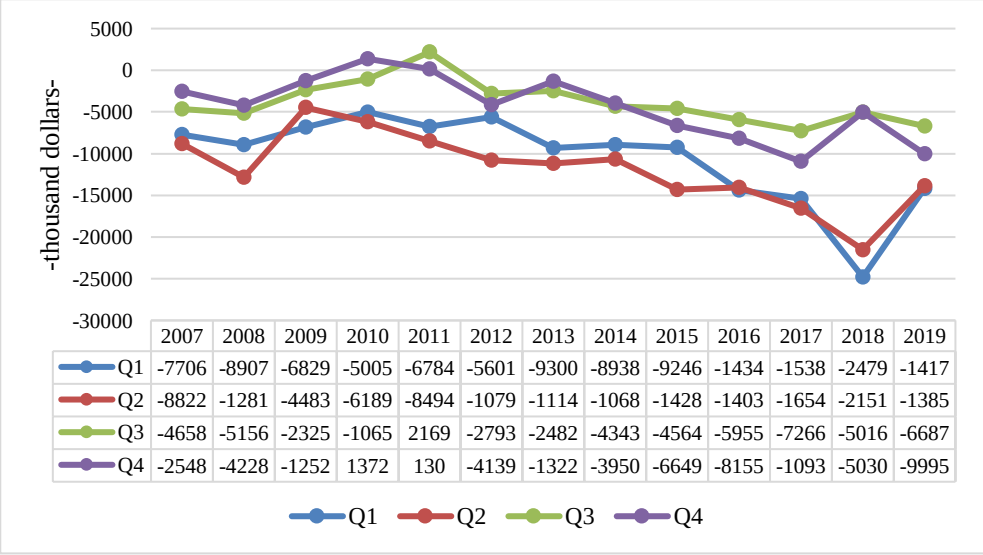
4. Research Methods

Given these weights, a quantitative and qualitative analysis was performed with reference to the trade balance for these main products based on the International Trade Centre database. For each species, the dynamics of the balance of payments from 2007 to 2019 at quarterly level was analysed, and subsequently with the help of the hypothesis testing, the quarterly averages were compared, in order to determine whether the hypothesis of this research is verified. Following this analysis, an analysis of the prices of apples and pears was made, for these species the differences between quarters being more pronounced, the data on prices being

taken from national databases (National Institute of Statistics). Finally, in order to measure the impact of seasonality on the trade balance, two linear regression models were made, for apple and pear culture, in which the independent variable was the trade balance and the dependent variable was the capitalization price.

5. Findings

The aim of this paper is to determine the impact that the seasonal nature of the fruit sector can have on the trade balance and on the prices charged. Analysing quarterly, it can be stated that most fruits are harvested in the third quarter, so, in order to make a comparative analysis of the seasonal nature, we will analyse the balance of payments of the main categories of fruit compared to the quarters, the reference being the third quarter.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Q1	-7706	-8907	-6829	-5005	-6784	-5601	-9300	-8938	-9246	-1434	-1538	-2479	-1417
Q2	-8822	-1281	-4483	-6189	-8494	-1079	-1114	-1068	-1428	-1403	-1654	-2151	-1385
Q3	-4658	-5156	-2325	-1065	2169	-2793	-2482	-4343	-4564	-5955	-7266	-5016	-6687
Q4	-2548	-4228	-1252	1372	130	-4139	-1322	-3950	-6649	-8155	-1093	-5030	-9995

Figure 1. Dynamics in the balance of payments for apple
Source: own processing based on ITC data

Figure 1 shows the dynamics of Romania's balance of payments for apple by quarters, in the period 2007-2019. It can be seen that over the period, regardless of the quarter, the trend is a decreasing one, respectively registering an increasing value deficit. Analysing the 1st quarter, it can be seen that, during this period of the year, the balance of payments was negative for each year, recording a deficit between 5 million dollars and 24.8 million dollars, in the last year there was a higher deficit by about 84% compared to the first year, for this quarter. In the second quarter, there is a similar dynamic, the deficit of the trade balance for apple being, in the analysed period, between 4.48 million dollars and 21.5 million dollars, in the last year there was a deficit greater by 57% compared to the first year taken into analysis. In the 3rd quarter, the situation is a bit different, although

there is a deficit in the vast majority of the period, this being the quarter in which these fruits are harvested, there is also a surplus of the balance of payments in 2011, amounting to 2.17 million of dollars, but nevertheless in the rest of the period there is a deficit between 1 million and 7.27 million dollars. The downward trend is smoother, with a difference between the last year and the first of 43.5%. In the last quarter, there is a surplus in two consecutive years, respectively 2010 and 2011 amounting to $ 1.37 million and $ 130 thousand, respectively.

As it has been noticed, since the 3rd quarter, when this fruit is harvested, there has been an improvement in the trade balance, given its average values. Thus, in order to be able to determine exactly whether there are significant differences between quarters, in Table 1, the average value of each was analysed using the *t* test, to test the hypotheses. The hypothesis is that in which the average values of the period differ between quarters, especially compared to the third quarter.

Table 1. Comparative analysis of quarterly balance of payments averages (apple)

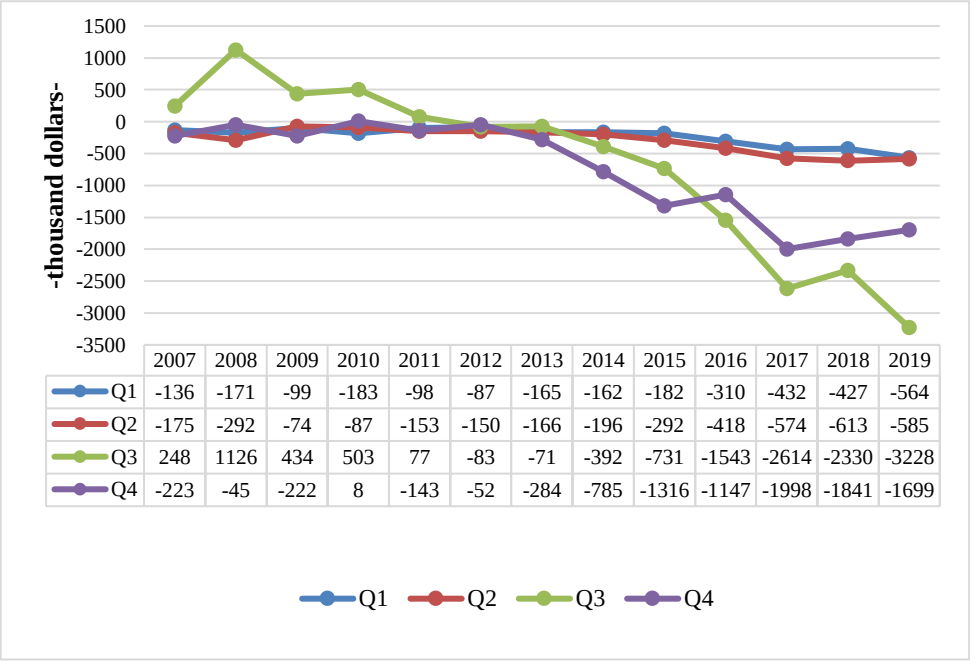
	Q1	***Q3***	***Q2***	***Q3***	***Q4***	***Q3***
Mean	-10539.9	-3857	-11818.8	-3857	-4361.92	-3857
Variance	29483917	6493150	20058251	6493150	14212467	6493150
Observations	13	13	13	13	13	13
Pearson Correlation	0.577967		0.634091		0.860047	
Hypothesized Mean Difference	0		0		0	
df	12		12		12	
t Stat	-5.39021		-8.25991		-0.89027	
P(T<=t) one-tail	8.13E-05		1.35E-06		0.19541	
t Critical one-tail	1.782288		1.782288		1.782288	
P(T<=t) two-tail	0.000163		2.71E-06		0.390819	
t Critical two-tail	2.178813		2.178813		2.178813	

Source: own calculations using Data Analysis of MS Excel

Analysing the averages of the trade balance for apple, between quarters 1 and 3 it can be seen, with the help of the *t* test, that the absolute value of the parameter, 5.39 is higher than the critical value of *t* (2.17), thus rejecting the null hypothesis, according to which the average of the values analysed between these two quarters can be zero. Thus, it can be stated that, from a statistical point of view, the averages of the two quarters differ significantly.

Analysing the 2nd quarter compared to the 3rd quarter, it is noticed again that the absolute value of the parameter *t* (of 8.26) is higher than the critical value of *t* (of 2.17), and the level of significance (P) is lower than the maximum accepted threshold of 0.05, thus excluding the null hypothesis, respectively between the average values of the two quarters the difference is not 0, which means that from a statistical point of view there is a significant difference between the averages.

Instead, between quarters 3 and 4, there is an absolute value of the parameter *t* (0.89) lower than the critical value, and the level of significance (P) is higher than the maximum allowed threshold of 0.05 (being 0.39), thus, it cannot be argued that the null hypothesis is excluded, there being the possibility that the values between the two quarters are equal at a given time.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Q1	-136	-171	-99	-183	-98	-87	-165	-162	-182	-310	-432	-427	-564
Q2	-175	-292	-74	-87	-153	-150	-166	-196	-292	-418	-574	-613	-585
Q3	248	1126	434	503	77	-83	-71	-392	-731	-1543	-2614	-2330	-3228
Q4	-223	-45	-222	8	-143	-52	-284	-785	-1316	-1147	-1998	-1841	-1699

Figure 2. Dynamics in the balance of payments for plum
Source: own processing based on ITC data

Figure 2 shows the dynamics of Romania's balance of payments for plums by quarters, in the period 2007-2019. It can be seen that over the period, regardless of the quarter, the trend is a decreasing one, respectively registering an increasing value deficit. By carrying out a quarterly analysis, it can be seen a fairly significant difference in the case of plums compared to apples. In this case, quarters 1 and 2 show a more balanced balance of payments, and quarters 3 and 4 show a strictly decreasing trend.

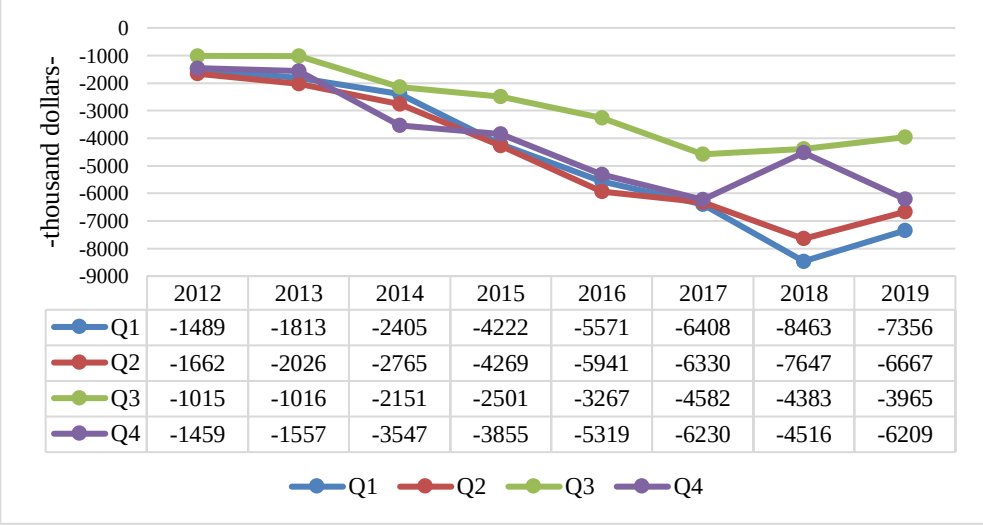
Analysing the 1st quarter, it can be seen that, during this period of the year, the balance of payments was negative for each year, registering a deficit between 87 thousand dollars and 564 thousand dollars, in the last year there being a deficit higher than about 4.15 times the first year, for this quarter. In the 2nd quarter, there is a similar dynamics, the deficit of the trade balance for plums being, in the analysed period, between 74 thousand dollars and 613 thousand dollars, in the last year there being a deficit greater than 3.2 times compared to the first year taken into analysis. In the 3rd quarter, the situation is a little different, at the beginning of the period, the first 5 years (2007-2011) there is a surplus of the balance between 77 thousand and 1.12 million dollars, in the next period (2012-2019) there is a balance deficit between $ 71,000 and $ 3.23 million. The downward trend in the balance is exponential. In the last quarter, there is a surplus in 2010, amounting to $ 8 thousand, and in the rest of the years the deficit is between 45 thousand and 2 million dollars.

Table 2. Comparative analysis of quarterly balance of payments averages (plum)

	Q1	*Q3*	*Q2*	*Q3*	*Q4*	*Q3*
		-	-	-	-	-
Mean	-232	661.846	290.385	661.846	749.769	661.846
Variance	23185.83	1820403	37672.59	1820403	569040.5	1820403
Observations	13	13	13	13	13	13
Pearson Correlation	0.922226		0.896823		0.933431	
Hypothesized Mean Difference	0		0		0	
df	12		12		12	
t Stat	1.28061		1.136669		-0.45316	
P(T<=t) one-tail	0.112265		0.138933		0.32926	
t Critical one-tail	1.782288		1.782288		1.782288	
P(T<=t) two-tail	0.224529		0.277866		0.658519	
t Critical two-tail	2.178813		2.178813		2.178813	

Source: own calculations using Data Analysis of MS Excel

For each of the three comparisons, respectively quarters 1, 2 and 4 related to quarter 3, a value of the parameter *t* is recorded below its critical value, thus, in the case of plums, the null hypothesis cannot be excluded, respectively the one in which the average value of the balance trade differs between quarters, so there is a possibility that the value of the balance of payments will be the same between quarters.



	2012	2013	2014	2015	2016	2017	2018	2019
Q1	-1489	-1813	-2405	-4222	-5571	-6408	-8463	-7356
Q2	-1662	-2026	-2765	-4269	-5941	-6330	-7647	-6667
Q3	-1015	-1016	-2151	-2501	-3267	-4582	-4383	-3965
Q4	-1459	-1557	-3547	-3855	-5319	-6230	-4516	-6209

Figure 3. Dynamics in the balance of payments for pear
Source: own processing based on ITC data

Figure 3 shows the dynamics of Romania's balance of payments for pears by quarters, in the period 2007-2019. It can be noticed that during the period, regardless of the quarter, the trend is a decreasing one, respectively registering an increasing value deficit, and surplus is not recorded in any year, regardless of the quarter.

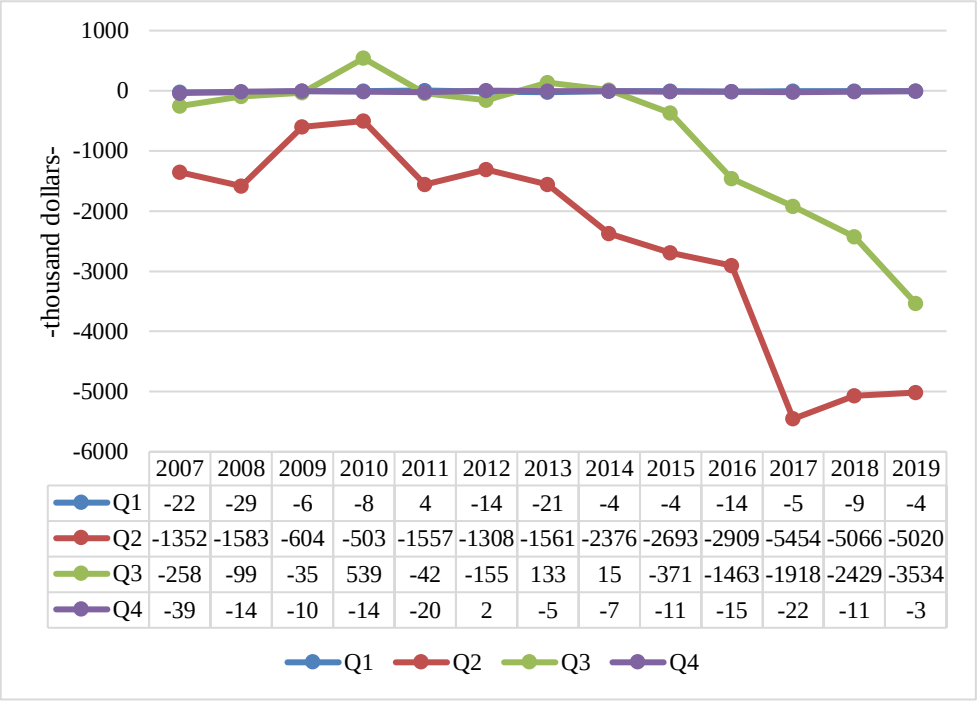
Analysing the first quarter, it can be seen that the balance of payments has a deficit between 1.49 million dollars and 8.46 million dollars, in the last year there was a deficit more than 5 times higher than the first year, for this quarter. In the second quarter, there is a similar dynamics, the deficit of the trade balance being, in the analysed period, between 1.6 million dollars and 7.6 million dollars, in the last year there was a deficit more than 4 times compared to the first year taken into analysis. In the 3rd quarter, the situation is a bit different, although there is a deficit, it is lower, given that the 3rd quarter is the one in which these fruits are harvested. The deficit is between $ 1 million and $ 4.5 million. In the last quarter, there is a deficit, which is between 1.46 million and 6.23 million dollars.

Table 3. Comparative analysis of quarterly balance of payments averages (pear)

	Q1	*Q3*	*Q2*	*Q3*	*Q4*	*Q3*
Mean	-4715.88	-2860	-4663.38	-2860	-4086.5	-2860
Variance	7004170	2015344	5292836	2015344	3492843	2015344
Observations	8	8	8	8	8	8
Pearson Correlation	0.950896		0.963881		0.924501	
Hypothesized Mean Difference	0		0		0	
df	7		7		7	
t Stat	-3.8342		-5.0702		-4.46932	
P(T<=t) one-tail	0.003211		0.000723		0.001452	
t Critical one-tail	1.894579		1.894579		1.894579	
P(T<=t) two-tail	0.006423		0.001447		0.002903	
t Critical two-tail	2.364624		2.364624		2.364624	

Source: own calculations using Data Analysis of MS Excel

Performing the hypothesis testing with the help of the *t* test, it can be seen from table 3 that the absolute value of the parameter *t* is higher in all 3 cases than the critical value of *t* (of 2.36), and the significance level being below the threshold of 0.05, it can be stated that the null hypothesis is rejected, according to which the difference between the means is 0, which would mean that the means can be equal. Thus, it can be shown statistically that between quarters 1, 2 and 4 compared to quarter 3 there is a statistically significant difference in the trade balance for pears, in other words it can be said that the value of the balance in quarter 3 is statistically different from the other three quarters.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Q1	-22	-29	-6	-8	4	-14	-21	-4	-4	-14	-5	-9	-4
Q2	-1352	-1583	-604	-503	-1557	-1308	-1561	-2376	-2693	-2909	-5454	-5066	-5020
Q3	-258	-99	-35	539	-42	-155	133	15	-371	-1463	-1918	-2429	-3534
Q4	-39	-14	-10	-14	-20	2	-5	-7	-11	-15	-22	-11	-3

Figure 4. Dynamics in the balance of payments for apricot
Source: own processing based on ITC data

Figure 4 shows the dynamics of Romania's balance of payments for apricots by quarters, in the period 2007-2019. It can be seen that over the period, regardless of the quarter, the trend is decreasing, i.e. there is a growing value deficit, except for the 1st quarter, when the value of the balance of payments is almost constant compared to the rest.

Analysing the 1st quarter, it can be seen that the balance of payments registers a deficit between 4 thousand and 29 thousand dollars, but in 2011 there is a surplus of 4 thousand dollars. In the second quarter, there is a completely different dynamics, registering a sharply decreasing trend, the deficit of the trade balance for apricots being, in the analysed period, between $ 503 thousand and $ 5.45 million, in the last year there was a larger deficit, 3.8 times higher than the first year considered. In the 3rd quarter, the situation reveals a slight difference, although there is a deficit, it is lower, being between 35 thousand and 3.5 million dollars, in 2010, 2013 and 2014 there is a surplus of 539 thousand dollars, 133 thousand dollars and 15 thousand dollars. In the last quarter, there is a deficit, which is between 3 thousand and 39 thousand dollars, in 2012 registering a surplus of 2 thousand dollars.

Table 4. Comparative analysis of quarterly balance of payments averages (apricot)

	Q1	*Q3*	*Q2*	*Q3*	*Q4*	*Q3*
Mean	-10.4615	739.769	-2460.46	739.769	-13	739.769
Variance	83.76923	1470282	2899492	1470282	104.5	1470282
Observations	13	13	13	13	13	13
Pearson Correlation	-0.22122		0.903266		-0.10398	
Hypothesized Mean Difference	0		0		0	
df	12		12		12	
t Stat	2.16494		-7.75634		2.159097	
P(T<=t) one-tail	0.025628		2.58E-06		0.025897	
t Critical one-tail	1.782288		1.782288		1.782288	
P(T<=t) two-tail	0.051257		5.15E-06		0.051795	
t Critical two-tail	2.178813		2.178813		2.178813	

Source: own calculations using Data Analysis of MS Excel

Performing the hypothesis testing analysis, this is not verified in 2 of the three cases, being still at the limit, the level of the statistical parameter *t* being at the limit, of the critical level, but below this, so there is a small probability that the average values between quarters Q1-Q3 and Q4-Q3 to be equal. Between the 2nd and 3rd quarters there is a statistically significant difference, regarding the balance of payments for apricot, the null hypothesis being rejected, it can be stated that the difference between the averages is strictly different from zero.

Given all these analyses, it can be established with certainty that the influence of seasonality on the trade balance of fruits is found mainly in apple and pear species, for which it is certain that in the 3rd quarter (the one that overlaps with the period of harvest) trade balance is lower than in other quarters. Thus, for these two species, a quarterly analysis of prices will be performed, and subsequently an analysis of the influence of the balance on them.

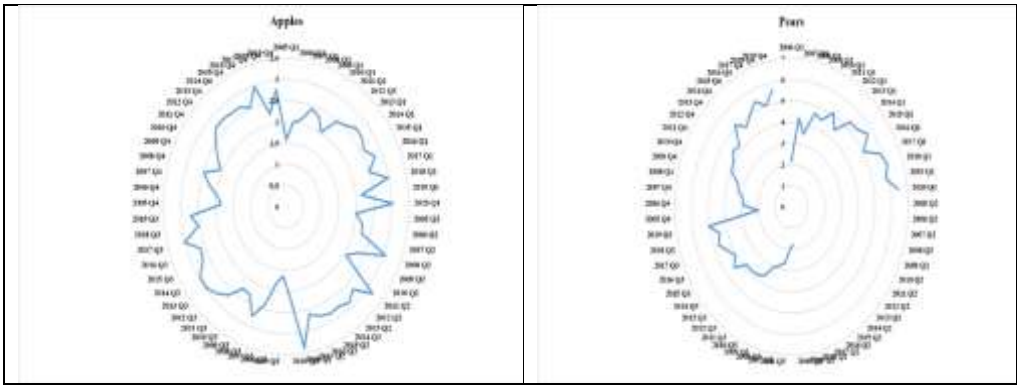


Figure 5. Apple and pear price dynamics by quarters (RON)
Source: own processing based on NIS data

Figure 5 shows the average prices on the national market for apples and pears, in the period 2007-2019 by quarters. For pears, data were recorded only for quarters 1, 3 and 4. As it can be seen, prices fluctuate greatly from year to year with a comparative analysis by quarter, and they differ depending on whether they are higher or lower.

Analysing the price of apples, on average for the entire period, in the first quarter it is RON 2.43 per kg, in the second quarter RON 2.6 per kg, in the third quarter RON 2.54 per kg and in the last quarter the price of apples raised to RON 2.45 per kg.

Analysing the price of pears, on average for the entire period, in the first quarter it is RON 4.85 per kg, in the third quarter RON 3.63 per kg and in the last quarter the price of pears rose to RON 4.13 per kg.

In order to be able to determine whether there is an influence of the trade balance on a quarterly basis on prices, a linear regression model will be developed based on which the impact that the trade balance can have on prices will be determined.

Table 5. Linear regression model between balance of payments and price for apples

Regression Statistics	
Multiple R	0.367963758
R Square	0.135397327
Adjusted R Square	0.118105274
Standard Error	0.290326167
Observations	52

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.659987763	0.659987763	7.830031738	0.007279127
Residual	50	4.21446416	0.084289283		
Total	51	4.874451923			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	2.433958474	0.069954847	34.79327837	1.0442E-36	2.293450028	2.574466919
X Variable 1	0.000021	0.000007	2.798219	0.007279	0.000006	0.000036

Source: own calculations using Data Analysis of MS Excel

Table 5 shows the running of the linear regression model between the price-dependent variable and the independent variable of the trade balance for the apple fruit. As it can be seen, the correlation coefficient is quite small, 0.367 which denotes a weak relationship in intensity but positive, respectively when one variable increases and the other increases, and the coefficient of determination is 0.13. In the ANOVA table, it can be seen that the value of F is quite high above the allowed threshold, and the significance level is below the threshold of 0.05, thus

excluding the null hypothesis. Also in the table of coefficients there is a value of the parameter *t* quite high, above the critical one, considering that the significance level is also below the maximum accepted threshold of 0.05, and the confidence intervals do not contain the null value. Therefore, it can be stated that the null hypothesis is rejected, so there is no possibility that the values of the coefficients are zero.

With the help of the linear regression model it was possible to determine the resulting equation:

Domestic price = 0.000021 * Trade balance + 2.4339

It can be appreciated that an increase by one unit of the trade balance is an increase in the domestic price by 0.000021 units, and vice versa, if it is a decrease. In the case of apples, with an increase in the deficit by 10 million, there is an increase in the price of RON 0.21.

Table 6. Linear regression model between balance of payments and price for pears

Regression Statistics	
Multiple R	0.78991881
R Square	0.62397172
Adjusted R Square	0.60687953
Standard Error	0.41177695
Observations	24

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	6.190007522	6.19000752 2	36.5062389 6	0.000004
Residual	22	3.730325812	0.16956026 4		
Total	23	9.920333333			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	3.95491688 2	0.17951823	22.0307257 1	1.74921E-16	3.58261886	4.32721490 4
X Variable 1	0.0002465	0.0000408	6.0420393	0.0000044	0.0001619	0.0003312

Source: own calculations using Data Analysis of MS Excel

Table 6 shows the running of the linear regression model between the price-dependent variable and the independent variable of the trade balance for the pear fruit. As it can be seen, the correlation coefficient is quite high, 0.789 which denotes a close relationship in terms of intensity and positive, respectively when one variable increases and the other increases, and the coefficient of determination is 0.62. In the ANOVA table, it can be seen that the value of F is quite high above the allowed threshold, and the significance level is below the threshold of 0.05, thus excluding the null hypothesis. Also in the table of coefficients there is a value of the parameter *t* quite high, above the critical one, considering that the significance level is also below the maximum accepted threshold of 0.05, and the confidence intervals do not contain the null value. Therefore, it can be stated that

the null hypothesis is rejected, so there is no possibility that the values of the coefficients are zero.

With the help of the linear regression model, it was possible to determine the resulting equation:

$$\text{Domestic price} = 0.00024 * \text{Trade balance} + 3.955$$

It can be appreciated that an increase by one unit of the trade balance is an increase in the domestic price by 0.00024 units, and vice versa, if it is a decrease. In the case of pears, at an increase of the deficit by 1 million, there is an increase of the price of RON 0.24.

6. Conclusions

In this paper, we wanted to analyse the impact of the seasonality of fruits on the trade balance and on market prices. In this sense, the dynamic analysis of the trade balance for apples, plums, pears and apricots was performed, the first four crops in terms of number of trees in Romania. This analysis of the balance of payments was performed quarterly and subsequently, for each fruit species in pairs, an analysis of the hypothesis test was performed, according to which in the 3rd quarter, that of harvest, a different average of the balance is recorded compared to the others.

For the first species, that of apples, following the analyses performed, the following can be concluded: the trade deficit registers increasing values, with the passage of time, but at different levels depending on the quarters. Thus, in quarters 1 and 2, when domestic supply is insignificant, the deficit is high, and in quarters 3 and 4 the deficit exists, but is lower, as it could be determined by testing the hypotheses, the average deficit in quarters 1 and 2 is significantly different from the average of the 3rd and 4th quarters, in other words, the first half of the year has a higher deficit than the second half of the year, thus confirming the hypothesis of this research.

For plums, the situation is different, analysing the deficit, it can be concluded that in quarters 1 and 2 the deficit is constant, and in quarters 3 and 4 there is a significant increase in the deficit, this being contrary to the hypothesis previously established in this research. By testing the hypotheses, it could not be established that the quarterly averages differ significantly. Analysing these aspects, it can be concluded that for this species, this situation is encountered because the demand fluctuates on the market depending on the quarter. Thus, the balance deficit is constant in the first half of the year because there is a constant demand, mainly industrial, and in the second half of the year there is an exponential increase in demand, in addition to industrial, being the fruit season, so in addition to the seasonality of fruit production, we can talk about a seasonality of consumption.

In the case of pears, the situation is similar to that of apples, the deficit being more and more accentuated, but in the 3rd quarter it is at a lower level than in the rest of the quarters, considering that it corresponds to the harvest period, respectively to an increase in internal supply, a fact also recorded by testing the hypotheses with the help of the *t* test.

Similarly to plums is the trade balance for apricots, there are constant dynamics in quarters 1 and 4, and in quarters 2 and 3, when there is a significant increase in human consumption, there is an increasing deficit.

In view of the above, it was considered that the most relevant fruit species regarding the influence of seasonality on the trade balance are apples and pears. Following the analysis of the prices charged for these two products, depending on the quarter, a statistical analysis could be performed using the linear regression model to determine whether the trade balance influences the price and what its impact is. Following the running of the two regression models, it was possible to determine the price regression equation depending on the trade balance. It was found that in the case of apples, if the trade deficit increases by $ 10 million, there is an increase in price by RON 0.21, so in the quarters when the deficit is higher, there is a higher price, and vice versa. In the case of pears, if the trade deficit increases by $ 1 million, there is an increase in price by RON 0.24, so in the quarters when the deficit is higher, there is a higher price, and vice versa. It is estimated that, for these two species of fruit, seasonality plays an important role in the market.

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References

[1] Movileanu, V., Botezatu, D. (2010), Comercializarea legumelor şi fructelor în stare proaspătă. In: *Lucrări ştiinţifice*, Univ. Agrară de Stat din Moldova, 25(2): *Economie*, pp. 90-94, ISBN 978-9975-64-194-4.

[2] Valpiani, N., Wilde, P., Rogers, B., Stewart, H. (2015). Patterns of fruit and vegetable availability and price competitiveness across four seasons are different in local food outlets and supermarkets. *Public health nutrition*, 1, pp. 1-9, 10.1017/S13689800 15000981.

[3] Zbancă, A., Baltag, G. (2018). Starea actuală și oportunități de dezvoltare a sectorului de fructe moi în RM. Creșterea economică în condiţiile globalizării: competitivitate, inovativitate, sustenabilitate: *Conf. intern. șt.-practică*, 11-12 oct. 2018, Chișinău. 2018, 1, pp. 242-248, ISBN 978-9975-3202-8-3.

[4] Ministry of Agriculture and Rural Development (MADR) (2017). Strategia națională pentru programele operaționale în sectorul de fructe și legume, *Direcția Generală Politici Agricole şi Strategii*.

[5] International Trade Centre (ITC) – www.intracen.org.

[6] National Institute of Statistics (NIS) – www.insse.ro.

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Public Procurement in Romania: Problems and Solutions

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Abstract

Both in Romania and worldwide, public procurement systems are an essential contact point between the economy and the public administration of each state. Through procurement systems, governments purchase products, services, make investments, stimulate and support the economy.

The very large amounts spent on public procurement have also attracted the attention of public opinion which has put national governments under pressure over the last 15-20 years to make national procurement systems more efficient.

Thus, the development of procurement systems has become of particular importance. The continuous process of analysing procurement systems aims to identify existing problems and solutions for improving public procurement systems and procedures.

This study seeks to identify a number of key issues in Romania's public procurement system and proposes a number of solutions.

The research also contains a survey conducted on the basis of a questionnaire to which Romanian purchasers responded. The survey analysed a number of issues such as: strategic function of public procurement, division into lots of the procurement, use of social/environmental criteria, participation of foreign economic operators, the risk of public procurement carried out at the end of the year, lack of human resources (purchasers), level of training of purchasers, the need for a system of professional degrees for purchasers, the utility of a system for the award of purchasers.

Keywords: public procurement, purchaser, training, strategic function, risk.

JEL classification: D73, H57, H83

1. Introduction

The public procurement system is the most important point of contact between the economy and public administration and financial resources allocated to public procurement are a possible source of corruption and conflict of interest (Kirn et al., 2019). Public procurement regulates how public funds are spent and

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is an indicator of good governance (ANAP – Romanian National Agency for Public Procurement, 2015).

With the adoption in 2014 of the European public procurement directives, the focus has been on electronic procurement (e-procurement), innovation, energy efficiency, social inclusion and environmental objectives. These key policies must be integrated by each Member State (including Romania) into their own procurement systems (ANAP, 2015). Unfortunately, only a few EU Member States have implemented social or environmental procurement policies (European Commission, 2017).

According to the annual report published by ANAP for 2018, 18,643 procurement procedures were carried out in Romania resulting in 29,069 contracts. The value of completed contracts totalled 42,484,208 thousand lei, which means approx. 8.9 billion euro (ANAP, 2019).

Taking into consideration the high annual value of the procurement conducted, it can be deduced that addressing the problems in the Romanian procurement system and identifying solutions adapted to the national context to ensure the efficiency, effectiveness and coherence of the system can result in significant savings to the state budget.

The measures used to improve the public procurement system can make them an important tool for implementing the policies and objectives of each government, which brings substantial economic benefits. At European level, actions to improve public procurement systems in the Member States include the following areas: professionalization of purchasers, widespread adoption of strategic procurement, increased transparency, data quality and integrity, cooperation for joint public procurement and adoption/development of electronic procurement (European Commission, 2017).

2. Literature review

Public procurement has been, is and will remain a very sensitive area, both in times of economic development and in times of recession. Constantly under public attention, the public procurement system must be an instrument for spending public funds in an efficient and transparent manner (Kirn et al., 2019).

Competitive, transparent and fair public procurement creates business opportunities, contributes to job creation and economic development. The efficiency of public procurement is in the interest of both the public sector and the private sector, as it results in increased competitiveness, savings in public funds and citizens' confidence in the state and its institutions (Otter & Weber, 2015).

Well-designed public procurement systems contribute to the achievement of political objectives such as innovation, job creation, environmental protection and support of small and medium-sized enterprises (OECD, 2015).

The most important shortcomings of the Romanian purchasing system were analysed by Lefter (2015). According to the author, these are: the small number of purchasers, the inadequate training of civil servants/purchasers (resulting in reduced administrative capacity of public institutions) and reduced competition.

Romania's public procurement system has also experienced frequent legislative changes, complex legislation difficult to interpret, numerous challenges and a lack of effectiveness of public investments (ANAP, 2015).

Lloyd & McClue (2004), also consider that the main problems of procurement systems are the difficulties in creating a trained workforce (well-trained and competent purchasers) and lack of professional recognition.

The professionalization of purchasers is an important issue at European level.

Governments spend large amounts of money each year through public procurement systems and unfortunately do not give enough importance to the profession of purchaser, which contributes to the economic performance of the country (O'Brien, 2011).

The failure to comply with the ethics criteria in public procurement was caused by lack of purchasers' professionalism, lack of education, inadequate motivation and low salaries of the purchasers (Magaya & Chidhawu, 2016). The employment of qualified purchasers (experts) will improve the effectiveness of the procurement and the services provided to citizens (Ageman, 2014).

The development of technical knowledge and skills of purchasers is essential to the achievement of a quality procurement process. UN (2008) considered that poor training of purchasers represents the most important barrier encountered in applying strategic public procurement in OECD Member countries. Islam & Siwar (2013) carried out a study on sustainable public procurement in Australia and Malaysia as a government instrument and found that purchasers' professional standards are low and stressed the importance of training. The ethical conduct of purchasers in the public procurement system contributes to economic progress and improvement of the quality of governance (OECD, 2015).

Purchasers need to be properly trained so that they carry out the procurement procedures efficiently and effectively in order to avoid inappropriate spending of public funds. Dzuke & Naude (2015) found that the main causes of poor performance in public procurement are the lack of qualified and experienced purchasers, most of the purchasers having qualifications in finance, accounting and human resources. Telgen et al. (2016) found that the absence of qualified civil servants and the poor understanding of legal provisions had a negative impact on the public procurement function.

Unfortunately, there are currently no regulations on purchasers' careers in Romania, there is no national record of purchasers (ANAP, 2017), the requirements they have to meet to be employed or promoted are not regulated, there is no system of professional degrees for purchasers and no central institution for the training of purchasers. The issue of the training of purchasers was also examined by Thai et al. (2009) who found that there had been no training programs (license or master) for purchasers in the United States and Canada by 2007. These purchasers were often trained in the workplace or, more rarely, in some law faculties.

Public procurement has also an important strategic function of implementing government policies (NASPO, 1997) and supporting sustainable economic development, but the strategic role of public procurement has often been ignored

(O'Brien, 2011). Also, Aldenius & Khan (2017) have found that there are no detailed studies on the strategic use of public procurement for the improvement of environmental objectives.

Harink (1999) considers that the procurement process must support the policies and strategies of each organization and Nyasulu (2019) considers that the most important advantages of strategic procurement are risk reduction, cost savings and improved public image of governments. It is now increasingly accepted that public procurement does not only have an administrative function, but is a strategic instrument that contributes to the achievement of political objectives (Quak et al., 2019).

Strategic use of public procurement can be achieved by coordinating strategic planning with the procurement process and by collaboration between public authorities and the market at an early stage for high-impact procurement (Deambrogio et al., 2016).

Although the European public procurement system has been improved recently, in many Member States the rate of publication of contract notices is still low. The most important consequence of this is the lack of opening up of markets to foreign economic operators, which means the loss of many cross-border business opportunities (European Commission, 2017).

3. Research methodology

The research aims to identify and analyse a number of shortcomings in the Romanian public procurement system and to propose solutions to remedy them.

This study contains a survey conducted among Romanian purchasers. The questionnaire addressed to the respondents contains 19 questions that tried to determine the opinion of the purchasers on a number of important issues in the field of public procurement. The questionnaire was sent to respondents by e-mail and the period during which they responded was October 2019 - November 2019.

The survey was carried out in the following stages: analysis of the literature in the field, identification of the target group of purchasers, transmission of questionnaires by e-mail, receipt and centralization of responses, interpretation of results and drafting of conclusions.

4. The target group

The questionnaire was addressed to 61 purchasers (29 from economic operators and 32 from public authorities).

The target group consisted of 34 women and 27 men. The breakdown by age groups is as follows: 20 to 30 years - 5 respondents, 30 to 40 years - 23 respondents, 40 to 50 years - 30 respondents and over 50 years - 3 respondents.

As regards the training of respondents, 5 purchasers have no training in the field, 49 purchasers have completed "public procurement expert" courses organized by the Romanian National Authority for Qualifications and 7 respondents have master studies in the field of public procurement.

The experience of purchasers is: 0 to 5 years - 11 respondents, 5 to 10 years - 20 respondents, 10 to 15 years - 20 respondents, 15 to 20 years - 7 respondents and over 20 years - 3 respondents.

5. Findings

An important function of public procurement is the strategic function. Through national procurement, any government can achieve a number of objectives such as: creating new jobs, developing infrastructure, supporting small and medium-sized enterprises, supporting research and innovation, purchasing green products, etc.

It is important to know if the questioned purchasers are aware of the strategic role of public procurement. In this regard, the question asked was: "Do public procurement have a strategic function?"

68.85% of the respondents answered that public procurement have a strategic function, 16.39% answered ”no”, and 14.75% replied that they do not know (Figure 1).

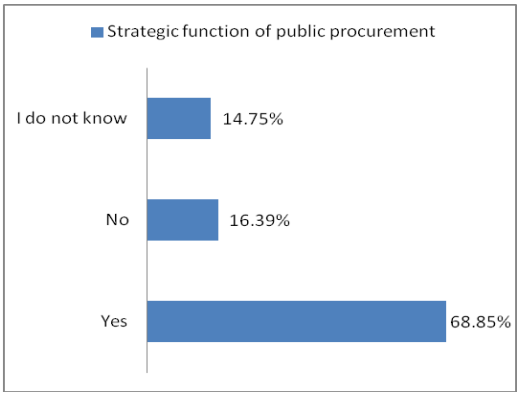

Figure 1. The strategic function of public procurement
Source: author's conception

It can be concluded from these results that the majority of the respondents are aware that public procurement fulfils a strategic function.

Currently, contracting authorities are required to determine the object of the procurement procedure in as many lots as possible in order to ensure that the contracts concluded favour as many economic operators as possible, especially small and medium companies. This measure was introduced in 2016, its usefulness being analysed by the question: "Is the division of public procurement by lots beneficial to economic operators?"

52.46% of the questioned purchasers (32 respondents) agree and 31.15% (19 respondents) expressed their total agreement (Figure 2). No respondent answered with complete disagreement or disagreement. It is clear from the responses received that 83.61% of the respondents consider that the division by lots

is beneficial to the economic operators because this measure increases the chances for more companies to win contracts.

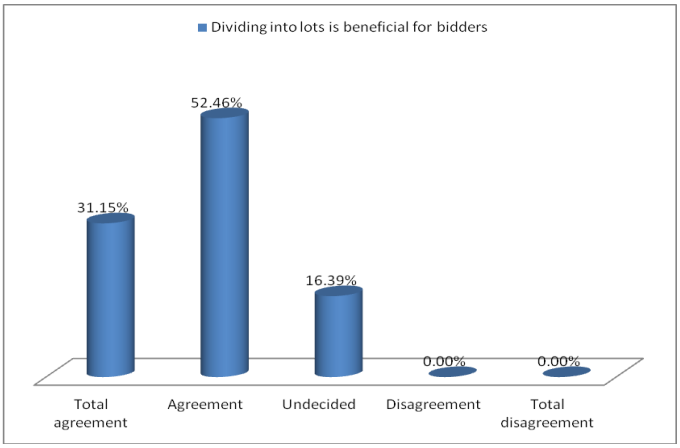

Figure 2. The division into lots is beneficial for tenderers
Source: author's conception

In the last period of time, there is an increasing emphasis on the promotion of environmental criteria / factors (energy consumption, energy certification) or social (creation of new jobs, jobs for underprivileged groups, the award of a certain number of contracts to small and medium-sized enterprises).

This topic was approached by the question: "On a scale from 1 to 10, how much do the specifications/award criteria/conditions used include social and/or environmental criteria (combating unemployment, energy consumption, labelling requirements, certificates etc.)?"

A scale from 1 to 10 was used, 1 being "at all" and 10 being "very much" (Figure 3). The most awarded scores were 3 (22.95% weight), 4 (19.67% weight), 2 and 5 (both with 18.03% weight).

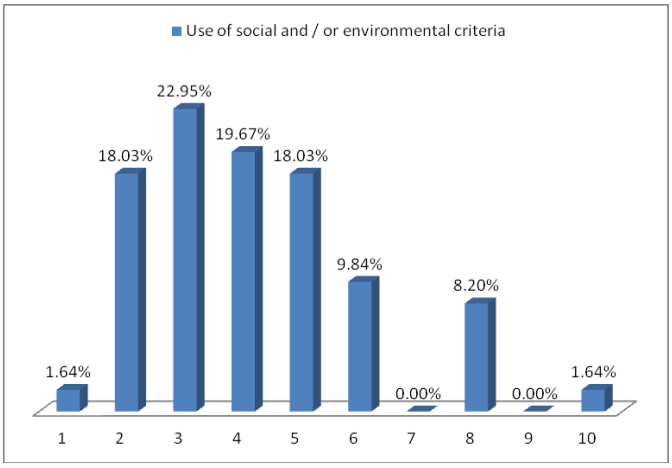

Figure 3. Use of social and/or environmental criteria
Source: author's conception

Given that the average score is 4.16, it follows that respondents rarely use social or environmental criteria in the procurement procedures.

These results should justify the measures used for implementing such criteria, in order to make government policies a reality through public procurement.

The opening of the Romanian market can also be analysed from the perspective of participating in the procurement procedures of the economic operators from abroad. The following question analyses the participation of foreign companies in the procedures: "In the last three years, has an economic operator from abroad participated in the procurement procedures that you have conducted or participated in?"

87% of the questioned purchasers replied that the economic operators from abroad did not participate in the procurement procedures and 13% replied that companies from abroad participated in the procurement procedures (Figure 4).

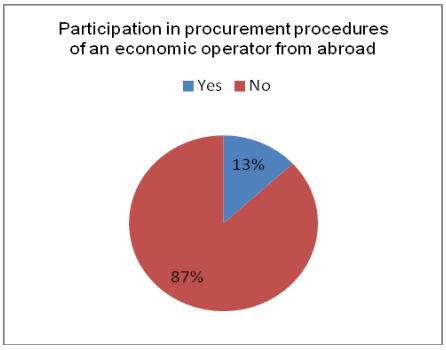

Figure 4. Participation in procurement procedures of an economic operator from abroad
Source: author's conception

In connection with the above question, it is important that companies from abroad win procurement procedures. The answers to the question "In the last three years, at the procurement procedures (that you conducted or participated in) was an economic operator from abroad declared a winner?" revealed that in 89% of the procedures organized by the respondents (or in which the respondents participated) economic operators from abroad were not declared winners (Figure 5).

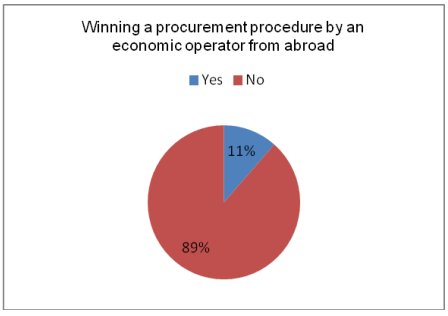

Figure 5. Winning of a procurement procedure by an economic operator from abroad
Source: author's conception

The analysis of the answers given by the purchasers to the last two questions reveals a reduced degree of openness of the procurement procedures (and of the Romanian market) to the tenders of companies from abroad.

The most important problem encountered by a foreign company that wants to participate in a procurement procedure in Romania is the language barrier because the tender must be drafted in Romanian language and all correspondence, communications related to the process of evaluating the tenders also take place in Romanian. It should be mentioned that only procurement procedures the estimated value of which exceeds the threshold of 648,288 lei, without VAT are published in the Official Journal of the European Union (JOUE). Only these procedures can be viewed in JOUE by the companies from abroad. The procurement procedures falling below the mentioned threshold are published only at national level in the Romanian Electronic Public Procurement System (SEAP).

The period at the end of the year is characterized by the fact that contracting authorities try to spend existing budgetary funds as quickly as possible because otherwise these funds are not carried over to the next year.

As this period can be a risky situation if the purchasers make mistakes or the funds are no longer spent efficiently, it is necessary to question the respondents on this issue. The question asked was the following: "Is the period at the end of the year when the contracting authorities spend the budget funds as quickly as possible a risk situation?"

81.97% of the respondents replied that the period at the end of the year represents a risk situation, while 14.75% replied that they do not know (Figure 6). It should be noted that only 3.28% of the respondents considered the end-of-year period as risk-free.

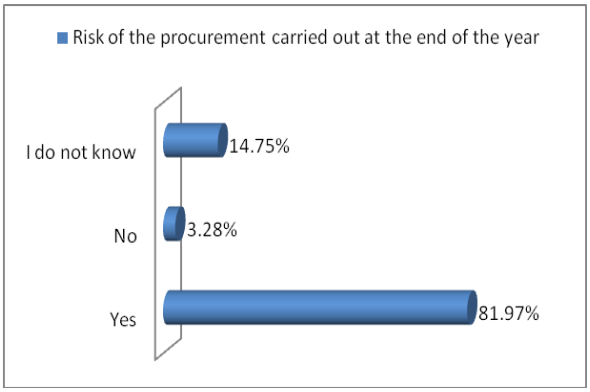

Figure 6. Risk of the public procurement carried out at the end of the year
Source: author's conception

Public procurement carried out at the end of the year presents a number of risks to contracting authorities because suppliers can ask authorities to pay higher prices, knowing that the authorities must spend the funds they have at their disposal as quickly as possible. Another possible problem may be that public authorities do not

have enough storage space in the warehouses for the bulky products to be purchased. It is also possible that at the end of the year contracting authorities may have to buy products which they already have in the warehouse or have made purchases with a total value approaching the maximum thresholds for higher procedures (for example, direct procurements approaching the threshold of 135.060 lei without VAT have been made, above this threshold is necessary a simplified procedure that lasts longer).

In some countries it is analysed whether the procurement compartments, in particular those at local level, are justified. In Romania there are many contracting authorities (at local level: municipalities, small cities) which have a reduced budget. According to S.2, (1) of the Government Decision no. 395/2016, these contracting authorities must establish an internal compartment dedicated to public procurement, even if the costs of the operation of the compartment (salaries, electricity, maintenance, etc.) are not justified by the size of the budget allocated to public procurement carried out at compartment level.

The question addressed to the respondents was: "Should the public procurement departments that carry out only direct procurement or a small number of procurement procedures be dissolved?"

From the analysis of the responses it turns out that 49% of the surveyed purchasers replied that the compartments should not be dissolved, even if they only carry out direct purchases, 30% replied that they should be dissolved and 21% replied that they do not know (Figure 7). The answers are not at all surprising, if we analyse how the interests of respondents are affected in case of closing small compartments.

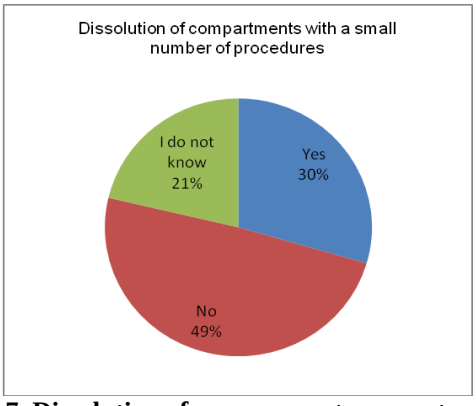

Figure 7. Dissolution of procurement compartments which carry out a small number of procedures
Source: author's conception

On the one hand, purchasers within the contracting authorities are afraid of losing their jobs, and those who remain in the large compartments (after the small ones are dissolved) should work more, carrying out more procurement procedures over the thresholds provided by law, which implies a higher level of training,

greater responsibility, risk taking, etc. Basically, in case of dissolving small compartments, we can talk about a "semi-centralization".

On the other hand, purchasers within the economic operators prefer contracting authorities with small budgets because they make more direct procurement and not (competitive) procurement procedures. Direct purchases involve the transmission of a request to a single tenderer and the acceptance of this request by the supplier, which implies simpler documentation but also the possibility of "agreements" between the contracting authority and the economic operator.

We mention that in some EU countries, the municipalities with a number of inhabitants below a certain threshold or with an allocated budget below a certain value threshold, cannot carry out public procurement. Therefore, in case of Romania, an analysis of the efficiency and justification of the existence of specialized compartments in carrying out public procurement is also required.

A problem in the field of public procurement is the lack of human resources. Even if hiring is done, the retention of qualified personnel remains a challenge, especially as young people are less attracted to the field of public procurement.

The following question addresses the problem of lack of human resources: "On a scale from 1 to 10, how big is the lack of human resources in the field of public procurement?"

The answers were given on a grading scale from 1 to 10, 1 being "not lacking human resources" and 10 being "lacking many human resources". Not surprisingly, the most awarded scores are 9 (29.51% weight), 8 and 10 (each with a weight of 24.59%) (Figure 8).

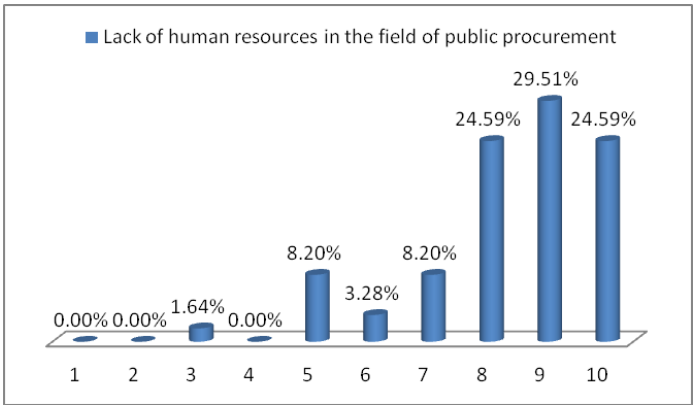

Figure 8. Lack of human resources in the field of public procurement
Source: author's conception

86.89% of the questioned purchasers answered with scores above 6. Because the average score is 8.31, we can say that the respondents consider that the lack of human resources in the field of public procurement is high.

The level of training of the purchasers was questioned next: "On a scale from 1 to 10, how well prepared are the purchasers from a professional point of view?"

The answers were given on the basis of a rating scale from 1 to 10, 1 − "very poorly prepared" and 10 − "very well prepared" (Figure 9). The most awarded scores were 7 (31.15% weight, 19 respondents in absolute value), 6 (27.87% weight, 17 respondents), 5 and 8 (13.11% weights, 8 respondents).

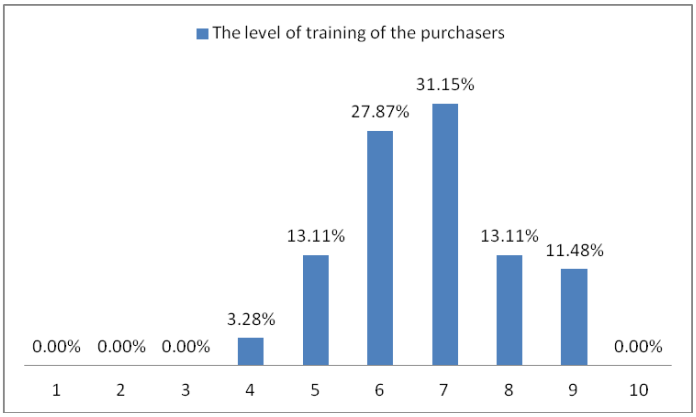

Figure 9. The level of training of the purchasers
Source: author's conception

It can be seen that 83.61% of the respondents answered with scores higher than 5, the average being of 6.72. Thus, it can be concluded that the respondents consider that the purchasers are well trained.

The receipt of support/training by the Romanian purchasers was approached by the question: "Have you received any other type of support or have you been trained on how to implement the legislative changes in the field of public procurement?"

62% of the surveyed purchasers received support and 38% did not receive (Figure 10). So, most buyers have received specialized support or training.

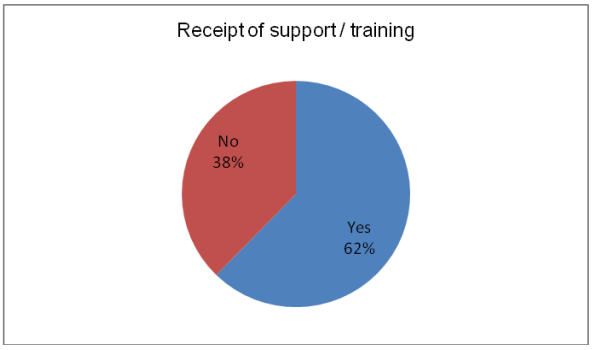

Figure 10. Receipt of support / training
Source: author's conception

The type of training received by the purchasers was analysed by the following question: "What kind of support or training have you received?"

The highest weight of 39.34% (24 respondents) received support through instructions/guides and 31.15% (19 respondents) received support through training/courses (Figure 11). Also, the tips /advices obtained a weight of 21.31%.

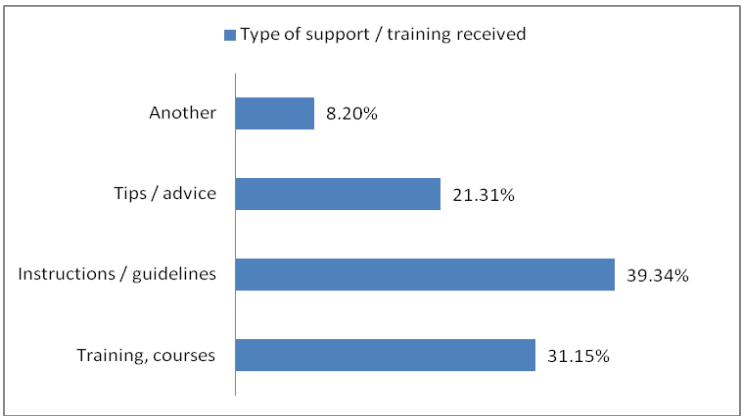

Figure 11. Type of support / training received
Source: author's conception

We can observe that the instructions/guides were the tools that contributed the most to the training of the purchasers.

The relevance of the training received by the purchasers was analysed by the question: "On a scale from 1 to 10, how relevant the training was?"

The answers were given on the basis of a rating scale from 1 to 10, 1 being "irrelevant" and 10 being "relevant" (Figure 12). The most awarded scores were 8 (26.23% weight, 16 respondents), 7 (19.67% weight, 12 respondents), respectively 5 and 9 (18.03% weight, 11 respondents).

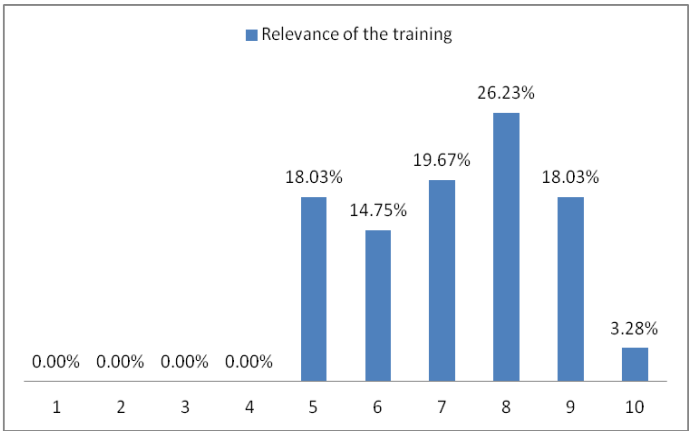

Figure 12. The relevance of the training received by the purchasers
Source: author's conception

67.21% of the questioned purchasers replied with grades over 6, the average score being of 7.21. Thus, it can be concluded that the respondents consider that the training was relevant.

Currently, there is no central institution in Romania to train the purchasers. The necessity and usefulness of setting up such an institution was the subject of the question: "On a scale from 1 to 10, how necessary and useful is the establishment of a central institution for the training of the purchasers?"

For the answers, a scale from 1 to 10 was used, 1 being "not necessary or useless" and 10 being "necessary, useful" (Figure 13). The most awarded scores were 9 (weight 32.79%, 20 respondents), 10 (26.23% weight, 16 respondents) and 8 (18.03% weight, 11 respondents).

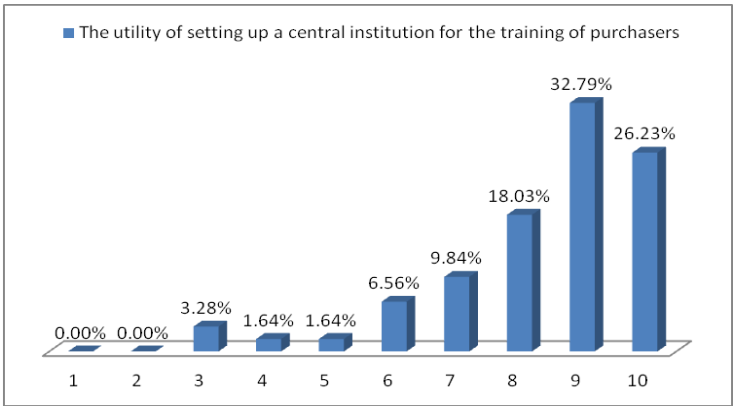

Figure 13. The utility of setting up a central institution for the training of purchasers
Source: author's conception

The importance given to such an institution is very high because 77.05% of the respondents answered with scores over 7, the average score being 8.34. Therefore, the respondents consider that a central institution that trains the purchasers in Romania is very necessary and useful.

Also, in Romania there is no system of professional degrees for purchasers, which separates the purchasers according to the knowledge in the field, their experience and competence, on the basis of which the promotions will be made. The following question addresses this topic: "On a scale from 1 to 10, how necessary and useful is the introduction of a system of professional degrees for purchasers?"

A scale of 1 to 10 was used, 1 being "not necessary or useless" and 10 being "necessary, useful" (Figure 14). The most awarded scores were 9 (31.15% weight, 19 respondents), 8 (24.59% weight, 15 respondents) and 10 respectively (19.67% weight, 12 respondents).

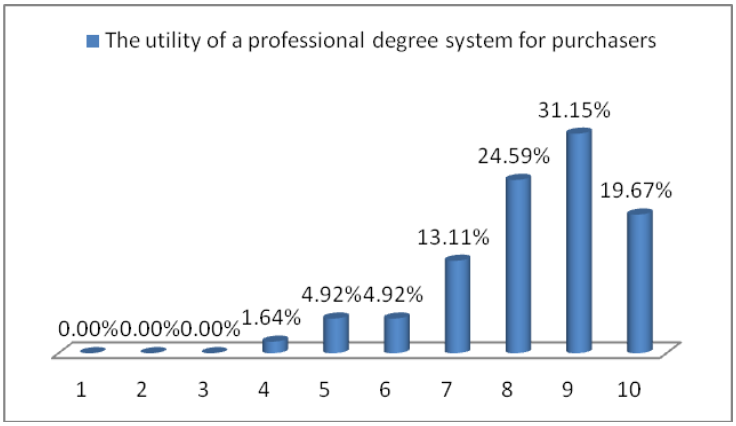

Figure 14. The utility of a professional degree system for purchasers
Source: author's conception

The questioned purchasers consider that is very necessary to set up a system of professional degrees because 75.41% have given grades over 7, and the average of the grades is 8.26.

The next issue addressed is the utility of a reward system for purchasers: "On a scale from 1 to 10, how necessary and useful is the introduction of a system of rewarding the purchasers according to the results obtained by them?"

A scale from 1 to 10 was used, 1 being "not necessary or useless" and 10 being "necessary, useful" (Figure 15). The most awarded scores were 8 (29.51% weight, 18 respondents), 9 (21.31% weight, 13 respondents) and 8 (14.75% weight, 9 respondents).

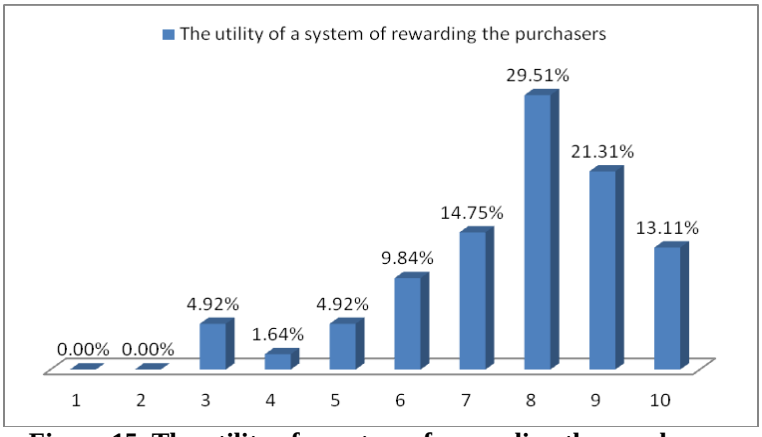

Figure 15. The utility of a system of rewarding the purchasers
Source: author's conception

Given the fact that 78.68% of the respondents scored above 6 and that the average score is 7.67, we can conclude that the respondents consider that it is

useful to set up such a system, which could also be an important factor of motivation of the purchasers.

6. Conclusions

The present study includes the results of a survey among Romanian public purchasers. The survey addresses the most important problems in the public procurement system and identifies a number of measures to improve it.

After examining the answers received, it was concluded that most of the purchasers are aware that public procurement fulfils a strategic function, consider that the division into lots is beneficial to economic operators, rarely use social or environmental criteria in procurement procedures, consider that the period at the end of the year represents a risk situation and that procurement compartments should not be dissolved, even if they only make direct purchases.

The respondents also consider that the lack of human resources in public procurement is high, the current level of training of the purchasers is good, the instructions and guides are the tools that contributed most to the training of purchasers and that there is a reduced degree of openness of public procurement procedures to tenders from foreign companies.

It is also necessary and useful to set up a central institution for the training of Romanian purchasers, to introduce a system of professional degrees and a reward system for purchasers.

References

[1] Ageman, F. (2014). Assessing Ethical Procurement Practices at Accra Metropolitan Assembly, In Maradze, A. (2019). *Public Procurement Law and Regulations Effectiveness in enhancing ethical procurement practices in Zimbabwe's State Universities*, Retrieved from http://ir.buse.ac.zw/xmlui/bitstream/handle/11196/2517/MSc%20Maradze%20Agnes.pdf?sequence=1&isAllowed=y.

[2] Aldenius, M., & Khan, J. (2017). Strategic use of green public procurement in the bus sector: challenges and opportunities, *Journal of Cleaner Production*, 164, pp. 250-257.

[3] ANAP (2015). Romanian National Agency for Public Procurement. *Strategia națională în domeniul achizițiilor publice*, Retrieved from http://anap.gov.ro/web/strategia-nationala-in-domeniul-achizitiilor-publice/.

[4] ANAP (2017). Romanian National Agency for Public Procurement. *Profesionalizarea personalului din domeniul achizițiilor publice*, Retrieved from http://anap.gov.ro/web/strategia-nationala-in-domeniul-achizitiilor-publice/profesionalizarea-personalului-din-domeniul-achizitiilor-publice/.

[5] ANAP (2019). Romanian National Agency for Public Procurement. *Indicatorii de monitorizarea eficienței procedurilor de achiziție publică finalizate prin contract în anul 2018*, Retrieved from http://anap.gov.ro/web/wp-content/uploads/2019/09/Indicatori-de-monitorizare-2018_final-23Sep2019.pdf.

[6] Deambrogio, E., Allegrettia, S., Turib, P., Zuccarelloc, F., Laricciac, P., Aghemod, C., Pellegrinod, A. (2016). Increase sustainability in buildings through Public Procurements: the PROLITE project for lighting retrofit in schools, p. 337,

8th International Conference on Sustainability in Energy and Buildings, SEB-16, 11-13 September, Turin, Italy.

[7] Dzuke, A., & Naude, M. (2015). Procurement Challenges in the Zimbabwean Public Sector: A preliminary study, *Journal of Transport and Supply Chain Management*, 9(1), pp. 1-9. In Maradze, A. (2019). Public Procurement Law and Regulations Effectiveness in enhancing ethical procurement practices in Zimbabwe's State Universities, Retrieved from http://ir.buse.ac.zw/xmlui/bitstream/handle/11196/2517/MSc%20Maradze%20Agnes.pdf?sequence=1&isAllowed=y.

[8] European Commission (2017). *Semestrul european – Fișă tematică: Achizițiile publice*, pp. 1-13, Retrieved from https://ec.europa.eu/info/sites/info/files/file_import/european-semester_thematic-factsheet_public-procurement_ro.pdf.

[9] Harink, J .H. A. (1999). Excelling with E-Procurement: The Electronic Highway to Competitive Advantage. In Thai, K. V. et al. (2009). *International Handbook of Public Procurement*, p. 3, Ed. Taylor & Francis Group, Boca Raton, Florida, USA.

[10] Islam, M. M., & Siwar, C. (2013). A Comparative study of public sector sustainable procurement practices, opportunities and barriers, *International Review of Business Research Papers*, 9(3), March 2013 Issue. In Asefa, E., W. (2019). Assessment of Sustainable Public Procurement Practices in Ethiopian Public Procurement and Property Disposal Services and Public Procurement and Property Administration Agency − A Thesis Submitted to the Addis Ababa University, School of Commerce in Partial Fulfilment of the Requirements for the Degree of Master of Arts in Logistics and Supply Chain Management, Retrieved from http://etd.aau.edu.et/bitstream/handle/123456789/20009/Ermias%20Wosenyeleh.pdf?sequence=1&isAllowed=y.

[11] Kirn, M., Umek, L., & Rakar, I. (2019). Transparency in public procurement – The case of Slovenia, *Danube: Law, Economics and Social Issues Review*, 10(3), pp. 221-239.

[12] Lefter, A. (2015). Corupție și anticorupție în achizițiile publice, S.P.A.R.L. Dragomir și Asociații, p. 1, Retrieved from http://www.dragomirlaw.ro/articles/Coruptie%20si%20anti-coruptie%20in%20achizitii%20publice.pdf.

[13] Lloyd, R., & McClue, C. (2004). What is public procurement? Definitional problems and implications, *International Public Procurement Conference Proceedings*, 3, Boca Raton, Florida, USA.

[14] Magaya, K., & Chidhawu, T. (2016). An assessment of professional ethics in public procurement system in Zimbabwe: Case of the State Procurement Board (2009-2013), *Review of Public Administration and Management*, 4(1), pp. 1-12. In Maradze, A. (2019). Public Procurement Law and Regulations Effectiveness in enhancing ethical procurement practices in Zimbabwe's State Universities, Retrieved from http://ir.buse.ac.zw/xmlui/bitstream/handle/11196/2517/MSc%20Maradze%20Agnes.pdf?sequence=1&isAllowed=y.

[15] Maradze, A. (2019). *Public Procurement Law and Regulations Effectiveness in enhancing ethical procurement practices in Zimbabwe's State Universities*, Retrieved from http://ir.buse.ac.zw/xmlui/bitstream/handle/11196/2517/MSc%20Maradze%20Agnes.pdf?sequence=1&isAllowed=y.

[16] NASPO (1997). National Association of State Purchasing Officials. State and Local Government Purchasing: Principles & Practices. In Thai K. V. et al. (2009). *International Handbook of Public Procurement*, p. 93, Ed. Taylor & Francis Group, Boca Raton, Florida, USA.

[17] Nyasulu, D. C. (2019). An evaluation of alignment of strategic procurement function in city councils and its impact on compliance levels with public procurement procedures in malawi: cases of blantyre, lilongwe and mzuzu city councils, *A thesis submitted in partial fulfilment of the requirements of the university of bolton for the degree of doctor of philosophy*, Retrieved from http://ubir.bolton.ac.uk/2434/1/Chidokiso%20 Changayizga%20Nyasulu%20-%20Feb2019%20-%20%20Final.pdf.

[18] O'Brien, J. (2011). Category Management in Purchasing: A Strategic Approach to Maximize Business Profitability, 2nd ed., New York: Prentice Hall. In Maradze, A. (2019). *Public Procurement Law and Regulations Effectiveness in enhancing ethical procurement practices in Zimbabwe's State Universities'*, Retrieved from http://ir.buse. ac.zw/xmlui/bitstream/handle/11196/2517/MSc%20Maradze%20Agnes.pdf?sequence= 1&isAllowed=y.

[19] OECD (2015). *Recomendation of the Council on Public Procurement*, Retrieved from https://www.oecd.org/gov/ethics/OECD-Recommendation-on-Public-Procurement.pdf.

[20] Otter, N., & Weber, M. (2015). Determinants of Public Sector Innovation: The Example of Capacity Development in Public Procurement, *International Public Administration Review*, 13(1), pp. 9-27.

[21] Quak, H., Nesterova, N., & Kok, R. (2019). Public procurement as driver for more sustainable urban freight transport, *Transportation Research Procedia*, 39, pp. 428-439.

[22] Telgen, J., van der Krift, J., & Wake, D. (2016). Public procurement reform: assessing interventions aimed at improving transparency, UK Aid, *Department for International Development*, London: DFID., p. 17, Retrieved from https://gsdrc.org/wp-content/ uploads/2017/05/Public-Procurement-Reform.pdf.

[23] Thai, K. V. et al. (2009). *International Handbook of Public Procurement*, p. 11, Ed. Taylor & Francis Group, Boca Raton, Florida, USA.

[24] UN (2008). *United Nations Sustainable Development Innovation Briefs*, (5). In Assefa, E., W. (2019). Assessment of Sustainable Public Procurement Practices in Ethiopian Public Procurement and Property Disposal Services and Public Procurement and Property Administration Agency − A Thesis Submitted to the Addis Ababa University, School of Commerce in Partial Fulfilment of the Requirements for the Degree of Master of Arts in Logistics and Supply Chain Management', Retrieved from http:// etd.aau.edu.et/bitstream/handle/123456789/20009/Ermias%20Wosenyeleh.pdf?sequenc e=1&isAllowed=y.

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Impact of Tourism Activities on Sustainable Community Development

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Abstract

Tourism activities in various forms can affect air quality, land use, availability and quality of water resources, and biodiversity. There is a direct relationship between the impact of tourism and sustainability on the ecosystems of a particular area. In recent years we are witnessing an accelerated tourism development which tends to affect the balance between meeting tourism demand and its ability to be absorbed by the environment. The objective of this empirical research is to analyse from a theoretical point of view what is the impact of tourism activities on sustainable community development. Therefore, the methodology of the paper focuses on a systematic literature review of main research articles in the field. Furthermore, various studies have been analysed on this issue and relevant findings were provided. The increasing density of tourist pressure, on the one hand, is beneficial for the tourism sector and the economy of a country, but, on the other hand, increases the concern for the future viability of this phenomenon. Sustainable development of tourism in the long term can only be achieved by eliminating the negative impact on the ecosystem.

Keywords: sustainability, tourism industry, community development, sustainable tourism, regional tourism.

JEL Classification: L83, Q56, Z32

1. Introduction

The goal of any company is to achieve economic development, bearing in mind that the benefits obtained must be greater than the costs, including the costs related to conservation and environmental protection. As a result of a massive development, economic development with a massive degradation of the environment, and sustainable development – a concept formulated at the end of the 20th century – has the difficult task of harmonizing two parallel realities: economic activity and ecological mechanisms. (Mitchell, 2018) Sustainable development aims to maximise well-being as a result of economic activity, while maintaining or increasing over

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time the stock of economic, ecological and sociocultural assets and meeting the basic needs of the poor (Clini et al., 2008). From this point of view, sustainability includes two equally important functions: the fair distribution of economic results and the limitation of negative impact on the environment. Economic development depends on the natural environment of the human being, its quality and, consequently, any reckless, irrational economic activity, usually causes disturbances in nature and in the economy. Any violation of the relationship between the economy and the environment generates, sooner or later, economic, social and ecological dysfunctions, with profound harmful effects on the individual and human society. The shift to sustainable development marks humanity's entry into the age of the environment, where the risks of development must be diminished, increasingly strongly or even removed.

2. Literature Review

Sustainable development is economic growth, geared towards the use of natural resources owned by the planet, conventional and unconventional energy types, respectively, under the conditions of environmental protection and conservation (Pin & Bureau, 2017). Since the first formulations on the concept of sustainable development have been introduced to date, it has been continuously improved, improved both by formulations and especially by content as is apparent from the numerous interpretations (Rao, 1999; Parris & Kates, 2003; Elliott, 2012; Liu et al., 2018). Their analysis highlights the existence of both common and specific parts of the concept of sustainable development. The common part of these interpretations is given by the global vision, which highlights the complex and dynamic interdependencies between economic, technological, ecological and social plans (Kuik & Verbruggen, 2012). The specificity of the interpretations relating to this concept is given by the differentiation of the opinions by which sustainability is addressed at the level of the plans (Ioppolo et al., 2016; Pradhan et al., 2017):

- it highlights the need to obtain a maximum income provided that capital is up stated (physical, natural, human), i.e. income must exceed consumption, which implies an approach in terms of economic efficiency;
- it highlights the need to support natural biological ecosystems as well as anthropized ecosystems, which implies addressing the concept of sustainable development through the prism of a population in a positive numerical dynamic that results in an appropriate consumption of resources, but which exceeds stocks, i.e. the recovery potential which will have unintended consequences for maintaining ecological balance. At the same time, the need to improve and conserve global biodiversity is highlighted;
- socio-culturally, it maintains the stability of social, educational and cultural structures;
- morally and spiritually, it is based on the relationship with the ethical values held by human behaviours, as a factor in increasing the efficiency of social work.

From the analysis of the concept of sustainable development in the literature, it is concluded that it must be addressed in line with the reconciliation between the economy and the environment on a new path that supports human progress, not only in a few places and for a few years, but for the whole planet and for the long term. This involves achieving a set of economic and social objectives covering the following (Lélé, 1991; Sharpley, 2000; Holmberg, & Sandbrook, 2019):

- achieving economic growth on the basis of the conservation and protection of natural resources;
- ensuring essential requirements for work, food, energy, water, housing and healthcare for people;
- a new quality of economic growth processes;
- controlled population growth;
- conservation and increase of resource pool;
- technological restructuring and the control of possible risks;
- integrated approach to environmental protection, economic growth and energy needs.

Sustainable development requires a harmonious combination, i.e. ensuring simultaneous progress on four levels (Figure. 1): economic, social, ecological and technological, hence the idea that the overall objective of sustainable development is to find an optimal interaction between these four systems that will be able to solve the problem of both economic growth and its quality.

Sustainable development is also a process of improving the quality of life for the entire population without increasing the use of natural resources beyond the limits of the earth's bear ability, which means ensuring the country's economic growth, social equity, environmental protection and the conservation of natural resources.

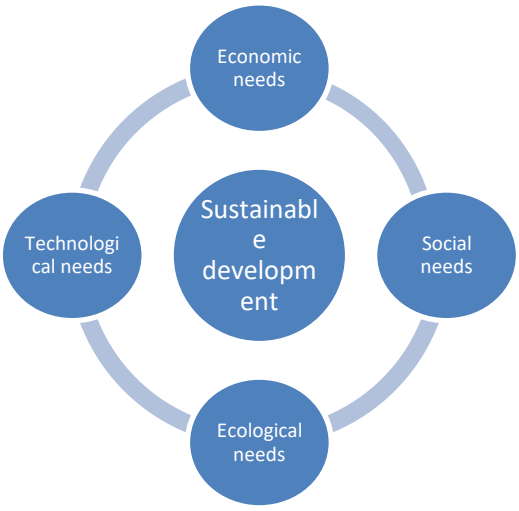

Figure1. The interdependencies of the concept of sustainable development
Source: Created by author, based on literature review

The degradation of environmental values required the development of environmental policies, grouped on the two types of values: human and environmental health; the quality of nature in terms of biodiversity and ecosystem productivity. From this exposure we can conclude that the following sustainable development can only be conceived as a relationship between the following elements (Nagimov et al., 2018):

- *culture*, which shows functions of society and what behavioural changes are essential for the application of sustainable development;
- *structure*, which must specify the organisation of how sustainable development is achieved;
- *technology*, which must establish the technological means by which sustainable development can be achieved.

3. Research Methodology

In this paper, in order to investigate the impact of tourism activities on sustainable community development, a systematic literature review including the most relevant articles and books in the field, as well as the analysis of major international research were carried out. In this regard, the present analysis aimed at three essential objectives:

- Investigating the concept of sustainable development,
- Analysing sustainable development issues in the tourism industry,
- Presenting the main considerations regarding the influence of tourism activities on the community to ensure sustainable development.

4. The Concept of Sustainable Development in the Tourism Industry

The idea of sustainable development has been strongly used over the past two decades due to accelerated industrial development over the past two centuries. Although it has a more recent history, the tourism industry stands out as particularly invasive in relation to the environment and society. The field of tourism is distinguished by the fact that sustainable development practices coexist with conventional practices. In the context of sustainable tourism, the form that arouses real interest is ecotourism.

Through the development of its many forms of concrete manifestation, management and tourism marketing sustainable tourism ensures the natural and economic integrity of the environment and rationally harnesses natural and cultural resources, but retains the necessary potential for future generations and identifies itself practically with a state of dynamic equilibrium of supply and demand, which outlines any modern tourist market.

The literature illustrates various approaches to the concept of sustainable tourism. It represents, on the one hand, all the infrastructures in the natural space that operate for the future regeneration and productivity of available resources; and on the other hand, the contribution that individuals, their consumption habits, lifestyle, income level, make within tourism (Butler, 1993). In this context, we mention that there is a

two-way effect because in order to talk about sustainability, this sector must, in turn, be able to create a range of opportunities, taking into account: the environmental approach, which focuses on the need to protect nature, the economic approach, which is based on the incorporation of resource needs, the social approach, which has as its main point of analysis the empowerment of those in a tourist destination.

Sustainable tourism is a complex problem present in the economic and social environment, which shows awareness of the complex link between the environment and the economy. There is also a pressing need to integrate these two components, which means based on the premises of a profound and lasting development that will have a positive impact on society as a whole (Nagimov et al., 2018). The increasing need for sustainability is also a result of the high volume of knowledge and concern regarding the impact on tourism and environmental issues in general. The development of tourism without sustainability can lead to a serious deterioration of the society, but also of the environment and of the entire tourism industry.

The direct relationship between tourism and sustainable development is also created because in tourism, unlike other industries, the consumer, namely the tourist, moves towards the producer and the product, and when it is properly planned and managed, it can be a means of maintenance for rural and urban communities. From the above, three key aspects of the sustainable tourism-development relationship emerge:

- Direct and indirect *interaction* between tourists, the host community and the local environment;
- *Awareness* of environmental issues and cultural differences, paying more attention to the sustainable aspect;
- *Motivation* of tourists to visit regions with an intact, attractive natural environment and to get in touch with local communities.

From the point of view of this relationship, tourism can have a positive impact in terms of local sustainable development, but it can also cause environmental damage. *The positive impact* is based on creating opportunities for local economic development and increasing the number of jobs; stimulating the incentives; creation and development of local infrastructure; establishing inter-cultural links; obtaining income from the exploitation of natural and cultural resources, which can be used for conservation and environmental protection activities. *The negative impact* can be manifested by: exerting direct pressure on fragile ecosystems; the exercise of considerable pressure on host communities which may lead to the loss of its authenticity; increase local pollution.

To date, sustainable tourism has undergone three paradigm shifts (Clarke, 1997). The first paradigm dissociates sustainable tourism from mass tourism, the first being considered good, while the latter is considered harmful. The second paradigm deals with sustainable tourism on a scale from weak to strong, in which weak implies well-being through economic growth and technical innovation and strong, the protection of scarce resources. The third paradigm argues that sustainable tourism should include all types of tourism and mass tourism should be subject to improvement. In addition to these issues, we note that in order to talk about convergence, all forms of

tourism should be sustainable. Saarinen (2006) underlines the importance of sustainability in tourism, while taking into account discussion and criticism, as well as the need to understand the nature of growth limits (Saarinen, 2006). According to Sharpley (2000), over the past decade, the concept of sustainable development in tourism has become the goal of increased attention of tourism theorists and practitioners alike. Today, this concept enjoys broad acceptance as an objective of tourism development and practice policy, and many tourism industry organisations have adopted several principles and sustainable development plans in tourism (Sharpley, 2000). It also draws attention to several differences between sustainable development and sustainable tourism.

Although it involves environmental protection objectives, sustainable tourism does not pay enough attention to the development component. Currently, it makes its presence felt more than ever, as the need to find a balance between all forms of tourism, economic interests has to be in balance with social and environmental aspects (Kilipiris & Zardava, 2012). This means that companies could maximize their profits while assuming a social and environmental responsibility.

Sustainable economic development in the short term and in the long term can be achieved by: promoting partnerships between small and medium-sized enterprises and multinational tourism organisations; organising training courses for tourism workers; obtaining international certification; diversifying the tourist offer; allocating resources to promote and diversify tourism products and services.

Sustainable environmental development can be achieved by: promoting ethical codes and rules of conduct among tourists; continuous monitoring of the environmental impact of tourism; drafting development policies and strategies in accordance with the principles of sustainable development; applying sustainable management in protected natural areas visited by tourists.

Sustainable cultural development can be achieved by: preserving cultural integrity; preserving local cultural diversity; ensuring the protection of the natural environment and traditions; encouraging local people to keep traditional habits; respecting the property rights of local people; educating tourists to adopt appropriate behaviour.

The sustainable development of local communities, aimed at generating economic benefits, is achieved: if the community maintains control over the development of tourism; through tourism jobs created for residents; if small local entrepreneurs are encouraged; if there is an increase in local living standards as a result of tourist activities.

In order to reduce the pressure of tourism on natural and anthropogenic resources, a management plan should be drawn up to be properly applied at all levels. Marine and coastal regions, historical cities, cultural-historical objectives and fragile natural environments are the first destinations where corresponding resource management should be applied.

Large travel companies have responded to sustainability by developing responsible strategies, with a focus on social issues, while some small and medium-sized enterprises have tried to make themselves known through their interest in social

and environmental policies, and it seems, they have, indeed, succeeded due to the active involvement of their owners in this regard. However, there is an increase in their interest and response, supported by national governments. We are currently seeing a clear increase of interest in terms of the consumption of sustainable products and services, and the market segments represented by cultural and nature-based tourism are increasingly represented.

The sustainability of businesses and the way of transposing this concept into everyday practice begin when both researchers and practitioners started to realize that the dynamics of increasing the exploitation of natural resources will be greater than the possibilities of their regeneration. As the gap between the consumption of natural resources necessary to ensure the life of mankind and the degree of their renewal will increase, the resulting situation will influence both the environment and the level of resources and raw materials available to future generations.

The transposition of the concept of sustainable development in tourism businesses has some major features. Although it is sometimes difficult or even impossible to quantify the impact of the tourism business on the environment, the adverse effects of unsustainable economic activity can cause the disappearance of tourism in a given area or drastically diminish its importance (Hobson & Essex, 2001). Excessive pollution of a beach area, the absence of a uniform, pleasant architecture may cause tourists' preference for a particular destination to change regardless of the motivation for visiting it (Elmo et al., 2020). Both those responsible for companies with tourist activities (tourist agencies, tour operators, accommodation and food establishments, transporters, etc.) and representatives of local authorities may face a number of major environmental problems. Among them there is the lack of a clear strategic vision in terms of the harmonious and integrated promotion and development of the resort, the coordinated non-involvement of all tourism actors in the controlled design and transposition into operation of a sustainable strategy of the area, the increase in the amount of waste and waste water generated by local tourism businesses, the absence of energy efficient transhipment between railway stations or airports, increased energy consumption, limited possibilities for reuse of packaging, the impossibility of purchasing local products to support producers in the region, etc. (Persic-Zivadinov & Blazevik, 2010).

The relevance of the conservation of natural resources, in conjunction with ensuring the social balance of tourist destinations, is a true strategic driver of sustainable development achieved at international and national level. This reality is acknowledged by many organisations, associations and institutions with activities in the area of international tourism, as they contribute to supporting the efforts undertaken by national and local authorities, but also by representatives of tourism businesses, who admit that their activities impact the environment and lead to the degradation of infrastructure in the area. It should be noted that these efforts also enjoy broad acceptance and appropriate support from the public (Fang, 2020). The proliferation of sustainable tourism within different tourist destinations cannot take place without the existence of appropriate legislation (Morgera, 2010) aimed at regulating a number of specific factors. These include investments in biodiversity

conservation and the promotion of sustainable local business, the integrated approach to the ecosystem, the protection of local communities from the negative effects of discrimination and/or marginalisation, the harmonious preservation and support of local traditions and customs with a view to passing them on to future generations, reducing waste and pollution, reducing social risks and the rush for resources, supporting opportunities for future generations in order to increase their employment in local communities, etc. (Larimian & Sadeghi, 2019). Additional, methodological rules of application, penalties and fines must be laid down, as the proper implementation of restrictive measures and the sanctioning of the culpable ones must be pursued consistently and seriously (Ghahramanpouri et al., 2013). A problem relevant to local communities is the concrete quantification of sustainable development (Shirazi & Keivani, 2019).

In order for a particular region to benefit from the positive contribution of sustainable development highlighted through the economic component – improving the transport system, restoring infrastructure, increasing the income of residents, increasing urban security, increasing the standard of living and employment, using local infrastructure for sporting, cultural events, etc. it is necessary for public decision-makers to draw up a concrete action plan with carefully defined objectives, to support local tourism initiatives and businesses aimed at attracting more tourists, to invest sustainably in promoting tourism at national and global level (Akpan & Obang, 2012). The success of implementing a strategic vision focused on sustainable development within your own tourism business also depends to a large extent on the capacity in which decision-makers are able to implement some substantial adjustments to everyday realities, to market signals, to behavioural or attitude changes, as well as to customers' wishes and preferences (Berry & Ladkin, 1997). Initiatives in the area of sustainability of tourist accommodation businesses have long been a novelty, and even become a strategic vector used more and more intensively by the management of large hotel chains in promoting and sustaining their own visions.

Sustainable development in tourism is not only the preserve of public authorities (national, regional or local), business representatives in this sector (accommodation, food, transport, etc.), but also of consumers. Tourists need to know and understand the principles of sustainability, to shape all their behaviour, preferences, consumption habits or attitudes according to the rules and norms of the field, and to contribute to proper compliance with the dimensions of sustainability. In addition, however, they can objectively assess the sustainable development actions undertaken by the authorities or actors of the tourist industry, highlighting relevant views or even proposing directions to improve the activities already practiced. The consumption of tourist products can become sustainable only to the extent that the concept of sustainability is properly translated into practice, understood and pursued by tourists (Niñerola et al., 2019). Tourism business representatives seek the optimal way to present their own benefits properly, highlighting to customers the sustainable traits obtained by them through consumption (Cheer & Lew, 2017). According to the principles of sustainability development, by increasing the increased responsibility

for some environmental problems (reducing the amount of waste (reducing the amount of waste, efficiency of the water or energy consumption of a hotel, etc.) business management may lead to an increase in the number of tourists (Hobson & Essex, 2001).

The close relationship between tourism and the environment is based on: geographical elements considered to be tourist attractions; tourist facilities and infrastructure belonging to the artificial environment; and the environmental impact generated by the development of tourism and the tourist use of the regions. Taking into account the need to ensure the sustainability of tourism activities, it is necessary to interconnect tourism with the environment in its two forms: the reduced form and the extended form. The reduced form includes two directions: environmentally sensitive tourism and environmentally dependent tourism. Environmentally sensitive tourism is aimed at pollution, nature conservation and the protection of the built environment, and environmentally dependent tourism refers to the Green Sector area of the tourism industry that provides an experience in nature. The broad form includes the emergence of tourist events in the context of local culture and the improvement of the economic profitability of the tourism industry.

Since the last decades of the last millennium, we have been seeing an accelerated tourism development which tends to affect the balance between meeting tourism demand and its ability to be absorbed by the environment. It is noted that there is pressure affecting tourist resources or the component of tourism potential (natural and anthropogenic); the social component, i.e. the impact on the resident population in those areas. Practically, exceeding the maximum visitation capacity (through direct tourist pressure on the landscape or other tourist attractions by incorrectly capitalizing tourist attractions) leads to a number of negative effects, starting with tourist attractions and the satisfaction of tourists and ending with the perception of residents. Residents compete with those who temporarily visit the city (tourists, visitors, commuters, migrant workers) for the use of space and services. Competition is particularly strong when real estate is used, due to the increase in demand for non-residential use. As there is excess demand, it generates higher prices in the real estate and product markets, which leads to an increase in the cost of living. The use of tourism can help improve the economic and social conditions of some of the inhabitants, but it can also cause an increase in environmental problems. In addition, they make it difficult for residents to access public transport. The negative impact is highlighted by environmental, water, air, noise, visual pollution, waste, environmental risk, impact on architectural or historical sites, as well as damage as a result of land use as a whole.

5. Conclusions

The analysis of the pressure of regional tourism based on the scale of the relationship between supply and demand, the interdependence of tourism demand indicators and the absorption capacity of the region highlights a number of negative influences in terms of environmental protection and quality, economic growth processes and population well-being. We understand that tourism activities in

various forms can cause negative effects related to air pollution, land use, availability and quality of water resources, and biodiversity. It is obvious that there is a direct relationship between the impact of tourism and sustainability on the ecosystems of a particular area. On the basis of this argument, the sustainable development of long-term tourism can only be achieved by eliminating the negative impact on the ecosystem.

In order to strike a balance between development and conservation, it may be necessary to limit or even cease the extended development, requiring a wide range of tourism management measures. It is becoming increasingly clear that there is a need to develop a new form of tourism, a sustainable tourism capable of maintaining a high level of tourist satisfaction and ensuring a significant experience for tourists, under the conditions of awareness of sustainability issues and promotion of sustainable tourism practices.

References

[1] Akpan, E. I., Obang, C. E. (2012). Tourism: A Strategy for Sustainable Economic Development in Cross River State, Nigeria. *International Journal of Business and Social Science*, 3(5), pp. 124-129.

[2] Berry, S., Ladkin, A. (1997). Sustainable Tourism: A regional perspective. *Tourism Management*, 18(7), pp. 433-440.

[3] Butler, R. W. (1993). Tourism – an evolutionary perspective. In: J. G. Nelson, R. W. Butler, G. Wall, eds. 1993. *Tourism and Sustainable Development: Monitoring, Planning, Managing*. Waterloo: University of Waterloo, pp. 27-44.

[4] Cheer, J. M., & Lew, A. A. (Eds.). (2017). *Tourism, resilience and sustainability: Adapting to social, political and economic change*. Routledge.

[5] Clarke, J. (1997). A framework of approaches to sustainable tourism. *Journal of Sustainable Tourism*, 5(3), pp. 224-233.

[6] Clini, C., Musu, I., & Gullino, M. L. (2008). *Sustainable development and environmental management*. Springer, Dordrecht, The Netherlands.

[7] Elliott, J. (2012). *An introduction to sustainable development*. Routledge.

[8] Elmo, G. C., Arcese, G., Valeri, M., Poponi, S., & Pacchera, F. (2020). Sustainability in Tourism as an Innovation Driver: An Analysis of Family Business Reality. *Sustainability*, 12(15), p. 6149.

[9] Fang, W. T. (2020). Rural Tourism. In *Tourism in Emerging Economies*, pp. 103-129, Springer, Singapore.

[10] Ghahramanpouri, A., Lamit, H., & Sedaghatnia, S. (2013). Urban social sustainability trends in research literature. *Asian Social Science*, 9(4), p. 185.

[11] Hobson, K., Essex, S. (2001). Sustainable Tourism: A View from Accommodation Businesses. *The Service Industries Journal*, 21(4), pp. 133-146.

[12] Holmberg, J., & Sandbrook, R. (2019). Sustainable development: what is to be done?. In *Policies for a small planet*, pp. 19-38, Routledge.

[13] Ioppolo, G., Cucurachi, S., Salomone, R., Saija, G., & Shi, L. (2016). Sustainable local development and environmental governance: A strategic planning experience. *Sustainability*, 8(2), p. 180.

[14] Kilipiris, F., Zardava, S. (2012). Developing sustainable tourism in a changing environment: issues for the tourism enterprises (travel agencies and hospitality enterprises). *Procedia − Social and Behavioral Sciences*, 44, pp. 44-52.

[15] Kuik, O. J., & Verbruggen, H. (Eds.). (2012). *In search of indicators of sustainable development*, 1. Springer Science & Business Media.

[16] Larimian, T., & Sadeghi, A. (2019). Measuring urban social sustainability: Scale development and validation. *Environment and Planning B: Urban Analytics and City Science*, 2399808319882950.

[17] Lélé, S. M. (1991). Sustainable development: a critical review. *World development*, 19(6), pp. 607-621.

[18] Liu, J., Hull, V., Godfray, H. C. J., Tilman, D., Gleick, P., Hoff, H., ... & Li, S. (2018). Nexus approaches to global sustainable development. *Nature Sustainability*, 1(9), pp. 466-476.

[19] Mitchell, B. (2018). *Resource and environmental management*. Oxford University Press.

[20] Morgera, E. (2010). Tourism for Sustainable Mountains Development: A Comparative Law Perspective. *Working Paper Series*. University of Edinburgh: School of Law, 26, pp. 1-12.

[21] Nagimov, A. R., Akhmetshin, E. M., Slanov, V. P., Shpakova, R. N., Solomonov, M. P., & Ilyaschenko, D. P. (2018). *Foresight technologies in the formation of a sustainable regional development strategy*.

[22] Niñerola, A., Sánchez-Rebull, M. V., & Hernández-Lara, A. B. (2019). Tourism research on sustainability: A bibliometric analysis. *Sustainability*, 11(5), p. 1377.

[23] Parris, T. M., & Kates, R. W. (2003). Characterizing and measuring sustainable development. *Annual Review of environment and resources*, 28(1), pp. 559-586.

[24] Persic-Zivadinov, P., Blazevik, B. (2010). Sustainable Hotels: Sustainable Life Cycle Practice in Croatian Hotels. *Conference Proceedings: Tourism & Hospitality industry 2010 – New Trends in Tourism and Hospitality Management*, pp. 161-177.

[25] Pin, K., & Bureau, F. C. E. P. (2017). Analysis of environmental engineering management. *Environment and Development*, (6), p. 146.

[26] Pradhan, P., Costa, L., Rybski, D., Lucht, W., & Kropp, J. P. (2017). A systematic study of Sustainable Development Goal (SDG) interactions. *Earth's Future*, 5(11), pp. 1169-1179.

[27] Rao, P. K. (1999). *Sustainable development*, 1, Blackwell Publishers.

[28] Saarinen, J. (2006). Traditions of sustainability in tourism studies. *Annals of Tourism Research*, 33(4), pp. 1121-1140.

[29] Sharpley, R. (2000). Tourism and sustainable development: Exploring the theoretical divide. *Journal of Sustainable tourism*, 8(1), pp. 1-19.

[30] Shirazi, M. R., & Keivani, R. (Eds.). (2019). *Urban social sustainability: theory, policy and practice*. Routledge.

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The Role of Emotional Intelligence in the Career Development of Employee in Public Organizations

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Abstract

Research background: Emotional intelligence (EI) is the ability of an individual to be aware of their own emotions, feelings, to identify and manage them in different situations. Dealing with one's own feelings implies precisely to distinguish elements or circumstances in which we lose focus or efficiency. It is important to be confident in your own strengths and to be able to manage your emotions and moods, so that they lead you to those wise choices that will bring success for you career. Emotional intelligence and career development are important psychosocial capacities for a successful adaptation of professional life, including careers management. Employees who have developed emotional skills have the ability to act better, and make the right decisions, as compared to other individuals who do not have developed emotional skills, so they think more clearly, more constructive even when they are in extreme situations or when working under stress. However, there is a reduced number of publications on the relationship between emotional intelligence and career development in public institutions. The purpose of the current research is to study the relation between emotional intelligence and career development of public employees. The research was conducted on employees from a Romanian selected public organization. Methods: we used a questionnaire distributed online to all the employees from the selected public institution. Data was centralized and processed with EXCEL applications. Findings: the results of the study show the importance of developing employees' emotional intelligence in order to better manage their career development. The research contributed new and valuable insights, as the understanding of developing the association between emotional intelligence and career development could be helpful to the top management in the development of public organizations HR practices so as to ensure high achievements of public sector employees' performance.

Keywords: Emotional Intelligence, career, employee, performance, public sector.

JEL Classification: D91, H11, O15

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1. Introduction

Employees are the most valuable resource of a public administrative system, and financial and material means, although they are important components in the activity of a system, they are transposed to the background in relation to human resources. Thus, the impact of emotional intelligence on the professional development of public sector employees is a new and interesting issue. Emotional intelligence is embedded in many human resource management activities, such as recruitment, where certain sets of emotional skills are required for the public sector employee, such as creative thinking or the ability to communicate with citizens, to listen to them and empathize with them. Emotional intelligence is the ability of a person to be aware of its own emotions, feelings, to identify and manage them in different situations. Managing our emotions means accurately identifying the factors or situations in which we lose focus or efficiency (Goleman, 2001). This means knowing your own moods, attitudes, preferences and being able to distinguish certain non-verbal elements of communication, so that you would always be one step ahead of others. It is important to be confident in your own strengths and to let your feelings lead you to those healthy choices that will bring success in your career. According to studies in the field (Salovey & Mayer, 1990; Jain, 2012; Coetzee & Harry, 2014, Emmerling & Cherniss, 2003; Farnia et al., 2018), people who have developed their emotional skills have the ability to act better, and make the right decisions, as compared to other individuals who do not have developed emotional skills, so they think more clearly, constructively even when they are in extreme situations or when working under stress.

2. Problem Statement

2.1. Emotional intelligence

In recent years, the concept of emotional intelligence has become more widespread and its definition continues to be constantly changing. Initially, psychologists developed this concept based on cognitive aspects, such as memory or people's ability to solve problems. In contrast, Locke (2005) proposed redefining the concept as a personality trait. This strong aspiration to a detailed knowledge of the concept has led to the elaboration of several reference tests and models (Bar-On, 1997; 2000). In the literature (Higgs, 2004; Woolfolk et al., 2008; Stough, Saklofske, & Parker, 2009; Schutte et al., 2009) there are numerous studies that address the concept of emotional intelligence. A representative example is the work of two American professors and researchers, John D. Mayer and Peter Salovey, who set out to develop an instrument to measure differences between people in terms of emotional abilities (Salovey & Mayer, 1990). The results of this study confirmed that some people are more capable at raising their own emotions, perceiving emotions as they occur, and paying special attention to those around them. Also, people with a high level of emotional intelligence have the ability to solve their personal or work problems much more easily, and so they are seen in the position of

leaders with high potential or more productive (Sabie et al. 2020). Reuven Bar-On (2000) analysed the concept emotional intelligence in terms of intrapersonal, interpersonal appearance, individual adaptability, mood and stress resistance. Instead, Goleman (1995, 1998) argues that emotional intelligence is about one's own feelings and ability to motivate oneself, to accomplish things in an inventive way, to achieve performance, managing relationships effectively.

2.2. Career development

Traditionally, the concept of career was associated with people who held management positions or well-paid jobs. Gradually, this concept evolved, applying to the entire staff of the organization and refers to the evolution of a person from one position to another. In the field of human resources from public administration, the career reflects the evolution of a civil servant, progressively and in accordance with the skills, knowledge and performance of the official, but also in accordance with the needs of the organization (Androniceanu, 2012; Manole & Nica, 2018). In view of this, the development of an employee's career in the public sector is an equally shared responsibility between civil servants and the organization. Even though human potential is the most important resource of any institution, being the one that leads to performance when proper management is practiced, many employees do not benefit from this support and do not receive adequate formal guidance. Here comes the concept of emotional intelligence, managing one's own negative emotions in discouraging situations. Lee and Kusumah (2020) stated that between two people with good skills and similar theoretical and practical skills, the difference will be made by emotional intelligence, the employee will either have self-control over his/her own emotions and adapt to existing circumstances, or will be overwhelmed by the situation and will be demoralized.

2.3. Emotional intelligence in career development

Although we are not aware, emotional intelligence plays an important role in many areas of our lives. Various types of careers focus mainly on those responsibilities that can be achieved through individual or teamwork, the tasks being well structured and pre-established. It is about applying technical skills, which are relatively easy to learn and measure. According to HR professionals, trainers and recruitment teams, emotional intelligence can make the difference between those who make optimal career decisions and those who make the wrong choices. Watkin (2002) states that emotional intelligence leads to successful recruitment decisions. Goleman (1995) argues that emotional intelligence should be used as a determinant of hiring decisions based on his assertions about the link between emotional intelligence and performance. Fox and Spector (2000) also claim that emotional intelligence is important in the recruitment and selection processes. The authors argue that the emotional management skills associated with emotional intelligence contribute to the ability of interviewees to adjust their emotional state during interviews. Studies have also shown that the positive affectivity of the interviewee

plays a major role in influencing the employer's decision. Other researches (Isen & Baron, 1991; Nouri & Mousavi, 2020) demonstrated that employees who have been able to regulate their mood in an organization, have a significant advantage in obtaining promotions, respectively in career development. In the case of a civil servant, the position may require the ability to be empathetic and to understand the needs of the citizen / client (Nica & Popescu, 2010). People who have a low level of emotional intelligence don't have this ability to "read" people, so they will consider these positions difficult or even unsatisfactory. The association of emotional intelligence and effective leadership qualities was first suggested by Goleman (1998) in his book, which examinates the impact of emotional intelligence in the workplace environment. Other researchers specifically identify emotional intelligence, considering that it contributes to effective (George, 2000), transformational (Ashkanasy & Tse, 2000) and emerging (Wolff, Pescosolido, & Druskat, 2002) leadership. Humphrey (2002, 2005) argues that there is a strong link between emotions and leadership. He indicates that specific aspects of leadership are quantified by emotional abilities. Feelings generated at work, such as fear of failure, anxiety or worries, have critical information about how we feel. For example, if a superior has higher demands at work, at a level where civil servants feel tense, they will either mobilize and ignore these fears, or they will be overwhelmed by worries and fail to resolve the tasks in time. When such worries arise, they can be used constructively. All feelings at work are extremely important, not just fear or apprehensions. The feeling of success, for example, is one of satisfaction at work. Managers who have an increased level of emotional intelligence make the right, satisfying decisions for the team, using their emotions creatively. In order to perfect their thinking, they observe things objectively, they control their emotions, even if they are tempted to let themselves be led by them (Burcea & Sabie, 2020). Also, employees who have a high level of emotional intelligence, feel and know how to empathize with others. Thus, emotional intelligence is a key benchmark in working with people, and the skills of emotionally intelligent people, such as flexibility, conflict management, persuasion, and social reasoning, are becoming increasingly important and contribute to career development (Mandell). & Pherwani, 2003).

3. Research Questions/Aims of the research

The aim of the research is to study the impact of emotional intelligence in the career development of public sector employees, the way in which emotional intelligence is a key factor in career advancement. The main point from which the research starts is that there are people who have outstanding professional results, due to the emotional intelligence skills with which they were born or which they have developed over time.

The research hypotheses are:

H 1. There is a positive relationship between emotional intelligence and the career development of civil servants.

H 2. The career development chances for a civil servant are higher, if his/her emotional intelligence level is above average.

H 3. Emotional intelligence is the only key factor in the development of civil servants' careers.

H 4. Employees with a low level of emotional intelligence will not advance more slowly in their career.

It is hypothesized that people with above-average emotional intelligence will be able to communicate effectively with citizens, and will get along better with co-workers, so that they will have better professional results. Also, for the purpose of the research it is necessary to observe a difference between people with below average emotional intelligence level and those with above average emotional intelligence level. Emotional intelligence is a distinctive ability and can lead to success for an employee in an organization.

4. Research Methods

In order to achieve this goal, we conducted a quantitative study, respectively, a questionnaire-based survey, allowing us to analyse the relationship between emotional intelligence and employee's career development, within the Bucharest District 2 City Hall. In order to establish the sample size, we worked in the conditions of the existence of a possibility to guarantee the results in proportion of 95%, with a margin of error of approximately +/- 3%. The questionnaire was distributed online to the employees of the Bucharest District 2 City Hall due to the physical restricted contact (COVID-19 pandemic) and was completed between May and June 2020 by 119 respondents. Following the processing of the database, 98 fully completed questionnaires were validated. The presented results are part of a larger research project.

5. Findings

In the first section we present demographic data, like: the gender of respondents, the age of employees, the last form of education completed, experience (tenure) in public service and the type of position held.

Table 1. Main characteristics of the sample

Item	Categories	Number	Percent
Gender	Men	25	25,51
	Women	73	74,41
Age	Under 30 years old	28	28,56
	Between 30 to 40 years old	43	43,88
	Between 40 to 50 years old	12	12,24
	More than 50 years old	15	15,31
Education	High school and professional	17	17,35
	Bachelor degree	51	52,04
	Master degree	26	26,53
	PhD and post-university	4	4,08
Tenure in organization	Under 5 years	15	15,31
	Between 5 to 10 year	41	41,84
	Between 10 to 15 years	26	26,53
	More than 15 years	16	16,33
Position in organization	Management level	17	17,35
	Non-management level	81	82,65

Source: our survey among 98 respondents, conducted in May – June 2020

As it has been shown in Table 1, 26% of the respondents were men and 74% were women. In terms of age, 29% of respondents were under 30 years, 44% between 30 to 40 years, 12% between 40 to 50 years and 15% more than 50 years. In terms of tenure in organization, 15% of the respondents had under 5 years, 42% between 5 to 10 years, 27% between 10 to 15 years, 16% more than 15 years. In terms of education, 17% of the respondents held a high school diploma, 52% held a bachelor degree and 31% held master's degree and higher.

The second section presents data on a number of factors that can either be a barrier or a key element in the career development of civil servants.

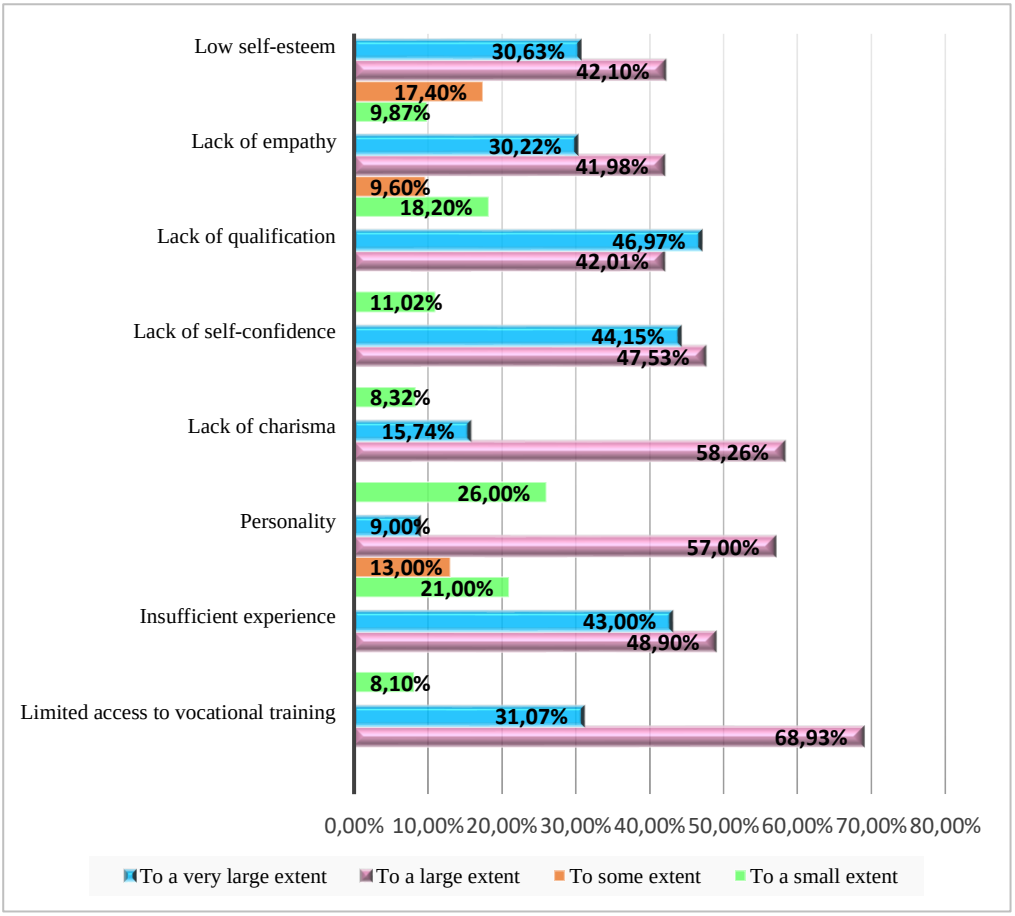

Figure 1. Factors that represent barriers in career development of public employee
Source: our survey among 98 respondents, conducted in May – June 2020

In Figure 1 we see a number of factors such as: low self-esteem, lack of empathy or insufficient experience, factors that are an obstacle to career development or promotion. We will analyse each factor separately, to see to what extent civil servants consider these factors as barriers to the development of their careers. By low self-esteem, we understand the value we give each other and that comes from a flawed self-image. Most respondents stated that self-esteem is largely (≈73%) a barrier to career development, while only 10% granted little importance to this aspect. Lack of empathy, of the way in which we, as individuals, understand what those around us live, according to the respondents, represents, to a great and very great extent, a barrier in career development. Regarding the lack of qualification, it is very important, as over 88% of respondents stated that it is to a large and very large extent, an obstacle to career development. Self-confidence, along with charisma, are in the respondents' opinion important barriers to career development, but the biggest obstacles are limited experience and access to training.

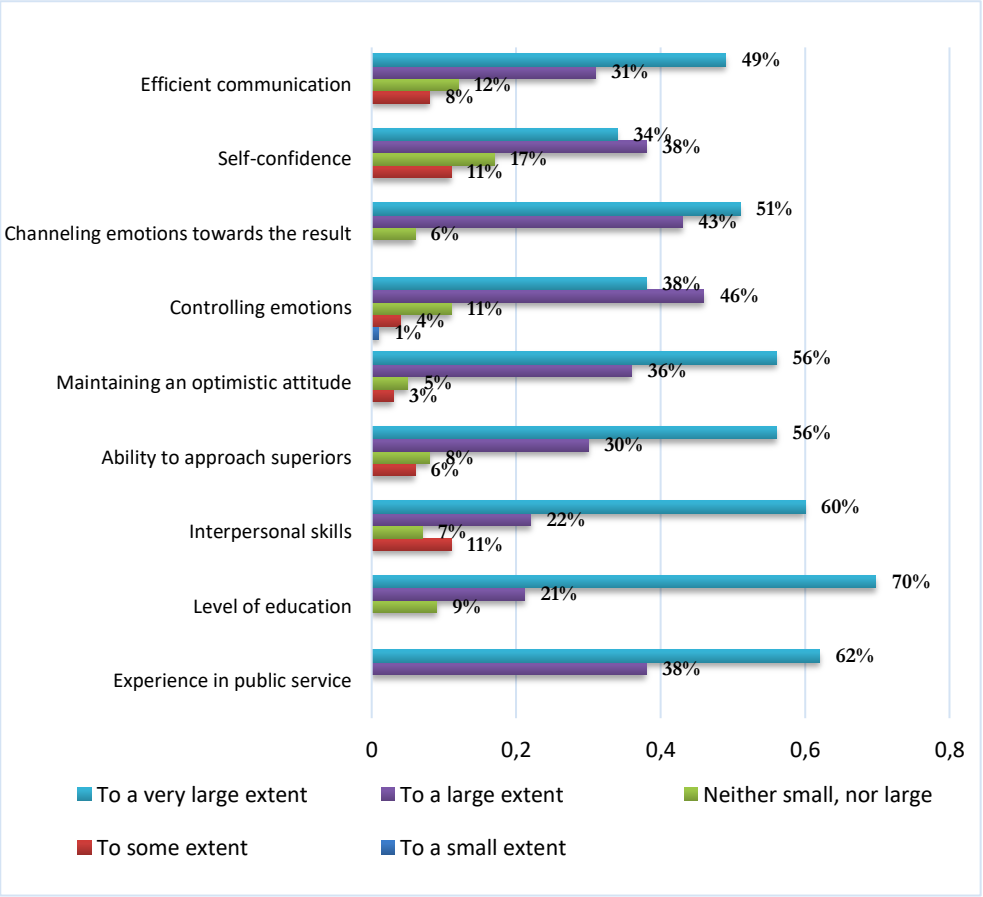

Figure 2. Key elements in career development of public employee
Source: our survey among 98 respondents, conducted in May – June 2020

In Figure 2 we present which are the factors of a successful career in civil servants' opinion. Experience in the public service, along with the level of education, maintaining an optimistic attitude and channelling emotions towards the result are key factors that ensure success and contribute greatly to the development of civil servants' career.

Next, we present the results regarding the respondents' perception about the role that emotional intelligence has in managing emotions, relationships between colleagues, but also whether or not it contributes to career development.

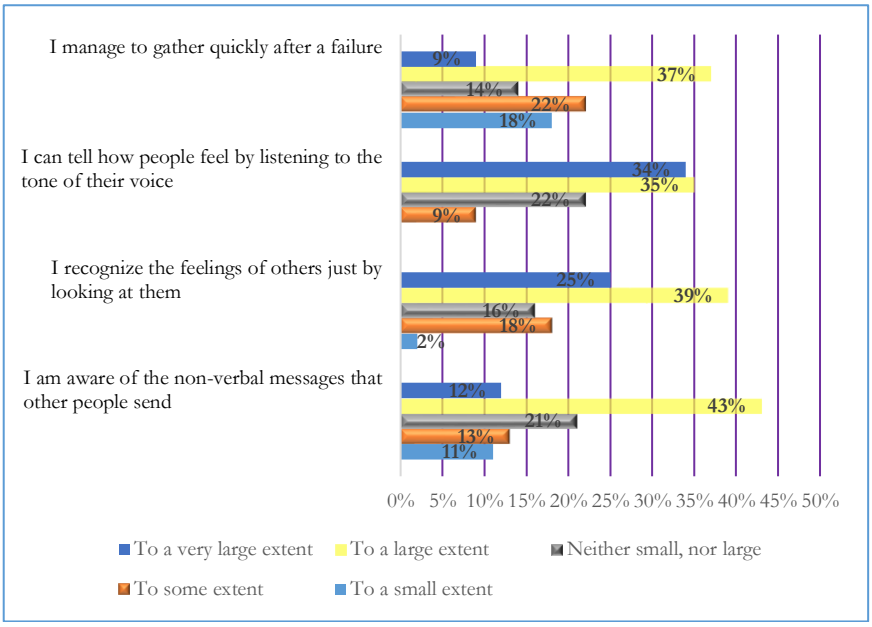

Figure 3. Respondents' perception of managing emotions at work
Source: our survey among 98 respondents, conducted in May – June 2020

Figure 3 shows that more than half of Bucharest District 2 City Hall employees are aware to a large and very large extent of non-verbal messages sent by other people (55%), 64% of employees realize the feelings of work colleagues just by looking at them, and the majority of respondent employees (69%) said they can tell how people feel by listening to the tone of their voice. Less than half of the respondents (46%) stated that they have the ability to easily overcome a failure, most of them encountering difficulties.

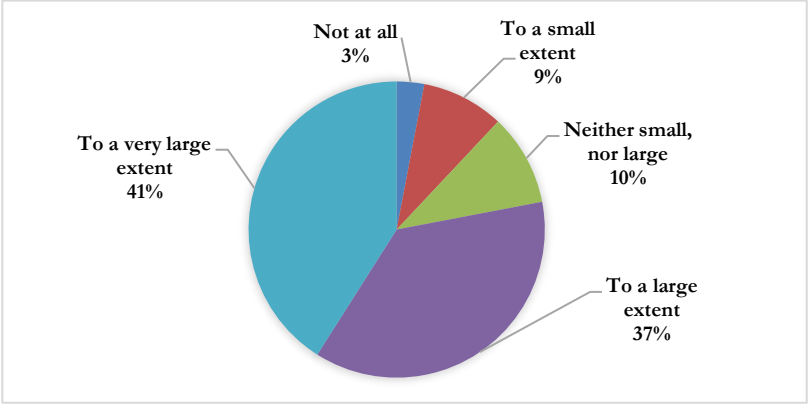

Figure 4. The extent to which the ability to effectively manage own emotions influences the career development of civil servants
Source: our survey among 98 respondents, conducted in May – June 2020

Analysing Figure 4 we can observe that 78% of employees consider the ability to effectively manage their emotions as playing a significant role in career development. To the question "To what extent do you think the following statements about managing your own emotions at work suit you?" over 59% of the respondents answered that they fail to stay calm and relaxed at work, while about 41% manage their emotions at work to a large and very large extent. At the same time, they are not convinced that they will be able to solve their work tasks when they face emotional challenges. In general, when employees are in a negative situation, 31% of respondents said that to a large and very large extent they try to look for and carry out activities that make them happy, and only 43% listen carefully to all parties and analyse various aspects of the problem before concluding and adopting a certain decision or behaviour. The results presented above show that most respondents fail to effectively manage their emotions at work.

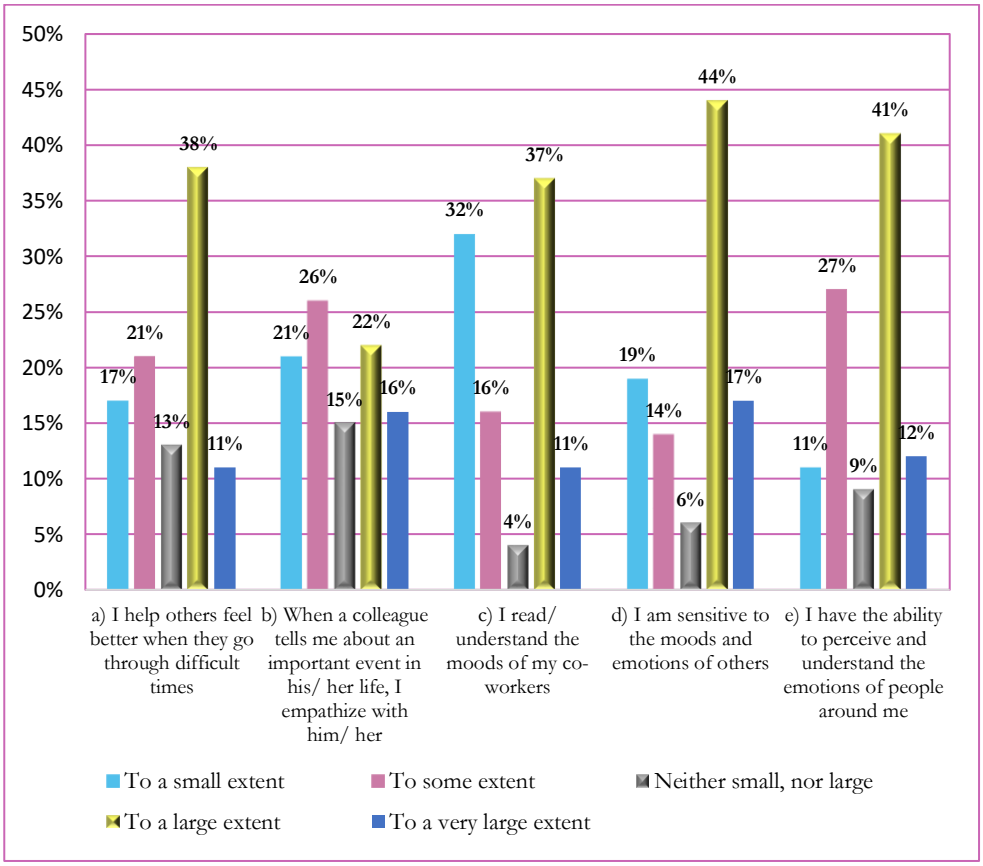

Figure 5. The degree to which employees perceive and manage the emotions of co-workers
Source: our survey among 98 respondents, conducted in May – June 2020

According to the results shown in Figure 5, we can make the following statements: over 61% of respondents are sensitive to the emotions and moods of others to a large and very large extent, 53% of employees believe that they have the ability to perceive and understand the emotions of others, and only 62% of respondents stated that they empathize with colleagues to a small and very small extent regarding the events in their lives.

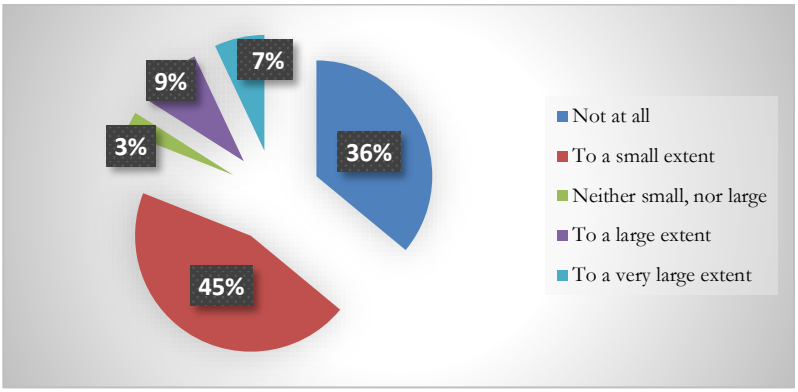

Figure 6. The degree to which the ability to understand the emotions of others influences career development

Source: our survey among 98 respondents, conducted in May – June 2020

According to Figure 6, in respondents' opinion, the career development is influenced to a small extent by the ability to understand the emotions of those around them. Only 16% of employees said that this ability can greatly and very much influence their career. To the question "To what extent do you agree with the following statements regarding the management of emotions in employment relationships?" employees answered that to a large and very large extent (60%), they tend to assume their own mistakes at work. At the same time, 30% of employees stated that they assume their mistakes to some extent, and 10% of them do not admit when they make mistakes.

In terms of accepting negative or constructive feedback, only 69% of respondents stated that they accept criticism to a large and very large extent. The rest of the employees appreciated that this statement suits them to a small extent, as they hardly accept criticism (23%), and only 8% of the employees accept negative feedback to some extent. Regarding the capacity for self-control in times of crisis, 22% of respondents consider that they have this capacity to a small extent, while 47% of respondents said that they fit the statement on managing negative moods to some extent. Of course, the percentage of 31% is represented by employees who manage, to a large and very large extent, to calm down quickly when they are upset or nervous.

6. Conclusions

Following the interpretation of the results, we can conclude that the employees of the Bucharest District 2 City Hall have an average and slightly above average level of emotional intelligence, and consider this concept as a basic one in the development of their career. According to the data presented, we can say that in addition to the lack of aspects related to emotional intelligence, such as lack of empathy, charisma, personality, self-confidence, or low self-esteem, which are limits in their professional development, reduced access to vocational training is, to a much greater extent, an obstacle to the growth of employees from a professional point of view. Also, emotional intelligence alone cannot contribute to success, but it must be accompanied by cognitive intelligence and practical skills. Most respondents stated that the lack of qualification matters to a great extent when it comes to career promotion. Other key elements, which respondents considered to be important in career development, are related to both emotional intelligence and individual performance arising from professional/practical skills. Therefore, the respondents consider that, at the base of the career development, in order to be successful within the organization, a high level of education and a considerable work experience are needed. There are cases, however, in which employees met these criteria, turning it into personal goals, but they have not managed to develop their career until after a lot of effort. On the other hand, there are employees who, although they may not have a high level of education, have distinguished themselves through effective communication, maintaining a positive attitude, self-confidence, the ability to approach superiors and manage crisis situations.

All these aspects listed above are related to what emotional intelligence means and have in mind a good management of emotions in order to achieve a pre-established result. Most employees believe that the ability to manage your emotions at work influences professional activity and career advancement to some extent.

Given the above, we can conclude that there is a relationship between emotional intelligence and career development of public service employees. Thus, hypothesis 1 according to which there is a positive relationship between IE and the career development of civil servants was confirmed. The relationship is not significant, as the training of civil servants and experience prevail.

Hypothesis 2 was confirmed, as most employees have an average and above average level of emotional intelligence, managing to develop their career also due to IE skills, not only because of the training and experience gained.

Hypothesis 3 which states that IE is the only key factor in the development of civil servants' careers has been rejected, because emotional intelligence is just a trait that helps them advance in their careers. Along with IE, career development of public employees provides the following requirements: demonstration of the set of professional skills required by the job, the acquisition of theoretical knowledge and practical skills necessary for public office, respectively, seniority in the specialty of studies necessary for public office.

Hypothesis 4 was confirmed by the fact that employees' practical skills and cognitive intelligence help them advance in their careers at some point, but the

factor that differentiates between two competent and well-trained employees is emotional intelligence, the trait that turns a simple employee into a leader, even though informal.

The main research limits of this study are related to the respondents' number, their mental discomfort created by the external situation caused by the globally declared pandemic with COVID-19 and the disproportion given by the type of respondents (man and women).

The present study contributes to previous research, reaffirming the way in which emotional intelligence increases the confidence of public sector employees in their own strength to cope with different situations (especially political decisions and changes). Therefore, we can conclude that emotional intelligence adds value to human resource professionals, who are constantly looking for ways to advance their practice.

Acknowledgment

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References

[1] Androniceanu, A. (2012). Civil Servants Career Development in the Romanian Central Public Administration. *Revista de Administratie si Management Public*, pp. 43-52.

[2] Ashkanasy, N. M., & Tse, B. (2000). Transformational leadership as management of emotion. In N. M. Ashkanasy, C. E. J. Härtel, & W. Zerbe (eds), *Emotions in the workplace: research, theory, and practice.* Westport, CT: Quorum Books, pp. 221-235.

[3] Bar-On, R. (1997). *Bar-On Emotional Quotient Inventory (EQ-i): Technical manual*. Toronto: Multi-Health Systems.

[4] Bar-On, R. (2000). *Emotional and Social Intelligence: Insights from the Emotional Quotient Inventory, The Handbook of Emotional Intelligence*, pp. 363-388.

[5] Burcea, S. G., Sabie, O. M. (2020). Is emotional intelligence a determinant factor for leader's skills development? Essential literature perspectives. *Management and Economics Review*, 5(1), pp. 68-77.

[6] Coetzee, M., & Harry, N. (2014). Emotional intelligence as a predictor of employees' career adaptability. *Journal of Vocational Behavior*, 84(1), pp. 90-97.

[7] Emmerling, R. J., Cherniss, C. (2003). Emotional intelligence and the career choice process, *Journal of career assessment*, 11(2), pp. 153-167.

[8] Farnia, F., Nafukho, F. M., Petrides, K. V. (2018). Predicting career decision-making difficulties: the role of trait emotional intelligence, positive and negative emotions, *Frontiers in Psychology*, 9(1107).

[9] Fox, S., & Spector, P. E. (2000). Relations of emotional intelligence, practical intelligence, General intelligence, and trait affectivity with interview outcomes: It's not all just "G", *Journal of Organizational Behaviour*, 21, pp. 203-220.

[10] George, J. M. (2000). Emotions and leadership: The role of emotional intelligence. *Human Relations*, 53, pp. 1027-1055, doi: 10.1177/0018726700538001.

[11] Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ*. New York: Bantam Books. Goleman, D. (1998). *Working with Emotional Intelligence.* Bantam Books.

[12] Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Book, 400 p.

[13] Goleman, D. (2001). An EI-Based Theory of Performance. In C. Cherniss, & D. Goleman (Eds.), *The Emotionally Intelligent Workplace*, pp. 27-44, San Francisco, CA: Jossey-Bass.

[14] Higgs, M. (2004). A study of the relationship between emotional intelligence and performance in UK call centres. *Journal of Managerial Psychology*, 19(4), pp. 442-454.

[15] Humphrey, R. H. (2002). The many faces of emotional leadership. *The Leadership Quarterly*, 13, pp. 493-504.

[16] Humphrey, R. H. (2005). Empathy, emotional expressiveness, and leadership. *Proceedings of the Southern Management Association*, pp. 1-6, Charleston, SC.

[17] Isen, A. M., & Baron, R. A. (1991). Positive affect as a factor in organizational behaviour. *Research in Organizational Behaviour*, 13, pp. 1-53.

[18] Jain, A. K. (2012). Moderating Effect of Impression Management on the Relationship of Emotional Intelligence and Organizational Citizenship Behaviour, *Journal of Behavioural and Applied Management*, 13(2), pp. 86-107.

[19] Lee, C. W., Kusumah, A. (2020). Analysis of the influence of the emotional, intellectual and spiritual intelligence on employee performance with work motivation as a moderating variable, *Management and Economics Review*, 5(1), pp. 51-67.

[20] Locke, E. A. (2005). Why emotional intelligence is an invalid concept. *Journal of Organizational Behavior*, 26(4), pp. 425-431. https://doi.org/10.1002/job.318.

[21] Mandell, B., & Pherwani, S. (2003). Relationship between emotional leadership style: A gender comparison. *Journal of Business and Psychology*, 17(3), pp. 387-404.

[22] Manole, C., & Nica, E. (2018). *Managementul resurselor umane în administrația publică*, ed. 3 rev., Editura ASE, București, p. 290.

[23] Mayer, J. D., & Salovey, P. &. (2004). *Emotional intelligence: Theory, findings, and implications. Psychological Inquiry.*

[24] Nica, E., Popescu, Gh. (2010). Emphasis of interconnection between the public system of granting salary and incentives and the civil servant's performance indicators. *Revista de Administrație și Management Public*, 15, pp. 121-127.

[25] Nouri, B. A., & Mousavi, M. M. (2020). The effect of career anchors on human resource development, *Management Research and Practice*, 12(3), pp. 5-20.

[26] Sabie, O. M., Briscariu, R. M., Pirvu, C., Burcea, S. G., Gatan, L. M. (2020). The relationship between emotional intelligence and human resources employee performance: a case study for Romanian companies, *Management Research and Practice*, 12(3), pp. 45-59.

[27] Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. Imagination, Cognition and Personality, 9(3), pp. 185-211.

[28] Schutte, N. S., Malouff, J. M., Bhullar, N. (2009). The assessing emotions scale. In C. Stough, D. H., Saklofske, & J. D. A. Parker (Ed) *Assessing emotional intelligence: Theory, research, and applications*, pp. 119-134, New York, NY: Springer.

[29] Stough, C., Saklofske, D. H., Parker, J. D. A. (Ed) (2009). *Assessing emotional intelligence: Theory, research, and applications. Springer*.

[30] Watkin, C. (2002). Developing Emotional Intelligence. *International Journal of Selection and Assessment*, 2, pp. 89-92.

[31] Wolff, S. B., Pescosolido, A. T., & Druskat, V. U. (2002). Emotional intelligence as the basis of leadership emergence in self-managing teams. *The Leadership Quarterly*, 13, pp. 505-522.

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Computationally Networked Urbanism and Big Data-driven Decision-Making Processes for Internet of Things-enabled Smart Cities

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Abstract

The objective of this paper is to integrate and inspect current evidence on Internet of Things-enabled smart cities. Using and replicating data from ESI ThoughtLab, KPMG, McKinsey, and Osborne Clarke, we performed analyses and made estimates regarding computationally networked urbanism and big data-driven decision-making processes. Data were inspected by harnessing structural equation modelling.

Keywords: urbanism, big data, Internet of Things, smart, city.

JEL Classification: L81, O14, O32, Q55

1. Introduction

Smart city driving forces mobilize the advancement and deployment of networked digital technologies into a rhetoric and rationale in which the latter are furthered as well-founded, feasible ways out to the discomforts of urban life, clarifying social matters, managing local and regional economies, and facilitating civic projects (Kitchin et al., 2019).

2. Problem Statement

Cities of scale harness various smart city technologies (Atwell & Lăzăroiu, 2019; Coatney, 2019; Eysenck et al., 2019; Harrower, 2019; Kenrick et al., 2019; Pera, 2019; Slaby, 2019) to organize urban services and infrastructures (Atwell et al., 2019; Durkin, 2019; Fielden et al., 2019; Hollowell et al., 2019; Krech, 2019;

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Popescu Ljungholm, 2019a, b; Trettin et al., 2019), and to regulate public-sector operations. Smart cities are stimulated by and replicate certain patterns of power (Bekken, 2019; Durst, 2019; Gray-Hawkins et al., 2019; Hyers, 2019; Lafferty, 2019; Sheller, 2019; Wingard, 2019) and governance (Byrne, 2019; Eskridge, 2019; Groener, 2019; Keane, 2019; Lyakina et al., 2019; Sion, 2019), also modeling formations of economic advancement (Kitchin et al., 2019).

3. Research Questions/Aims of the research

Q1 The big data-driven infrastructure bolstering smart cities may operate as a platform for constant economic growth. Q2 Smart cities are mainly designed to generate consumers, that is to articulate and cover specific markets with the capacity and the intention to meet the expense of products and services. Q3 Urban agglomerations are instrumental in terms of the development of the innovation process and of determining suitable markets. The objective of research is to prove that smart cities configure a regulating design for gathering data on the features and behaviours of citizens and companies in the built settings. Cities purchase smart things, systems, and platforms while supplying services and infrastructure to users. (Clark, 2020).

4. Research Methods

By using and replicating data from ESI ThoughtLab, KPMG, McKinsey, and Osborne Clarke, we performed analyses and made estimates regarding computationally networked urbanism and big data-driven decision-making processes. Data were analysed using structural equation modelling. The interviews were performed online and compiled data were weighted by important variables (age, education, geographic region, race/ethnicity, and gender) harnessing the Census Bureau's American Community Survey to represent thoroughly and unequivocally the demographic organization of the United States. Sampling errors and inspection of statistical relevance comprise the impact of weighting. Stratified sampling procedures were used and weights were redesigned not to surpass 3. Standard margins of error are +/-2% at the 95% confidence level. For tabulation grounds, percentage points are calculated roughly to the next whole number. The preciseness of the online polls was determined by resorting to a Bayesian credibility interval. Confirmatory factor analysis was used to examine the consistency and cogency of measurement tools. An Internet-based survey software program was handled for the distribution and inspection of responses.

5. Findings

As a data-driven industry, smart cities concentrate on the design, advancement, and arrangement of an evolving kind of cross-platform, service-assimilated technology, outcomes that improve infrastructure operation and diversify services. Urban innovation networks function as the pivotal drivers furthering technology and enabling data exchange. Big data-driven urban innovation networks facilitate

interaction among urban operating systems and the dissemination of policy knowledge by use of horizontal networks. Urban knowledge insists on the capacity to collect, concatenate, process, and inspect massive volumes of datasets concerning public sector practices, assisting in the carrying out, operation, and design of big data-driven areas, and in articulating elaborate and networked systems of platforms (Clark, 2020). (Tables 1-10)

Table 1. Most required alterations to enhance smart cities' living setting (%)

Availability of affordable housing	56
Reducing traffic congestion and improving transport/mobility	80
Improvement of recycling/waste management and infrastructure for recyclable waste collection	79
Availability of green spaces/parks	74
A living environment that is more accommodating to elderly and disabled residents	68
Reducing pollution	76
Reducing the carbon footprint	74
Urban redevelopment	65

Sources: KPMG; our survey among 4,800 individuals conducted February 2020.

Table 2. Actions required to enhance transportation and mobility in data-driven urban areas (%)

Improved walkability and safety for pedestrians	76
Constructing more rail and underground transport links	78
Building infrastructure for electric vehicles and providing incentives to electric vehicle owners	79
Tighter regulation of private cars and vehicles	75
Constructing more bicycle lanes/bicycle paths	77
Installing cameras/sensors to record traffic violations	76
Smart tolls and smart parking	76
Studying feasibility of driverless transportation models	78

Sources: KPMG; our survey among 4,800 individuals conducted February 2020.

Table 3. How smart cities can cut down the expenses of living (% change in standard yearly costs)

Effects of dynamic electricity pricing, home automation, home energy and water consumption tracking	-0.8
Effects of remote monitoring, telemedicine, online care search, lifestyle wearables, integrated patient flow management	-0.7
Effects of e-hailing, car and bike sharing, congestion pricing	-0.3
Effects of digital land use and building permitting, open cadastral databases, peer-to-peer accommodation platforms	-2.6
Effects of home security systems, personal safety applications	0.8

Sources: McKinsey; our estimates.

Table 4. To what degree do you think that project finance structures will be used to fund the roll-out of smart technology in the next three years? (%)

Strongly agree	18
Agree	60
Disagree	19
Strongly disagree	3

Sources: Osborne Clarke; our survey among 4,800 individuals conducted February 2020.

Table 5. Key actions to accelerate education development in smart cities (%)

Encouraging continuous education/lifelong learning	64
Developing education programs that encourage creativity and risk-taking	66
More funding for education and research in science, technology, engineering, and mathematics (STEM) disciplines	70
More smart city and innovation technology training for professionals at different levels	72
Developing education programs/courses/training in artificial intelligence, data analytics and machine learning	71
Providing mandatory coding/programming training starting from primary school	68
Attracting top scholars and professors to do research/teach in your city	64

Sources: KPMG; our survey among 4,800 individuals conducted February 2020.

Table 6. How smart cities can configure an innovative kind of digital commons (%)

Impact of digital platforms for making local connections *% feeling connected to their local community*	
Baseline	28
Impact of local connection platforms	21
Resulting baseline	49
Impact of local citizen engagement applications *% feeling connected to their local government*	
Baseline	18
Impact of local citizen engagement applications	27
Resulting baseline	45

Sources: McKinsey; our survey among 4,800 individuals conducted February 2020.

Table 7. How smart city applications can be instrumental in articulating a safer urban environment (%)

Fatalities *% decrease in addressed fatalities by application*	
Gunshot detection	2.8
Predictive policing	4.9
Real-time crime mapping	3.6
Personal alert applications	0.7
Data-driven building inspections	0.8
E-hailing (private and pooled)	0.7
Congestion pricing	1.4
Intelligent traffic signals	0.8
Crime incidents *% decrease in incidents by application*	
Predictive policing	12.5
Home security systems	14.3
Real-time crime mapping	12.4
Smart surveillance	5.7
Personal alert applications	4.4
Smart streetlights	5.3
Emergency response *% decrease in average emergency response time by application*	
Emergency response optimization	21.1
Personal alert devices	1.6
Smart surveillance	4.8
Real-time crime mapping	2.8
Gunshot detection	0.8
Home security systems	0.6
Intelligent traffic signals	8.7

Sources: McKinsey; our estimates.

Table 8. What are the upsides that your urban area has obtained from its smart city investments? (%)

Reduce budget deficits	264
Reduce capital costs	67
Improve competitiveness	56
Promote economic development	54
Improve sustainability/resiliency	37

Sources: ESI ThoughtLab; our estimates.

Table 9. Where residents think that smart cities should make transportation investments (%)

Using data to improve transportation routes	66
Improving the speed/reliability of public transportation	63
Using real-time data to respond quickly to traffic issues	62
Offering payment accounts for all transportation modes	62
Sharing data with public on traffic, roads, etc.	58
Providing more travel options (bikes, ferries, etc.)	57
Providing electric vehicle charging stations	56
Using my data to personalize travel suggestions	55
Planning for autonomous vehicles	54
Exploring drones/driverless trucks for moving goods	51

Sources: ESI ThoughtLab; our survey among 4,800 individuals conducted February 2020.

Table 10. How smart cities can be sustainable and clean (%)

GHG emissions, % decrease by application	
Building automation systems	2.6
Home energy automation systems	2.7
Dynamic electricity pricing	1.9
Distribution automation systems	0.8
Energy consumption tracking	0.6
Smart streetlights	0.3
Demand-based microtransit	0.5
Intelligent traffic signals	0.8
Congestion pricing	0.9
Integrated multimodal information	0.8
Smart parking	0.6
Smart parcel lockers	0.7
Bike sharing	0.6
Parcel load pooling	0.5
Real-time public transit information	0.6
E-hailing (private and pooled)	0.4
Car sharing	0.3
Digital tracking and payment for waste disposal	0.6
Waste collection route optimization	0.3
Water consumption tracking	0.4
Leakage detection and control	0.3
Water, % reduction in water consumption by application	
Water consumption tracking	7.6
Building automation systems	1.5
Leakage detection and control	15.5
Smart irrigation	0.6
Waste, % reduction in unrecycled waste by application	
Digital tracking and payment	13.8

Sources: McKinsey; our estimates.

6. Conclusions

By collecting and processing digital information concerning particular urban undertakings, mobilities, and infrastructures, cutting-edge smart big data-driven technologies make cities more manageable, coherent, sustainable, and safe. In smart cities, urban activity is made coherent and responsive by the use of data gathering and mining, by harnessing improved digital infrastructure, instantaneous information, and ubiquitous computing to further performance in city administration and to enhance the standard of living for citizens. Implementation of computerized systems, interconnected sensors, and Internet of Things are instrumental for the coherence and optimization of data-driven decision making in sustainable, digitally networked urban areas (Halegoua, 2020).

References

[1] Atwell, G. J., & Lăzăroiu, G. (2019). Are autonomous vehicles only a technological step? The sustainable deployment of self-driving cars on public roads. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 22-28.

[2] Atwell, G. J., Kicova, E., Vagner, L., & Miklencicova, R. (2019). Parental engagement with social media platforms: Digital mothering, children's online privacy, and the sense of disempowerment in the technology-integrated society. *Journal of Research in Gender Studies*, 9(2), pp. 44-49.

[3] Bekken, G. (2019). The algorithmic governance of data driven-processing employment: Evidence-based management practices, artificial intelligence recruiting software, and automated hiring decisions. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 25-30.

[4] Byrne, S. (2019). Remote medical monitoring and cloud-based Internet of Things healthcare systems. *American Journal of Medical Research*, 6(2), pp. 19-24.

[5] Clark, J. (2020). *Uneven innovation: The work of smart cities*. New York, NY: Columbia University Press.

[6] Coatney, K. (2019). Cyber-physical smart manufacturing systems: Sustainable industrial networks, cognitive automation, and big data-driven innovation. *Economics, Management, and Financial Markets*, 14(4), pp. 23-29.

[7] Durkin, K. (2019). Artificial intelligence-driven smart healthcare services, wearable medical devices, and body sensor networks. *American Journal of Medical Research*, 6(2), pp. 37-42.

[8] Durst, M. (2019). Internet of Things-enabled smart governance and the sustainable development of innovative data-driven urban ecosystems. *Geopolitics, History, and International Relations*, 11(2), pp. 20-26.

[9] Eskridge, M. (2019). Falling in love with algorithmic compatibility in a digital dating landscape: Sexually affective data, networked intimacy, and online gendered identity constructions. *Journal of Research in Gender Studies*, 9(2), pp. 92-98.

[10] Eysenck, G., Kovalova, E., Machova, V., & Konecny, V. (2019). Big data analytics processes in Industrial Internet of Things systems: Sensing and computing technologies, machine learning techniques, and autonomous decision-making algorithms. *Journal of Self-Governance and Management Economics*, 7(4), pp. 28-34.

[11] Fielden, A., Michalkova, L., Vrbka, J., & Lyakina, M. (2019). Smart sustainable data-driven manufacturing: Cyber-physical production systems and Internet of Things sensing networks. *Journal of Self-Governance and Management Economics*, 7(4), pp. 7-13.

[12] Gray-Hawkins, M., Michalkova, L., Suler, P., & Zhuravleva, N. A. (2019). Real-time process monitoring in Industry 4.0 manufacturing systems: Sensing, smart, and sustainable technologies. *Economics, Management, and Financial Markets*, 14(4), pp. 30-36.

[13] Groener, M. (2019). Geolocation-based phone dating apps, digital intimacies, and social matching systems in the online sexual marketplace. *Journal of Research in Gender Studies*, 9(2), pp. 85-91.

[14] Halegoua, G. R. (2020). *Smart cities*. Cambridge, MA: The MIT Press.

[15] Harrower, K. (2019). Algorithmic decision-making in organizations: Network data mining, measuring and monitoring work performance, and managerial control. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 7-12.

[16] Hollowell, J. C., Kollar, B., Vrbka, J., & Kovalova, E. (2019). Cognitive decision-making algorithms for sustainable manufacturing processes in Industry 4.0: Networked, smart, and responsive devices. *Economics, Management, and Financial Markets*, 14(4), pp. 9-15.

[17] Hyers, D. (2019). Sensor networks and intelligent automation systems for big data-driven smart manufacturing in cyber-physical connected environments. *Journal of Self-Governance and Management Economics*, 7(4), pp. 14-20.

[18] Keane, E. (2019). Networked information-driven technologies for cyber-physical system-based smart manufacturing. *Journal of Self-Governance and Management Economics*, 7(4), pp. 21-27.

[19] Kenrick, N., Svabova, L., & Nica, E. (2019). Real-time health-related data, wearable medical sensor devices, and smart cyber-physical systems. *American Journal of Medical Research*, 6(2), pp. 25-30.

[20] Kitchin, R., Coletta, C., Evans, L., & Heaphy, L. (2019). Creating smart cities. In C. Coletta, L. Evans, L. Heaphy, and R. Kitchin (Eds.), *Creating smart cities*, pp. 1-18, New York, NY: Routledge.

[21] Krech, S. (2019). Medical big data analytics and smart Internet of Things-enabled mobile-based health monitoring systems. *American Journal of Medical Research*, 6(2), pp. 31-36.

[22] Lafferty, C. (2019). Sustainable Internet-of-Things-based manufacturing systems: Industry 4.0 wireless networks, advanced digitalization, and big data-driven smart production. *Economics, Management, and Financial Markets*, 14(4), pp. 16-22.

[23] Lyakina, M., Heaphy, W., Konecny, V., & Kliestik, T. (2019). Algorithmic governance and technological guidance of connected and autonomous vehicle use: Regulatory policies, traffic liability rules, and ethical dilemmas. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 15-21.

[24] Pera, A. (2019). Towards effective workforce management: Hiring algorithms, big data-driven accountability systems, and organizational performance. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 19-24.

[25] Popescu Ljungholm, D. (2019a). The safety and reliability of networked autonomous vehicles: Ethical dilemmas, liability litigation concerns, and regulatory issues. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 9-14.

[26] Popescu Ljungholm, D. (2019b). Autonomous car regulation in the smart transportation infrastructure: Ethical issues, legal liabilities, and privacy concerns. *Geopolitics, History, and International Relations*, 11(2), pp. 7-12.

[27] Sheller, T. (2019). Datafied urban governance: Real-time data sustainability, smart digital technologies, and the citizen-driven Internet of Things. *Geopolitics, History, and International Relations*, 11(2), pp. 13-19.

[28] Sion, G. (2019). Commodifying intimate relationships through geosocial networking mobile apps: Data-driven dating, sexual sociality, and online body objectification. *Journal of Research in Gender Studies*, 9(2), pp. 78-84.

[29] Slaby, C. (2019). Decision-making self-driving car control algorithms: Intelligent transportation systems, sensing and computing technologies, and connected autonomous vehicles. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 29-35.

[30] Trettin, C., Lăzăroiu, G., Grecu, I., & Grecu, G. (2019). The social sustainability of citizen-centered urban governance networks: Sensor-based big data applications and real-time decision-making. *Geopolitics, History, and International Relations*, 11(2), pp. 27-33.

[31] Wingard, D. (2019). Data-driven automated decision-making in assessing employee performance and productivity: Designing and implementing workforce metrics and analytics. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 13-18.

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Networked Digital Technologies and Urban Big Data Analytics for Internet of Things-enabled Smart Governance

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Abstract

By employing recent research results covering Internet of Things-enabled smart governance, and building our argument by drawing on data collected from Black & Veatch, ESI ThoughtLab, KPMG, McKinsey, and Osborne Clarke, we performed analyses and made estimates regarding networked digital technologies and urban big data analytics. Structural equation modeling was used to analyze the collected data.

Keywords: networked, Internet of Things, urban, governance, big data.

JEL Classification: L81, O14, O32, Q55

1. Introduction

Smart cities should be reconceptualized in cutting-edge manners that pave the way for technologies to be adopted in order to bolster urban management, while being not so much technocratic and more wide-ranging in tendency, without dealing only with the concerns of capital and elites. Setting up comprehensive and equitable smart cities brings about a rigorous reassessment of how such urban governance systems are fashioned and carried out (Kitchin et al., 2019).

2. Problem Statement

Smart cities should make data available, comprehensible, and purposeful (Ainsworth-Rowen, 2019; Drennan-Stevenson, 2019; Fincham, 2019; Gutberlet, 2019; Kral et al., 2019; Meyers et al., 2019; Noack, 2019; Zhuravleva et al., 2019a, b) while making prearranged ethical decisions with respect to the deployment of data provided by urban sensor systems. Coordinated and structured smart cities

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represent a cutting-edge architecture (Bargh, 2019; Dubman, 2019; Flygare, 2019; Gutschow, 2019; Ludbrook et al., 2019; Mircică, 2019; Olsen, 2019) which advances technological support to urban issues and a continuous endeavor to develop innovative market prospects for groundbreaking sectors (Cosgrave, 2019; Eskridge, 2019; Goethals, 2019; Heuston, 2019; Nica, 2019; Plumpton, 2019) at heterogeneous networked and jointly contingent levels of operation and production. Smart cities are both a user and a spot for the advancement, production, sharing, and consumption (Dolan-Canning, 2019; Felstead, 2019; Groener, 2019; Kovacova et al., 2019; Nica et al., 2019; Wilson, 2019) of the designed and developed manufacturing items and services (Clark, 2020).

3. Research Questions/Aims of the research

Q1 Citizens and organizations are constructed so as to acquire networks of services and objects, being the target consumerism for the sensor patterns and structures that constitute the mainstay of smart cities deployments. Q2 Smart city services are provided on the platform of an elaborate, regulated, and heterogeneous built setting. Q3 Smart city data are produced, gathered, stored, aggregated, inspected, and harnessed by a fluid set of private- and public-sector participants. The objective of research is to prove that by employing the gathered data, smart cities can develop cutting-edge products and technology-driven knowledge services that can be furnished to citizens as customers in the capitalist space economy. For smart cities, the relevance of data starts with the capacity for enhancing current services supplied to citizens and subsequently advances to furthering the setting up of innovative services (Clark, 2020).

4. Research Methods

Building our argument by drawing on data collected from Black & Veatch, ESI ThoughtLab, KPMG, McKinsey, and Osborne Clarke, we performed analyses and made estimates regarding networked digital technologies and urban big data analytics. We used the structural equation modeling to analyze the collected data. The interviews were conducted online and data were weighted by five variables (age, race/ethnicity, gender, education, and geographic region) using the Census Bureau's American Community Survey to reflect reliably and accurately the demographic composition of the United States. Sampling errors and test of statistical significance take into account the effect of weighting. Stratified sampling methods were used and weights were trimmed not to exceed 3. Average margins of error, at the 95% confidence level, are +/-2%. For tabulation purposes, percentage points are rounded to the nearest whole number. The precision of the online polls was measured using a Bayesian credibility interval. An Internet-based survey software program was utilized for the delivery and collection of responses.

5. Findings

Supervision of urban undertakings and behaviors by use of pervasive, networked sensors, responsive objects, and Internet networking catalyze urban undertakings into valuable data. Urban interactions assessed through data-driven analytics illustrate smart cities as information-driven alert and response systems, resulting in the appraisal and datafication of densely populated settings by use of surveillance technologies. Reacting to, adjusting to, and predicting citizens' needs and behaviors, smart cities are sensitized spots where digital media are purposively assimilated as infrastructure and software to gather, inspect, and share huge amounts of data in real-time to handle and inform decisions as regards urban settings and undertakings. Acquiring more algorithmically assessed data concerning public service delivery and deployment will result in optimized city services (Halegoua, 2020). (Tables 1-10)

Table 1. What benefits is your city now gaining from its smart city investments? (%)

Attracts residents and tourists	46
Better public services	57
Attracts business and private investment	62
Safety and security	57
Economic competitiveness	67
Ability to adapt and innovate	71
Productivity of city workers	73
Productivity of businesses and residents	72
Additional revenue	68
Easier commute and access to services	46

Sources: ESI ThoughtLab; our survey among 4,600 individuals conducted March 2020.

Table 2. Please rank the following city agencies in terms of which benefit most from a "smart city" initiative (%)

	First	Second	Third	Fourth	Fifth	Sixth
Transportation (streets, parking, mass transit, etc.)	24	22	19	17	13	7
Electric utility	22	20	19	18	11	10
Public works (maintenance)	19	20	18	17	15	11
Water/Sewer utility	18	19	19	18	14	12
Law enforcement	14	13	15	18	19	21
City administration	15	13	14	14	19	25

Sources: Black & Veatch; our survey among 4,600 individuals conducted March 2020.

Table 3. Key actions needed to improve smart cities' living environment (%)

Improve balance of land use (commercial space, residential space and public space)	67
Encourage recycling and efficient energy use	77
Update or renovate ageing buildings and redeveloping underused land	67
Encourage construction of "green" buildings and development of green building standards	73
Build more green space/parks	77
Encourage use of electric vehicles and other carbon-neutral vehicles	84
Reduce the number of private cars and vehicles within city limits	74
Make the city more bicycle or pedestrian-friendly	75
Build more entertainment and cultural venues (sports, performing arts, museums, etc.)	64
Install more cameras/sensors to regulate traffic and improve public safety	78

Sources: KPMG; our survey among 4,600 individuals conducted March 2020.

Table 4. How smart cities can be catalysts for better health and wellness (%)

Remote patient monitoring	3.9
Lifestyle wearables	0.6
Telemedicine	1.1
Data-based health interventions: Maternal and child health	3.8
First aid alert applications	0.2
Infectious disease surveillance	3.7
Real-time air quality information	0.6
Data-based health interventions: Sanitation and hygiene	0.4
Emergency response optimization	0.4
Data-driven building inspections	0.3
Predictive policing	0.5
Real-time crime mapping	0.4
Gunshot detection	0.3
Congestion pricing	0.2
Demand-based microtransit	0.2
Water quality monitoring	0.4

Sources: McKinsey; our estimates.

Table 5. Where stakeholders want that the cities invest more (%)

	Citizens	**Businesses**
Providing data to make businesses/consumers more aware of energy use	62	56
Installing smart grids that use embedded sensors to manage waters, gas, and electric services	59	54
Installing environmental sensors to provide continuous monitoring of air quality, pollution, etc.	58	51
Improving coordination of power generation and power demand	58	47
Using predictive maintenance planning to focus on key environmental areas	56	45
Offering incentives for installing responsive devices and appliances	55	44
Focusing on distributed generation from renewable sources and micro-grids	53	42

Sources: ESI ThoughtLab; our survey among 4,600 individuals conducted March 2020.

Table 6. The return on investments in smart city pillars by maturity stage (%)

	Beginner	Transitioning	Leader
Environment	2.4	7.8	23.8
Mobility	4.8	7.6	18.4
Public health	0.6	6.8	12.6
Economy	0.4	5.6	6.8
Governance	7.8	11.8	6.6
Infrastructure	10.4	12.6	6.5
Payment systems	4.7	5.8	6.4
Public safety	4.5	5.9	6.3
Talent/Education	0.4	4.6	6.2
Budget/Financing	0.3	4.4	0.3

Sources: ESI ThoughtLab; our survey among 4,600 individuals conducted March 2020.

Table 7. How cities are planning to fund their smart city programs (%)

Philanthropic support	63
Public–private partnerships	67
Department budgets	58
Pay-for-success	57
Revenue share financing	54
As a service financing	56
Concession financing	55
Consumption-based financing	54
State support	39
User fees	35
Sales and leaseback	33
Franchise or shared revenue model	28
Federal support	30
Debt	28

Sources: ESI ThoughtLab; our survey among 4,600 individuals conducted March 2020.

Table 8. The components of a smart city which are most likely to reduce energy consumption (%)

Intelligent transport systems	12
Building efficiency/control systems	44
Smart grids (including smart meters)	31
Energy storage	13

Sources: Osborne Clarke; our survey among 4,600 individuals conducted March 2020.

Table 9. How smart city technologies can make daily commutes faster and less frustrating (%)

Commute time ***% decrease in average commute time by application***	
Real-time public transit information	4.3
Predictive maintenance of transit system	2.2
Intelligent traffic signals	5.1
Smart parking	2.4
Real-time road navigation	2.5
Demand-based microtransit	2.9
Bike sharing	0.5
Congestion pricing	1.4
Digital payment in public transit	2.4
Smart parcel lockers	0.6
Parcel load pooling	0.5
Integrated multimodal information	0.5
Car sharing	-0.3
E-hailing (private and pooled)	-1.3
Time spent interacting with government and healthcare system ***% reduction in time spent by application***	
Digital administrative citizen services	40
Telemedicine	8
Online care search and scheduling	5
Integrated patient flow management systems	4

Sources: McKinsey; our estimates.

Table 10. Citizens' feeling about the need for investment in energy technologies (%)

Focusing on distributed generation from renewable sources and micro-grids	66
Improving coordination of power generation and power demand	61
Installing smart grids that use embedded sensors to manage water, gas, and electric services	72
Providing data to help make businesses and consumers more aware of their energy use	69

Sources: ESI ThoughtLab; our survey among 4,600 individuals conducted March 2020.

6. Conclusions

Organized, systematized, and responsive layers of monitored technological systems exemplarily configure smart cities, as awareness and responsiveness are implemented by use of the surveillance of urban undertakings, business relations, and mobilities in data-driven environments. Harnessing efficiently computational capacity, tracking devices, and geolocative wearable technologies lead to the converting of urban behaviors into measurable quantitative data. Using digital media infrastructures, smart city administration patterns depend on the assessment and conceptualization of urban undertakings as advanced data streams. The assimilation of digital infrastructure, integrated technologies, and predictive analytics used to drive urban administration is associated with high-speed networks and ubiquitous connectivity (Halegoua, 2020).

References

[1] Ainsworth-Rowen, E. (2019). Networked, smart, and responsive devices in sustainable Internet-of-Things-based manufacturing systems: Industrial value creation, cognitive decision-making algorithms, and operational performance improvement. *Economics, Management, and Financial Markets*, 14(3), pp. 9-15.

[2] Bargh, M. (2019). Digital health software and sensors: Internet of Things-based healthcare services, wearable medical devices, and real-time data analytics. *American Journal of Medical Research*, 6(2), pp. 61-66.

[3] Black & Veatch (2020). Smart cities. https://www.bv.com/solutions/smart-cities.

[4] Clark, J. (2020). *Uneven innovation: The work of smart cities*. New York, NY: Columbia University Press.

[5] Cosgrave, K. W. (2019). The smart cyber-physical systems of sustainable Industry 4.0: Innovation-driven manufacturing technologies, creative cognitive computing, and advanced robotics. *Journal of Self-Governance and Management Economics*, 7(3), pp. 7-13.

[6] Dolan-Canning, R. (2019). Sensor-based and cognitive assistance systems in Industry 4.0: Big data analytics, smart production, and sustainable value creation. *Economics, Management, and Financial Markets*, 14(3), pp. 16-22.

[7] Drennan-Stevenson, K. (2019). Real-world implementation of cyber-physical production systems in smart manufacturing: Cognitive automation, industrial processes assisted by data analytics, and sustainable value creation networks. *Journal of Self-Governance and Management Economics*, 7(3), pp. 14-20.

[8] Dubman, R. (2019). The digital governance of data-driven smart cities: Sustainable urban development, big data management, and the cognitive Internet of Things. *Geopolitics, History, and International Relations*, 11(2), pp. 34-40.

[9] ESI ThoughtLab (2020). Smarter cities 2025. https://econsultsolutions.com/esi-thoughtlab/smarter-cities-2025/.

[10] Eskridge, M. (2019). Privacy and security data governance: Surveillance mechanisms and resilience risks of smart city technologies. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 63-69.

[11] Felstead, M. (2019). Cyber-physical production systems in Industry 4.0: Smart factory performance, manufacturing process innovation, and sustainable supply chain networks. *Economics, Management, and Financial Markets*, 14(4), pp. 37-43.

[12] Fincham, S. (2019). Internet of Things-based medical applications, wearable sensor systems, and real-time health monitoring. *American Journal of Medical Research*, 6(2), pp. 49-54.

[13] Flygare, A. (2019). Gaining social attraction and disrupting gender dynamics through mobile dating applications: Online romance, impression management, and sexual behaviors. *Journal of Research in Gender Studies*, 9(1), pp. 167-173.

[14] Goethals, I. (2019). Real-time and remote health monitoring Internet of Things-based systems: Digital therapeutics, wearable and implantable medical devices, and body sensor networks. *American Journal of Medical Research*, 6(2), pp. 43-48.

[15] Groener, M. (2019). Automated robotic and network connectivity systems for self-driving vehicle technology. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 36-42.

[16] Gutberlet, T. (2019). Data-driven smart sustainable cities: Highly networked urban environments and automated algorithmic decision-making processes. *Geopolitics, History, and International Relations*, 11(2), pp. 55-61.

[17] Gutschow, E. (2019). Big data-driven smart cities: Computationally networked urbanism, real-time decision-making, and the cognitive Internet of Things. *Geopolitics, History, and International Relations*, 11(2), pp. 48-54.

[18] Halegoua, G. R. (2020). *Smart cities*. Cambridge, MA: The MIT Press.

[19] Heuston, D. (2019). Medical big data processing mechanisms and real-time patient health monitoring. *American Journal of Medical Research*, 6(2), pp. 55-60.

[20] Kitchin, R., Coletta, C., Evans, L., & Heaphy, L. (2019). Creating smart cities. In C. Coletta, L. Evans, L. Heaphy, and R. Kitchin (Eds.), *Creating smart cities*, pp. 1-18, New York, NY: Routledge.

[21] Kovacova, M., Kliestikova, J., Grupac, M., Grecu, I., & Grecu, G. (2019). Automating gender roles at work: How digital disruption and artificial intelligence alter industry structures and sex-based divisions of labor. *Journal of Research in Gender Studies*, 9(1), pp. 153-159.

[22] KPMG (2020). Driving the smart city development. https://home.kpmg/xx/en/home/insights/2020/05/driving-the-smart-city-development.html.

[23] Kral, P., Janoskova, K., Podhorska, I., Pera, A., & Neguriță, O. (2019). The automatability of male and female jobs: Technological unemployment, skill shift, and precarious work. *Journal of Research in Gender Studies*, 9(1), pp. 146-152.

[24] Ludbrook, F., Frajtova Michalikova, K., Musova, Z., & Suler, P. (2019). Business models for sustainable innovation in Industry 4.0: Smart manufacturing processes, digitalization of production systems, and data-driven decision making. *Journal of Self-Governance and Management Economics*, 7(3), pp. 21-26.

[25] McKinsey (2019). Future of cities. https://www.mckinsey.com/featured-insights/future-of-cities.

[26] Meyers, T. D., Vagner, L., Janoskova, K., Grecu, I., & Grecu, G. (2019). Big data-driven algorithmic decision-making in selecting and managing employees: Advanced predictive analytics, workforce metrics, and digital innovations for enhancing

organizational human capital. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 49-54.

[27] Mircică, N. (2019). The design, implementation, and operation of self-driving cars: Ethical, security, safety, and privacy issues. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 43-48.

[28] Nica, E. (2019). Cyber-physical production networks and advanced digitalization in Industry 4.0 manufacturing systems: Sustainable supply chain management, organizational resilience, and data-driven innovation. *Journal of Self-Governance and Management Economics*, 7(3), pp. 27-33.

[29] Nica, E., Miklencicova, R., & Kicova, E. (2019). Artificial intelligence-supported workplace decisions: Big data algorithmic analytics, sensory and tracking technologies, and metabolism monitors. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 31-36.

[30] Noack, B. (2019). Big data analytics in human resource management: Automated decision-making processes, predictive hiring algorithms, and cutting-edge workplace surveillance technologies. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 37-42.

[31] Olsen, M. (2019). Using data analytics in the management of employees: Digital means of tracking, monitoring, and surveilling worker activities. *Psychosociological Issues in Human Resource Management*, 7(2), pp. 43-48.

[32] Osborne Clarke (2020). Smart cities. https://www.osborneclarke.com/campaign/smart-cities/.

[33] Plumpton, D. (2019). Cyber-physical systems, Internet of Things, and big data in Industry 4.0: Digital manufacturing technologies, business process optimization, and sustainable organizational performance. *Economics, Management, and Financial Markets*, 14(3), pp. 23-29.

[34] Wilson, L. (2019). The gendered nature of employment and insecure employment in Northern Ireland: A story of continuity and change. *Journal of Research in Gender Studies*, 9(1), pp. 38-70.

[35] Zhuravleva, N. A., Cadge, K., Poliak, M., & Podhorska, I. (2019a). Data privacy and security vulnerabilities of smart and sustainable urban space monitoring systems. *Contemporary Readings in Law and Social Justice*, 11(2), pp. 56-62.

[36] Zhuravleva, N. A., Nica, E., & Durana, P. (2019b). Sustainable smart cities: Networked digital technologies, cognitive big data analytics, and information technology-driven economy. *Geopolitics, History, and International Relations*, 11(2), pp. 41-47.

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An Exploratory Analysis of the Consumer Resistance Determinants Regarding the Usage of Nanotechnology in Fashion Industry

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Abstract

Nanotechnology and nanoscience have brought attention to the area of experimental innovation and scientific research. This domain also includes nanomaterials which refer to a broad spectrum of physical, chemical, and biological methods which remodelled the fashion industry. The expectations of actual buyers, regarding the clothes that they purchase, improved significantly and they are in a continuous search of items that meet, at the same time, the protection function and that are sustainable for the environment. Nevertheless, in the fashion industry, we remark the resistance of the consumer when it comes to those type of innovations.

The present research aims to investigate the relationship existing among consumer innovation resistance when it comes to the use of nano materials in the fashion industry and the distinct factors of innovation and consumers' characteristics. The present research develops and empirically validates a scale that measures consumer's resistance determinants when it comes to the use of nanomaterials in the fashion industry through exploratory analysis. Confirmatory factor analysis was performed to check the constructs for testing the hypothesized factors and then, a Structural Equation Modelling was designed. Two out of four hypotheses have been supported by the collected data. Perceived risk and relative advantage are recognised as important factors that manage the consumer's resistance to the use of nanomaterials in the fashion industry. The contribution of the actual paper shows that there are very few studies that investigate the potential factors which affect consumer resistance to innovation when it comes to nanomaterials.

Keywords: Consumer Resistance, Innovation, Nanomaterials, Fashion Industry, Exploratory Analysis.

JEL Classification: C38; D01; D12; L67; O31.

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1. Introduction

We are living very difficult times that impose essential changes in our perspective, in our behaviour, in our social, environmental, financial and physical dimensions, so that we can preserve the environment where we live in accordance with the societal, economical and natural laws.

In this respect, there is a necessity at a global and local level to identify new methods of organizing the industrial activity. This aspect connects to the fashion industry, where clothes should be created by combining interdisciplinary techniques and revolutionary materials in order to provide customers innovations that could combine the requirements of a promiscuous audience.

In this way, nanotechnologies and nanoscience were developed, which present superior physical and chemical characteristics as compared to that of usual techniques of producing clothes.

Despite all the benefits that those methods present a resistance of the consumer when it comes to the adoption of those alternatives was remarked. What the present research proposes is to test and to identify potential determinants that cause this type of reaction from the consumers.

In the following a brief review of the existing studies on consumer resistance, followed by exploratory factor analysis and a structural equation model to test the proposed hypotheses were exposed. Discussions and limitations of the research were exposed.

2. Problem Statement

2.1 General Context

The manufacturing process in the fashion industry was revolutionized by the emergences of biomaterials and nanotechnologies that supported the production of composite materials. In this way, the fashion industry was remodelled, without disturbing the aesthetic and functional characteristics, but also considering the environmental dimension.

In our days, nanoscience and nanotechnologies procedures play an essential function in the process of designing and sharing more sustainable and eco-friendly clothes for approaching generations.

Nanoscience and nanotechnology encompass the analysis and functionality of nanoparticles used in the process of producing clothes; particles developed by chemical, biological, engineering, and scientific procedures.

Even if those procedures provide lots of benefits for the consumers, many constraints prevent those products from being accepted as innovations. Among the various reasons that urge consumers to reject nano textiles (clothes made by using nanomaterials or nano procedures) identifies the inherent tendency of the consumers to go for the default option and to reject something novel, because of the limited knowledge, financial constraints, risk aversion, status-quo bias, etc. All these types

of latent variables determine the consumer to manifest something acknowledged, in general terms, as the resistance to innovations.

Therefore, what proposes the present articles is to identify some of the specific factors that determine consumer resistance to the acceptance of the utilization of nanomaterials in the fashion industry.

The existing specialized literature identifies three types of innovations: incremental, radical, and disruptive ones (Schumpeter, 1934). The present study deals with radical innovations. Nanotechnology is expected to transform the existing fashion market, because of its capacity to provide a competitive advantage, being characterized by essential sources of technological, social, and economic changes for the actual society.

The consumer acceptance of radical innovations requires more commitment and encompass psychological efforts, time, risks, and financial costs higher as compared to incremental innovations (Heiskanen et al., 2007). Resistance to change comes as a natural response of the consumers because it is the individual inclination to attempt for consistency and to satisfy the status-quo (Puiu, I. A., 2019; Ram and Sheth, 1989).

The existing literature achieved a distinction between functional and psychological factors that affect consumer resistance behaviour (Antioco and Kleijnen, 2010). Psychological determinants refer to how consumers perceive the innovativeness of nanotechnologies used in the fashion industry. The essential factors that have been recognized by the specialized literature as relevant in the analysis of the consumer behaviour to innovations were attitudes, values, motives, reasons, and consumer's previous exposure to that innovation (Ram, 1987). On the other hand, functional determinants are related to the effect of the innovations on the consumer, that generates resistance behaviour.

According to Ram (1987), functional factors splits into two sections: consumer subordinate context and consumer independent context. The consumer independent context is supposed to create the same type of resistance across all consumers, while the consumer dependent context varies across distinct consumers. Innovation consumer dependent factors affect consumer's decision to adopt novel products, factors like relative advantage, risk, motivation, and expectations for better articles. In what follows, each one of these factors will be detailed and, also, the tested hypotheses stated.

2.2 Factors of Influence

The relative advantage of an innovation, in this case, nanotechnology applied in the process of producing clothes designates the benefits that innovation provides in order to be considered better than an already exiting alternative. The relative advantage could assume multiple applications, from economic and financial gains, health, and social benefits, time saved and perceived utility.

The perceived risk represents an additional dimension in the analysis of innovation resistance behaviour. Distinct types of risk exist, namely, financial, physical, time, social, psychological and performance risks (Cherry and Fraedrich,

2002). Also, expectations for better products variable were used to estimate the inhibitory effect on the adoption of innovations, namely nanotechnologies used in the fashion industry.

Lastly, motivations were the determinants that settle consumer's needs. Motivation comprises inner processes that lead to behaviour adoption.

To identify the existing relationship between consumer's resistance to nanotechnologies used in the fashion industry and the above-discussed dimensions, we asserted four hypotheses based on the innovation resistance models and previous research findings.

3. Aims of the research

In the present research, we considered the relative advantage of clothes made of nanomaterials as the advantage over usual clothes. Based on past research (Hosseini et al., 2016) it is expected that the relative advantage will exhibit a negative influence of consumer resistance to nanotechnologies applied in the fashion industry.

Hypothesis 1: A low level of relative advantage leads to a higher level of consumer resistance to nanotechnologies in the fashion industry.

Regarding the risk dimension the financial, security and physical risks were considered as essential drivers in case of nanotechnologies used in clothing production.

Hypothesis 2: A high level of perceived risk is expected to lead to a high level of consumer resistance to nanotechnologies in the fashion industry.

Based on previous studies (Hosseini et al., 2016) "expectations" variable is supposed to manifest a positive effect on consumer resistance to clothes made using nanotechnologies.

Hypothesis 3: The higher the expectations for clothes made of nanomaterials, the higher the consumer resistance.

Lastly, motivation is expected to manifest a negative effect on the resistance behaviour to nanotechnologies in the fashion industry.

Hypothesis 4: A low level of motivation leads to a high level of resistance to nanotechnologies in the fashion industry.

4. Research Methods

The data for the present study was collected using online platforms. The initial questionnaire comprised 33 items, but because some of the items were not statistically significant, they were omitted from the analysis, only 24 items remaining. The scale contains statements related to clothes made by using nanomaterials. Each variable was measured on a ninth-point Likert scale with anchors of one to indicate "strongly disagree" and ninth to indicate "strongly agree". With the collected data we intend to apply exploratory factor analysis and a structural equation model in order to explain the consumer resistance to innovation behaviour when it comes to wearing clothes made using nanomaterials. The entire analysis

process will be achieved using the R statistical and programming software (R Core Team, 2018).

Table 1. Demographic information's

Item	Classification	No = 185	
		No.	Percentage
Gender	Male	32	17.30%
	Female	153	82.70%
Age	18-25 years old	136	73.51%
	26-35 years old	31	16.80%
	36-45 years old	11	6.00%
	Over 45 years old	7	3.69%
Residence	Urban	139	75.14%
	Rural	46	24.86%
Employed	Yes	76	41.08%
	No	109	58.92%

Source: Author's Calculus

The participants in the study included 185 students from Biology and Chemistry Romanian Universities. Demographic information was listed in the previous table (Table 1). In the gathered sample, there is a preponderance of female respondents (82.70%), individuals aged between 18-25 years (73.51%) from the urban area (75.14%).

5. Findings

5.1 Exploratory Factor Analysis

The first step, in the exploratory factor analysis, intends to investigate the correlations among the items of the questionnaire.

From figure 1 (Figure 1), it could be recognized that most of the values correlate positively, except items I12 and I13 which correlate negatively with the rest of the items. The second step was to apply Bartlett's test of sphericity. Small values of the significance indicated that exploratory factor analysis is applicable to our data.

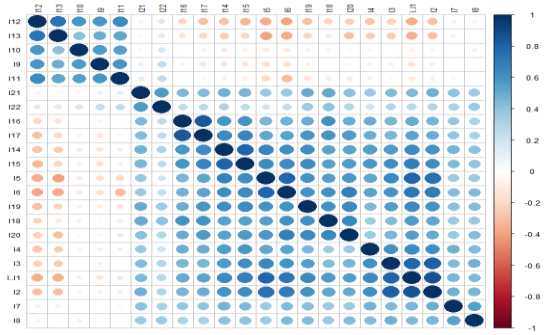

Figure 1. Correlations among Items
Source: Author's Calculus

In the next step, it was applied the Kaiser-Meyer-Olkin-Statistics (KMO) to estimate the appropriateness of the sample to run this type of analysis. The KMO Statistics registered a score of 0.91, considered a marvellous score (Kaiser, 1974).

To determine the suitable number of factors, we used the parallel analysis, performing the fa.parallel function, from the psych (Revelle, 2019) package. From the graphical representation (Figure 2), we could witness a red and a blue line. The red line shows simulated and resembled data, while the blue one show eigenvalues of actual data. The point of inflexion is the position where the gap among simulated and resembled data tends to be at a minimum. In this analysis, five factors were recommended.

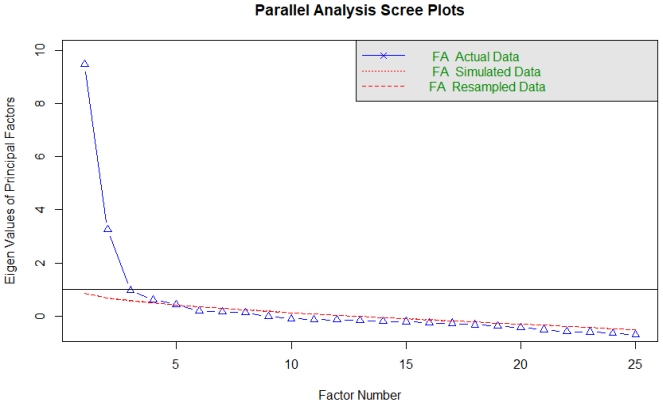

Figure 2. Scree Plot
Source: Author's Calculus

The factoring method used was weighted least squares (WLS), while the factor rotation was oblimin, recommended in the circumstances when the factors are presumed to be correlated. Each of the obtained factors was named depending on the items that it comprises in the following way: relative advantage, consumer resistance, perceived risk, the expectation for better products and motivation.

Table 2. Factors, Items and Loadings

FACTORS	ITEMS	FACTOR LOADING
Relative Advantage (F1)	1. Clothes made of nanomaterials fit with my needs.	**0.822**
	2. Clothes made of nanomaterials fit with my lifestyle/workstyle.	**0.895**
	3. Clothes made of nanomaterials fits with my habits of using clothes.	**0.878**
	4. Clothes made of nanomaterials are a good complement to the traditional clothes.	**0.642**
	5. I need clothes made of nanomaterials for their new features/functions.	**0.601**
	6. I have intentions to use clothes made of nanomaterials soon.	0.456
	7. Clothes made of nanomaterials are more fashionable, stylish, and trendy.	0.405
	8.The price/quality relationship is acceptable in clothes made of nanomaterials.	0.408
Consumer Resistance (F2)	1. Buying clothes made of nanomaterials may be a wastage of money.	**0.619**
	2. I fear of certain changes that clothes made of nanomaterials may impose on me.	0.587
	3. It is unlikely that I buy clothes made of nanomaterials soon.	**0.678**
	4. Clothes with nanomaterials are not for me.	**0.864**
	5. I do not need clothes with nanomaterials.	**0.716**
Perceived Risk (F3)	1. I will wait to buy clothes made of nanomaterials till it proves beneficial for me.	**0.702**
	2. I need to clarify some queries and justify the reasons to buy clothes made of nanomaterials.	**0.671**
	3. I am waiting for the right time to buy clothes made of nanomaterials.	**0.849**
Expectation for Better Products (F4)	1. I expect more secure clothes made of nanomaterials.	**0.760**
	2. I expect more durable clothes made of nanomaterials.	**0.768**
	3. Clothes made of nanomaterials are more convenient, reliable, and useful than normal clothes.	0.401
	4. Clothes made of nanomaterials have a good integration of wide range of functions and services.	0.422
Motivation (F5)	1. I expect more convenient and advanced clothes made of nanomaterials.	**0.656**
	2. It is exciting and entertaining to use clothes made of nanomaterials	0.485
	3. Using clothes made of nanomaterials would be beneficial to environment.	**0.626**
	4. Understanding and using clothes made of nanomaterials may require more skills and or mental effort.	0.452

Source: Author's calculus

As could be observed from the previous table (Table 2), the first factor catches most of the information, being higher than the rest. For all items, the registered loadings that capture the assumed effect of a latent variable and an observed indicator, or broadly speaking, the correlation among them, record scores higher than 0.3.

In terms of adequacy tests, the root mean squared of residuals is desirable to register a value closer to zero, in this case, being 0.03, while the root mean of squared error of approximation registers a score of 0.077, lower than the 0.80 threshold. Regarding the Tucker-Lewis Index of Factoring Reliability, the registered score was 0.894, below the 0.95 cut-off.

For all the obtained dimensions, the Cronbach's Alpha was applied, a measure of internal consistency, which shows how much related are the items of a dimension. In e case of relative advantage, a Cronbach alpha score of 0.92 is registered. The consumer resistance dimension registers a score of 0.87 while the perceived risk dimension has a level of 0.86. The expectation for better product has an alpha score of 0.90 and the motivation dimension registers a Cronbach alpha score of 0.80.

5.2 Confirmatory Factor Analysis

In case of the confirmatory factor analysis, in terms of fit indices, the output revealed slightly good scores for a good fit. The goodness of fit index (GFI) recognised as being like an R2 (Kline, 2016) registers a score of 0.927, below the 0.95 threshold. The adjusted goodness of fit (AGFI) registers a score of 0.91, above the 0.90 threshold (Table 3).

The normed fit index (NFI) analyses the discrepancy among the chi-square value of the null model and the chi-squared value of the hypothesized model (Bentler and Bonett, 1980), a value greater than 0.95 being desirable. In the present analysis it records a value of 0.799 (Table 3). The Tucker-Lewis Index measures the goodness of fit considering the size of correlations in data and the number of parameters in the model. This one registers a value of 0.837 (Table 3).

The comparative fit index (CFI) registers a value of 0.857. The root mean square error of approximation (RMSEA) registers a value of 0.102, a score lower than 0.80 being desirable, while the standardized root mean square residuals (SRMR) registers a value of 0.085 (Table 3.).

Table 3. Fit Indices for Confirmatory Factor Analysis (CFA)

MEASURE	NAME	VALUE	CUT-OFF
A(GFI)	(Adjusted) Goodness of Fit	AGFI = 0.902 GFI = 0.927	AGFI I ≥0.90 GFI I ≥0.95
N (NFI) TLI	(Non) Normed Fit Index Tucker-Lewis Index	NNFI (TLI) = 0.837 NFI = 0.799	NNFI ≥ 0.95 NFI ≥ 0.95
CFI	Comparative Fit Index	CFI = 0.857	CFI ≥ 0.90
RMSEA	Root Mean Square Error of Approximation	RMSEA = 0.102	RMSEA < 0.08
SRMR	(Standardized) Square Root Mean Residual	SRMR = 0.085	SRMR < 0.08

Source: Author's calculus

5.3 Structural Equation Modelling

The main aim of the actual research was to determine the existing relationship among consumer resistance to nanotechnologies in fashion industry and different determinants. In the present case, it is desirable to identify the influence of relative advantage of clothes made using nanomaterials, perceived risk behaviour, expectations for better products and motivation when it comes to the usage of clothes realised with nanomaterials.

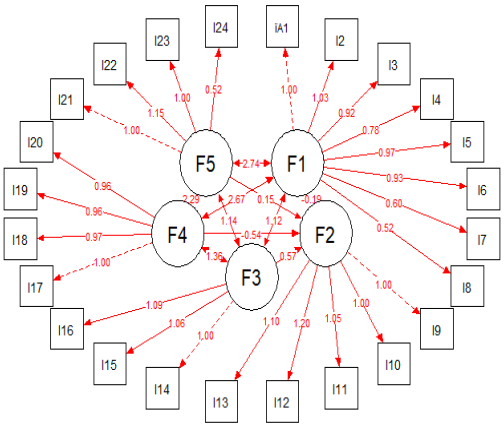

Figure 3. Graphical Format Structural Equation Model
Source: Author's calculus

The performed model revealed that the relative advantage manifests a negative influence on consumer resistance behaviour, and that the influence is not statistically significant (**H_1**: -0.253; p-value = 0.080). Perceived risk exhibits a statistically significant positive influence (**H_2**: 0.668; p-value ~ 0.000), while expectations dimension manifests a negatively statistically significant influence (**H_3**: -0.727; p-value = 0.007). Motivation dimension manifests a positive influence, but the result is not statistically significant (**H_4**: 0.278; p-value = 0.282). The gathered results were listed in the following table (Table 4).

Table 4. Regression Coefficients

Regressions	Estimate	Std. Error	Z-Value	P-Value	Std.lv	Std.all
Consumer Resistance (F2) ~						
Relative Advantage (F1)	**-0.253**	0.144	-1.752	**0.080**	-0.254	-0.254
Perceived Risk (F3)	**0.668**	0.122	5.489	**0.000**	0.537	0.537
Expectation for Better Products (F4)	-0.727	0.271	-2.680	0.007	-0.548	-0.548
Motivation (F5)	0.278	0.258	1.077	0.282	0.221	0.221

Source: Author's calculus

6. Conclusions

The above table (Table 4) showed that only two hypotheses of four were supported (H1: Relative Advantage and H2: Perceived Risk). The acceptance of the relative advantage hypothesis was expected, as scientific literature showed that the relative advantage manifests a negative influence on consumer resistance to innovations (Ram, 1987; Ram & Sheth, 1989).

Therefore, respondents who perceived clothes made of nanotechnologies and nanoscience more favourable than usual clothes, created using standard procedures, manifest a low level of resistance when they are exposed to those innovations.

Similarly, the influence of the perceived risk dimension on the consumer resistance is a negative one. In other words, consumers that perceive clothes made of nanomaterials more risky than usual clothes manifest a high level of resistance. However, the influence does not prove to be statistically significant.

The collected data for the present research do not confirm the hypothesis of H3: Expectations and H4: Motivations. In case of the expectations dimension, a positive influence would be expected, but it proves to be a negative influence, which showed to be statistically significant.

In case of the motivation dimension, it is expected that people with a high level of motivation shall manifest a low level of resistance to nanomaterials. However, the obtained result was not statistically significant, leading to the rejection of the hypothesis.

During this research, we found that consumer resistance when it comes to wearing clothes made of nanomaterials is caused mostly by the relative advantage and the perceived risks. However, other factors should be tested to quantify their influence on resistance behaviour.

As a limit of the present research the convenience sample based on which the study was carried out should be considered, therefore we should keep in mind this aspect when generalizing the results.

Nanotechnology already impacted in a significant way the fashion industry. Thus, a future analysis on consumer perceptions regarding nano textiles, their intentions and actual behaviour would be of interest.

References

[1] Antioco, M., & Kleijnen, M. (2010). Consumer adoption of technological innovations: Effects of psychological and functional barriers in a lack of content versus a presence of content situation. *European Journal of Marketing*, 44(11/12), 1700-24.

[2] Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88, pp. 588-606.

[3] Cherry, J., & Fraedrich, J. (2002). Perceived risk, moral philosophy, and marketing ethics: Mediating influences on sales managers ethical decision-making. *Journal of Business Research*, 55(2), pp. 951-962.

[4] Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39, pp. 31-36.

[5] Kline, R. B. (2016). *Principles and Practice of Structural Euation Modelling*. Fourth Edition. The Guilford Press: New York.

[6] Heiskanen, E., Hyvönen, K., Niva, M., Pantzar, M., Timonen, P., & Varjonen, J. (2007). User involvement in radical innovation: Are consumers conservative?. *European Journal of Innovation Management,* 10(2), pp. 489-509.

[7] Hosseini, M. H., Delaviz, M., Derakhshide, H., & Delaviz, M. (2016). Factors Affecting Consumer Resistance to Innovation in Mobile Phone Industry. *International Journal of Asian Social Science*, 6(9), pp. 497-509.

[8] Puiu, I. A. (2019). Consumer Resistance to Innovation in the Fashion Industry. *Studies in Business and Economics*, 14(2), pp. 127-140.

[9] R Core Team (2017). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. Retrieved from https://www.R-project.org/.

[10] Ram, S. (1987). A model of innovation resistance. *Advances in Consumer Research*, 14(4), pp. 208-213.

[11] Ram, S., & Sheth, N. J. (1989). Consumer Resistance to Innovations: The Marketing Problem and its Solutions. *Journal of Consumer Marketing*, 6(2), pp. 5-14.

[12] Revelle, W. (2019). *psych: Procedures for Personality and Psychological Research*. Northwestern University, Evanston, Illinois, USA. Retrieved from https://CRAN.R-project.org/package=psych.

[13] Schumpeter, J. (1934). *The Theory of Economic Development*. Harvard University Press, Cambridge, Massachusetts.

[14] Yves, R. (2012). lavaan: An R Package for Structural Equation Modelling. *Journal of Statistical Software*, 48(2), pp. 1-36. Retrieved from http://www.jstatsoft.org/v48/i02/.

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From Traditional to Digital: A Study on Business Models in The Context of Digitalization

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Abstract

Living digitalized times is a challenge not only for the individuals but also for businesses. As people tend to think that robots will slowly replace their activity, it's important to consider this mindset and implement measures to alleviate this mentality. In these times, being a laggard on new trends is very likely to affect business performance, taking into account also specific market competition. Organizations worldwide are gradually adapting their strategies based on different types of business models, adapted to their specific objectives and field of activity. The business model denotes a concept of organization and functioning which is aimed to assure the proper functioning of the organization, taking into account the numerous specific influence factors: environment, competition, technology, mission and vision.

The aim of this study is to identify the impact of technology and digitalization on business models and to analyse the strengths and weaknesses of the traditional manner of business model implementation in an organization as compared to the digital-focused approach. Moreover, observing the European trends on digital transformation of business, new approaches introduced by technology and strategies on digitalization would represent a point of interest for future studies on this subject.

For this purpose, taking into consideration other authors opinion on this, an outline of the existing literature on this subject will be performed.

Keywords: Business models, digital business, digital transformation, digital Europe, agile methodology.

JEL Classification: O3

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1. Introduction

Keeping up with the latest changes brought by digitization and technology is no longer a fad, but a necessity. Given that, for example, customers have unlimited internet connection and by a single touch they can identify hotels, restaurants, better prices for goods and services, the pressure on businesses to successfully compete on the market becomes increasingly challenging.

Over the last years, digitization introduced entirely new business models and implicitly new competition in otherwise very traditional sectors. According to Chakravorti et al. (2019), "digital businesses" are the ones that have a digital platform (e.g. e-commerce platforms, digital media, sharing economy platforms, online freelance) as core to its business model. Based on researches made by Wlömert and Papies (2016), Spotify tends to completely change the music industry, as well as Netflix and other live-streaming movie services are challenging the classic TV industry (Ansari et al., 2016). Similarly, Airbnb is strongly competing with the hotel industry by making almost any home a potential tourist accommodation while the expansion of Uber and other ride-sharing services leads to taxi-drivers protests around the world. Each of these companies have different approaches of business models: subscription business model, multi-sided marketplace model or platform-based model. In the existing literature, limited focus was put on the digitization of business models, but rather on their conceptualization, redesign or operationalization (Foss & Saebi, 2016). Considered by Verhoef et al. (2019), the digital transformation combines several branches of learning such as marketing, management approach, supply chain and information technology. Team leaders need to focus their attention on understanding how technology can increase the processes quality, efficacy and efficiency and how employees can be persuaded to become resources of digital implementation – by building a knowledge base. Leonardus and Sasmoko (2019) underline also the importance of the role of leaders in order to develop an innovative business model, in order to become digital leaders. A digital leader means combining the leadership style of a transformational leader with the embedding of digital technology (Leonardus & Sasmoko, 2019).

Therefore, the digital transformation has become an important factor for the business environment. The following chart (Figure 1) shows the progress of the EU Member States as regards the overall level of digitalization of the economy and society over the last 5 years. It is measured in terms of the progression of their Digital Economy and Society Index (DESI) score over that period of time.

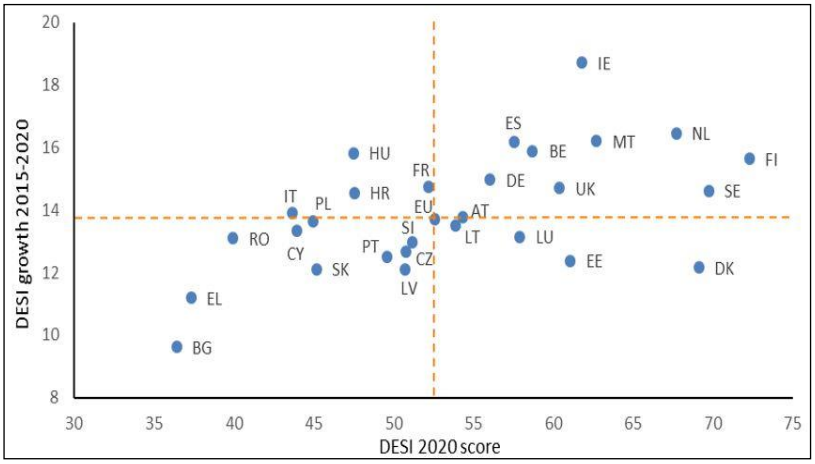

Figure 1. Digital Economy and Society Index – Member States' progress, 2015-2020
Source: Digital Economy and Society Index (DESI) 2020 Questions and Answers

The DESI is composed of five main policy areas, which group 37 indicators overall, as we can observe in Table 1:

Table 1. DESI policy areas

Policy area	Requirements
1. Connectivity	Fixed broadband take-up, fixed broadband coverage, mobile broadband and broadband prices
2. Human capital	Internet user skills and advanced skills
3. Use of internet	Citizens' use of internet services and online transactions
4. Integration of digital technology	Business digitization and e-commerce
5. Digital public services	e-Government

Source: Digital Economy and Society Index (DESI) 2020 Questions and Answers

Nowadays, organizations are strongly focused on the continuous improvement of internal relationships between departments, including with the IT department, the importance of which grew steadily over the last years, as evidenced by the increasing number of CTO (Chief Technology Officer) and CIO (Chief Information Officer) positions in large companies as well as by the increased focus on innovative IT solutions, as evidenced especially in Romania by the increased contribution of

IT companies to national GDP and the significant increase in overall compensation schemes for IT specialists.

Thus, as the IT department shifts from a more technical support role to a business process re-engineering and optimization function, companies also focus on improving the interaction between the technical development team and the process-oriented employees as a means to add business value, which will lead to a minimization of errors with the aid of technology.

Besides the environment the factors also change, and the business model has a crucial role on economic efficiency and effectiveness (Afuah & Tucci, 2001). In the existing literature, there are many types of business innovation models used by organizations, though they are not necessarily adapted to the latest digitalization context but are perfect suitable for digitalization, such as Sustainable Business Model Innovation (Young & Reeves, 2020) or Cambridge Business Model Innovation (Geissdoerfer et al., 2017). Of course, there is no general business model to be considered as the best version, given that it relies on the company's strategy, objectives and operating context (Pateli & Giaglis, 2003).

The process of digital transformation assumes the digitization of business models and new approaches on business processes, as compared to the digital technologies which are effectively introducing the artificial intelligence, IoT, 3D printing, cyber security, automation and so on. However, this process of digitization in an organization requires resources, and for this, a transparent communication between the leaders and the employees is mandatory, the main goal being that the strategy adopted has to be clear for everyone. According to Grab et al. (2019), self-managed teams could be used in order to foster digital transformation and digitization. In their research, Marquardt et al. (2018) identified that the most important obstacle in digitalization implementation is concerning human resource factors, in terms of IT skills of employees and specialist's availability. Nowadays, one project and task management methodology increasingly adopted by companies is Agile, taking into account that the external digitization context is rapidly evolving, so therefore the strategy of the company must be in line with the expectations faster, by a modern approach which will finally lead to benefits for all parts involved. Thus, adopting an agile mentality means to sum up the iterative part (not trying to get it all right from the beginning) and the incremental part (not building all at once). According to Ricci (n.d.), Agile digital transformation empowers companies to launch, learn, and re-launch digital initiatives, reacting properly to changing market context and customer needs. In order to adapt the organization's strategy to the agile scaling, the focus should be on transforming an agile team to an agile enterprise, by following the strategy through execution, as follows: shared vision, transparency and fast feedback, alignment and clear priorities, organizational learning and leadership development.

2. Problem Statement

As nowadays technology passed to the next step, meaning implementation, execution and improvement, every organization should take into consideration the

implementation of a digitalized business model (BM), which must be built on its own objectives and internal values. In the existing literature, there are several general opinions regarding a business model: in Timmers' research (1998), the business model has the role of explaining the logic of getting business done for an organization and as considered by Nilsson et al. (1999), the business model represents the relationship between information security systems, strategy and business processes. One of the main standards in the business model research area was introduced by Osterwalder & Pigneur (2010) who defined the business model as the key for an organization to create, deliver and capture value.

<table>
<tr><td rowspan="2">Key partners</td><td>Key activities</td><td rowspan="2">Value proposition</td><td>Customer relationship</td><td rowspan="2">Customer segments</td></tr>
<tr><td>Key ressources</td><td>Channels</td></tr>
<tr><td colspan="3">Cost stucture</td><td colspan="2">Revenue streams</td></tr>
</table>

Figure 2. Business model Canvas

Source: elaborated by the authors based on the research of Genzorova et al. (2019)

In Figure 3 we can observe the 9 parts composing the traditional business model Canvas, which are supposed to express the method for generating profit in an organization. Beside the fact that it explains in more detail the parts which are involved in this process, Canvanizer (2019) confirms that this business model is part of the entrepreneurship strategy, by creating, maintaining and keeping the most important values for the organization and the customer. Nevertheless, it is considered that the human resource still represents the central point of the implementation of digitization in a company, and the company should first think to digitalize the workplace in order to subsequently digitalize the process as well.

After a while, Ash Maurya (2012) adapted this model to the Lean Methodology, having as a central point the suitability of the product on the market, in order to support the entrepreneurial side of the business (Alami, 2016).

<table>
<tr><td rowspan="2">Problem</td><td>Solution</td><td>Unique value proposition</td><td>Unfair advantage</td><td rowspan="2">Customer segments</td></tr>
<tr><td>Key metrics</td><td></td><td>Channels</td></tr>
<tr><td colspan="3">Cost structure</td><td colspan="2">Revenue streams</td></tr>
</table>

Figure 3. Lean Canvas

Source: elaborated by the authors based on the research of Gierej (2017)

In Figure 3 we can observe the Lean Canvas proposal, which more adequately fits the needs of entrepreneurs: first identify the problem, then focus on a customer segment in order to validate preliminary hypotheses. Then, develop a unique value proposition adapted to the problem and begin to work on a solution. Ash Maurya

(2012) justified this concept as it seems that most entrepreneurial businesses fail because they don't check the clients' needs before anything else.

In terms of the public sector, the latest vision for the European Union is to focus on innovation and digital technologies as a means to achieve a better society as a whole, meaning improved health, better public services, more value-adding and better paid employment opportunities, etc. (according DigitalEurope, 2020). In order for this vision to be achieved, there are five key points which need to be improved in terms of the public sector institutions and as well by government and business leaders: framework for a European digital transformation of industry, open markets and fair global competition, crucial aspects of digital transformation, upscaling SMEs and upskilling the workforce and sustainability goals to drive industrial leadership. Regarding the framework, the main focus areas of the European Union should be as follows: health, manufacturing, connectivity and environment. For the open markets, the policies should have a relationship of reciprocity and should align digital standards and rules at global level. The crucial aspects to be improved would be: the research area, the artificial intelligence and the emerging technologies, 5G infrastructure, cyber-security in Europe and a European data economy. As the SMEs are considered as one of the main forces of the European economy, it is important for employees to participate in several research programs so that they can improve their skills and encourage collaboration between SMEs. Finally, sustainability should represent a key factor in the innovation project, by providing funds for developing technologies having as objective the decarbonization and the round economy (DigitalEurope, 2020).

3. Research Questions/Aims of the research

The aim of the study is to analyse the possibility of implementation of a digitalized business model in an organization and digitization's effects on existing traditional business models. As the digitization phenomena is very complex, business models must be adapted to the change, therefore an analysis based on the development of a digitalized version of business model can improve the quality of future researches on this topic.

4. Research Methods

Since this paper represents an outcome of an early PhD research, the methodology chosen was to examine other similar researches in the literature of the business models, new technologies that are influencing organizations' strategies and digital transformations in general. This will help us to obtain an overall view on the impact of technology on today's business market and on the process of digitization. By analysing the available literature, focus will be placed on the concept of Business Model Canvas by Osterwalder & Pigneur (2010) and the adjusted Lean Canvas Model by Ash Maurya (2012). Considering that both models are not fully adapted to the current digital-focused environment, we will try to identify the strengths and

weaknesses of both models and adjust them to better fit to a digitalized business model.

5. Findings

In order to have a better view on the impact of technology and digitization on business' strategies and on the challenges brought by innovation, 100 documents from the scientific literature were examined in order to respond to our research questions. Their interpretations and results will be presented below in a descriptive manner. The focus was set on identifying the strengths and weaknesses of traditional BM (Business model Canvas and Lean Canvas model) and then on some suggestions on digitization of business models. While Tapscott et al. (2000) were highly involved in describing the importance of development of a new business model based on a new structure, Linder and Cantrell (2000) developed a general framework but only based on a specific identification of factors. A few years later, in her study. Gierej (2017) managed to identify the main strengths and weaknesses of Business Model Canvas and Lean Canvas Model, as described and adapted in Table 2.

Table 2. Strength and weaknesses of BMC and LCM

BM type	Strengths	Weaknesses
BMC	- clarity - universality - the value proposition is the main point of the model	- lack of feedback mechanism - not adapted to the continuous changing solutions - lack of dynamism
LCM	- clarity - traditional logic 'problem-solution' used - flexibility and focus on human-client relationship	- the problem is the main point of the model - the innovations are too radical - creativity not encouraged

Source: adapted from Gierej (2017), p. 5

To support the existing business models in keeping up with the changes imposed by digitization, Saint-Joan (2018) considers that two other key points must be introduced besides the customer, the offer, the finance and the infrastructure: the data and the experience. Introducing the recoverable data in the centre of the business model allows having a business-relevant overview of customers' company-related experience as basis for organizational improvement. Finally, we should understand that the continuous improvement in an organization is very important and before trying to digitalize its business model, the impact of data and experience should be analysed on every existing dimension.

6. Conclusions

Implementing digitization in organizations may be really challenging, and this is why small steps should be taken in order to reach the final objective. Starting from small activities, followed by a good knowledge base and inclusion of employees may be a gradual step-by-step approach towards a successful result. There are many requirements (such as standardization, improved business models, financial investments in research, legal frameworks), risks and time associated with the implementation of innovation in an organization, but there are multiple benefits if it is properly performed, such as: smart services, real-time capability and modularity. We suggest that organizations should adapt to the current technology changes and exploit related opportunities by reorganizing their business model based on the initial objectives.

References

[1] Afuah, A., & Tucci, C. L. (2001). *Internet Business Models and Strategies*. New York: McGraw-Hill Companies, pp. 18-20.

[2] Alami, L. (2016). *Business Model Canvas / Lean Canvas, quelles différences?* [Business Model Canvas / Lean Canvas, what differences?]. Retrieved from: http://comment-innover.fr/2016/02/13/business-model/.

[3] Ansari, S., Garaud, R., & Kumaraswamy, A. (2016). The distruptor's dilemma: TiVo and the US television ecosystem. *Strategic Management Journal*, 37(9), pp. 1829-1853.

[4] Canvanizer*: Create a New Business Model Canvas* (2019). Retrieved from: https:// canvanizer.com/new/business-model-canvas.

[5] Chakravorti, B., Chaturvedi, R. S., & Filipovic, C. (2019). *Ease of Doing Digital Business 2019. Which Countries Help Expedite Entry, Growth, and Exit of Technology-Based Businesses?* [online]. Tufts: Tufts University. Retrieved from: https://www. doingbusiness.org/content/dam/doingBusiness/country/r/rwanda/RWA.pdf.

[6] DigitalEurope, *A Stronger Digital Industrial Europe*, Retrieved from: https://www. digitaleurope.org/wp/wp-content/uploads/2020/02/DigitalEurope-A-Stronger-Digital-Industrial-Europe.pdf /.

[7] European Commission (2020). Digital Economy and Society Index (DESI) 2020 *Questions and Answers*, Retrieved from: https://ec.europa.eu/commission/presscorner/ detail/en/qanda_20_1022.

[8] Foss, N. J., & Saebi, T. (2016). Fifteen Years of Research on Business Model Innovation: How far have we come, and where should we go? *Journal of Management*, 43(1), pp. 200-227.

[9] Geissdoerfer, M., Savaget, P., & Evans, S. (2017). The Cambridge Business Model Innovation Process. *Procedia Manufacturing*, 8, pp. 262-269.

[10] Genzorova, T., Corejova, T., & Stalmasekova, N. (2019). How digital transformation can influence business model, Case study for transport industry. *Transportation Research procedia*, 40, pp. 1053-1058.

[11] Gierej, S. (2017). The Framework of Business Model in the Context of Industrial Internet of Things, *Procedia Engineering*, 182, pp. 206-212.

[12] Grab, B., Olaru, M., & Gavril, R. M. (2019). Self-managed teams as a key to unlocking digital transformation in business management. *Quality-access to success*, 20(2), pp. 280-286.

[13] Leonardus, M., & Sasmoko, S. (2019). *Digital Transformation: Digital Leadership Role in Developing Business Model Innovation Mediated by Co-Creation Strategy for Telecommunication Incumbent Firms*, Retrieved from: https://www.intechopen.com/books/strategy-and-behaviors-in-the-digital-economy/digital-transformation-digital-leadership-role-in-developing-business-model-innovation-mediated-by-c.

[14] Linder, J. C., & Cantrell, S. (2000). Changing Business Models: Surveying the Landscape, *Institute for Strategic Change, Accenture*.

[15] Marquardt, K., Olaru, M., Golowko, N., & Kiehne, J. (2018). Study on Economic Trends, Drivers and Developments of the 21st Century. In: R. Pamfilie, V. Dinu, L. Tachiciu, D. Plesea & C. Vasiliu, (Eds.), *BASIQ The 4th international Conference on New Trends in Sustainable Business and Consumption*, pp. 65-73, Bucharest: ASE.

[16] Maurya, A. (2012). Running lean: iterate from plan A to a plan that works. *O'Reilly Media, Inc.*

[17] Nilsson, A. G., Tolis, C., & Nellborn, C. (1999). *Perspectives on Business Modelling – Understanding and Changing Organisations*, Berlin: Springer.

[18] Osterwalder, A. & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.

[19] Pateli A., & Giaglis G. (2003). A Framework for Understanding and Analysing eBusiness Models. *Proceedings of 16th Bled eCommerce Conference eTransformation*, pp. 329-348.

[20] Ricci, P. (n.d.). *The Five Principles of Agile Digital Transformation.* Retrieved from: https://www.cohnreznick.com/insights/five-principles-digital-transformation.

[21] Saint-Joan, D. (2018). Le DBMC (Digital Business Model Canvas) ©: *Comment définir les stratégies digitales et accompagner les entreprises dans leur transformation* [The DBMC (Digital Business Model Canvas) ©, How to define the digital strategies and accompany enterprises in their transformation], Retrieved from: www.linkedin.com/pulse/le-dbmc-digital-business-model-canvas-comment-d%C3%A9finir-saint-joan.

[22] Tapscott, D., Lowi, A., & Ticoll, D. (2000). *Digital Capital – Harnessing the Power of Business Webs*, Boston: Harvard Business School Press.

[23] Timmers, P. (1998). Business Models for Electronic Markets, *Journal on Electronic Markets*, 8(2), pp. 3-8.

[24] Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2019). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*. Retrieved from: https://doi.org/10.1016/j.jbusres.2019.09.022.

[25] Wlömert, N., & Papies, D. (2016). On-demand streaming services and music industry revenues – Insights from Spotify's market entry. *International Journal of Research in Marketing*, 33(2), pp. 314-327.

[26] Young, D., & Reeves, M. (2020). The Quest for Sustainable Business Model Innovation. Retrieved from: https://www.bcg.com/en-hu/publications/2020/quest-sustainable-business-model-innovation.

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Artificial Intelligence Adoption in Project Management: Main Drivers, Barriers and Estimated Impact

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Abstract

Artificial intelligence (AI) is reshaping the business world, being considered one of the most relevant disrupting factors in our days, due to its major impact on the workplace conditions. Several academic and practical studies were undertaken in order to identify the main drivers, barriers and impact adoption of AI technologies in business. But the adoption of AI in management, in general and, more specific, in project management (PM) processes is still not yet well covered by the actual research.

The paper aims to identify the characteristics of Artificial Intelligence adoption in project management, based on the theoretical frameworks related to the technology adoption. The authors also present findings of a global survey conducted by IPMA and PwC Romania during March-August 2020. By comparing the main findings of the global survey with the conclusions derived from the analysis of the theoretical frameworks, the authors discuss about the relevance of using the technology adoption frameworks in order to analyse the adoption of disruptive technologies.

Keywords: Artificial intelligence, Project Management, Adoption drivers, Adoption barriers, Adoption impact.

JEL Classification: O14, O33, O32, Q55, O31

1. Introduction

In the literature on technological change, Ricardo (1817) was one of the first economist acknowledging the importance of equipment and technological improvements, for the enhance of economic growth in the industrial sector. The technical improvement is perceived as part of the capital accumulation and not as an economic growth factor as such. It was Schumpeter (1942) who made an important contribution in the economic growth theory, by revealing the role of the

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technical progress as a growth factor. Schumpeter has linked the economic development with innovation, perceived as the development of equipment, new products, new production methods and new industrial organization.

After the mid of twenty centuries, the research on technological changes was more focused on the adoption and usage of new technologies. The technological innovation is perceived as an important factor for transforming the entire society, a factor which should be better understood, controlled and promoted. By considering the technical change as an exogenous factor for the economic activities, Solow (1956) and Swan (1956) established the foundation for the modern theory of economic growth.

The theory of innovation started to connect the markets' characteristics with the behaviour of firms (Scherer & Ross, 1990). Certain characteristics of the markets, such as concentration are important for stimulating the innovative behaviour of the firms.

Due to the continuous advancements of technologies and the intensification of the information flows on the global markets, knowledge began to be perceived as one of the main drivers of the economic growth, being considered as an important economic resource. Even though knowledge was always embodied in the economic activities, the digital technologies (Information and communications technologies-ICTs) expanded the economic presence of knowledge and has leaded to the acknowledgement of knowledge, as a productive factor. The extended usage of ICTs had changed the economy: new activities emerged, new behaviours of the economic actors, new competences required for the personnel. All these changes were integrated into the concept of New Economy. Related to the diversity of the changes in economy due to the technological innovations, Edquist and Riddell (2000) defined the following taxonomy: a) continuous (or small incremental) changes; b) discontinuous (or radical/disruptive) innovations and c) techno-economic paradigms changing. The concept of disruptive technologies is highlighting the impact more than the novelty of the technologies. The disruptive technologies are those which have a significant impact on the economic activity of firms.

Artificial Intelligence (AI) technologies are considered as being one of the most relevant disrupting technologies. The adoption of AI technologies leads to significant changes in the business rules, organizational culture and organizational performance. Considering that the AI technologies adoption in management, more specific, in project management is still not yet well researched, the authors of the paper contributed to a global study (survey), conducted by IPMA and PwC Romania during March-August 2020, and having as main objectives the identification of the perceived status of AI adoption in project management (PM).

The structure of the paper is as follows: After introduction, the next section of the paper presents some of the relevant theories, frameworks and models of technological adoption. In section 3, the research methodology of the global survey AI adoption in PM is presented. Section 4 presents the main findings of the global survey and section 5 includes a discussion about the global survey findings, mainly

in connection with the technological adoption frameworks. Authors also discuss about the utility of the technological adoption frameworks in researching the disruptive technologies.

2. Technology Adoption Theories, Frameworks and Models

Considering the importance of technological changes for economic growth, researchers defined theories, frameworks and models of the technology adoption, in organizations and at individual/user level. Table 1 is presenting some of the most known technology adoption theories.

Table 1. Relevant theories for the technology adoption

Theory	Technology adoption mechanism	References
Diffusion of innovation (DOI)) Theory	Diffusion process with multiple stages: understand innovation, intention to innovate, decision to innovate, implementation and usage. Main factors: innovation characteristics (relative advantage, compatibility with existing infrastructure, complexity, possibility to observe and try it), communication, time and social environment.	(Rogers, 1962)
Theory of the firms' Behaviour	Adoption behaviour factors: limited rationality; the problematic and slack search; the operating procedures, coalitions;	(Cyert & March, 1963)
Evolutionary economic theory	Technological changes on a longitudinal perspective (evolution of the technologies with incremental changes/ breakthroughs Stochastic adoption behaviour	(Nelson & Winter, 1982)
Theory of the creative destruction	The firm survival goal explains the innovation adoption behaviour.	Schumpeter (1942)
Network externalities theory	Adoption of innovation has network effects	(Farrell & Saloner, 1985)
Theory of Reasoned Action (TRA)	It explains and predict the social behaviour in relation with the technology adoption.	(Fishbein. & Ajzen, 1975)
(Decomposed) Theory of Planned Behaviour (TPB)	Three factors determine the adoption intention: attitude, subjective norms and the perceived control behaviour. Decomposed TPB	(Taylor & Todd, 1995)

Source: Authors' own contribution

The adoption frameworks and models (table 2) are defined as to understand why and how the organizations are innovating, by adopting new technologies and products. There are many general factors explaining the technology adoption, such as: technology availability, technology readiness, difficulty in adopting/implementing the technology, the importance/ relevance and urgency of the requirements/needs possible to be fulfilled by applying the technology.

Table 2. Frameworks and models for the technology adoption

Frameworks and models	Description	References
Technology–Organization–Environment (TOE) framework	Main factors of the adoption ability: organizational learning (knowledge barriers knowledge diversity, etc.), other environmental, organizational and technology characteristics, such us: market competitiveness, firm size, financial soundness, technology complexity.	(Tornatzky, Fleischer & Chakrabarti, 1990)
Iacovou, Benbasat and Dexter's framework	Adoption decision depends on the external pressure (market position, network externalities etc.), the organizational readiness (resource availability, integration with existing technologies, operational support etc.) and perceived benefits (impact on the productivity, level of costs, etc.).	(Iacovou, Benbasat & Dexter, 1995)
S-curve diffusion models	The function's parameters: the availability of technology (the origin), the acceptance rate (the slope) and the usage level (the ceiling).	(Griliches, 1957)
Imitation (or epidemic) models	Technology adoption is modelled through a stochastic variable, defined based on the number of firms already using the technology, the investment size, expected profit.	(Mansfield, 1961)
Absorptive capacity model	The model connects the firms' ability to acknowledge and assimilate the value of technology-related information with firm's capacity to use this information in decision making.	(Cohen & Levinthal, 1990)
Dynamic capabilities model	It relates firms' capabilities and resources to competitive advantage, in relation to the technology adoption.	(Teece, Pisano & Shuen, 1997)
Task-Technology fit (TTF) model	A good fit between task and technology increases the technology level usage and its performance impact (better efficiency, effectiveness, and/or quality).	(Goodhue & Thompson, 1995)
Technology Acceptance Model (TAM)	TAM uses two factors (usefulness and ease of use) in order to explain the computer usage intention and behaviour.	(Davis, 1986)
Extensions of TAM (ETAM)	TAM2 includes two new factors: the social influence construct (including the subject norms, image and voluntariness), and the cognitive construct (including the job relevance, the result demonstrability and the output quality). TAM3 includes four additional factors: individual differences, social influences, system characteristics and the facilitating conditions.	(Venkatesh & Bala, 2008) (Venkatesh & Davis, 2000)
Unified Theory of Acceptance and Use of Technology (UTAUT)	It includes additional predictors for the acceptance intention: the effort and performance expectancy, social influence and facilitating conditions. Other four variables were identified as moderating the relationships between different variables of the model: gender, experience, age and voluntariness of use.	(Venkatesh & Morris, 2000)

Source: Authors' own contribution

In case of Information and Communication Technologies (ICTs), most of the models are centred on individuals who are taking decisions about the usage of different ICT systems and tools. Depending on the level at which the decisions about the tools to be used are usually taken, different theories, frameworks and models from those presented in tables 1 and 2 are more adequate in order to study the ITCs adoption process.

3. Global Survey AI in PM

The authors were involved in a global survey conducted by IPMA and PwC Romania during March-August 2020, having as main objective the identification of the perceived status of AI adoption in project management, the evolution of AI adoption in different project management activities, the main factors influencing directly and indirectly (as mediating factors) the AI adoption decisions in PM, the main barriers in the AI adoption in PM, and the main AI methods and tools applied in PM. The target groups of the global survey were project management professionals (project managers and project team members), executive and functional managers of companies, mainly those implementing projects and IT specialists, involved in the development of AI systems and tools for project management.

The adoption of AI is rapidly expanding. Mainly known as the ability of a machine to perform cognitive functions associated with human mind and reasoning, AI includes capabilities that enable AI to solve business problems, including in projects. Global survey AI in PM listed over 35 questions and more than 65% of the respondents mentioned their organizations as having AI embedded in at least one of their standard project management flows or planned to be adopted in the next 3 to 6 months, while 56% of respondents reported to have AI as part of their digital transformation strategy.

All over the world, companies and professionals are beginning to harness these technologies and start to feel their benefits. Almost 80% of the total 295 participants in the Global Survey live in Europe followed by 16% which are in Asia and Middle East, 4% from America and less than 1% from Australia or Africa. Most respondents whose companies have deployed AI in a specific function report achieving value from that use, embedding AI into multiple business units or functions. In terms of the results, over 67% of the respondents are working in roles within technology and business service industries; 7% are working in engineering and construction, 5% in automotive and 4% in government and public sector, the rest of 16% are in other various roles within industrial manufacturing, education, energy and utilities, healthcare, agribusinesses and food production.

In terms of the roles of the respondents within the organizations, 24% are represented by project/ programme/ portfolio managers or directors and other 24% of the respondents are currently working as IT/IS professionals which include solution architects, AI professionals, developers and testers. The executive and functional managers have represented 19% and other 25% are having experience as

team members in specialized roles such as scheduler, risk manager. There are also 8% who are currently agile leaders or PMO directors.

The ethical standards involving the human participants were met. An informed consent was obtained from all participants in the survey and data is completely anonymized.

4. Main Findings of the Global survey

While the adoption of AI is still in its early stages, the survey reveals that it's already meaningful in terms of "empowerment" rewards. When respondents were asked about the value of empowerment and when it comes to driving decisions in implementing Artificial Intelligence technologies within project management, the results are encouraging. 33% of the respondents have the perception of empowerment or are extremely empowered, 28% remain neutral and 38% don't feel empowered or feel not at all empowered.

In terms of decision level regarding the implementation of AI technologies, most respondents (45%) see the Executive as the right level of decision, followed by 19% who consider the project or programme governance level as the right decision body. Functional level was selected by 14% and only 12% consider the project team as the proper level for implementation decisions. And for only 9% of professionals it's still unclear where the decision should occur, where the clear strategy and mechanisms of communication should be developed.

The most important factors acting as drivers for adopting AI technologies in PM, based on their importance are presented in figure 1.

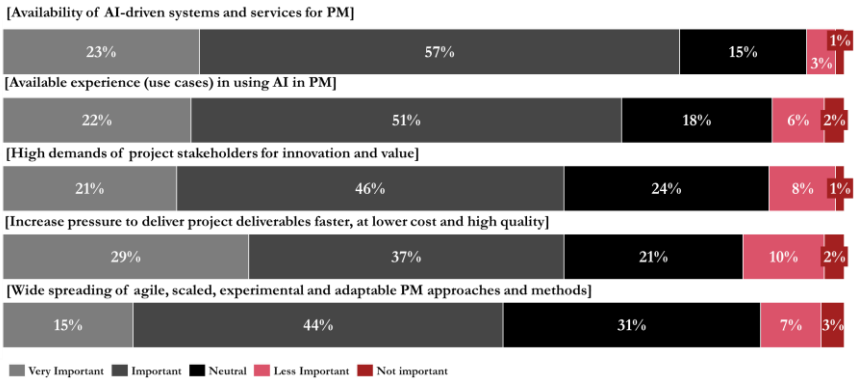

Figure 1. The main drivers of AI adoption in PM

Source: Authors' own contribution

The first three reasons for adopting AI in PM which were indicated by more than half of the participants in the survey (figure 2) are linked to the needs in increased productivity which will free up project managers allowing them to focus on more important decisions (53%), followed by better decision-making

capabilities (52%) and the necessity to improve overall project performance and reporting (51%). As a conclusion to these answers, respondents indicate the time gained for strategy related issues as an important benefit.

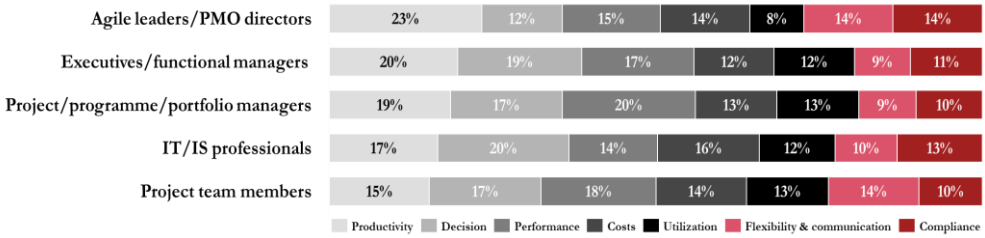

Figure 2. Expected benefits of AI adoption in PM, as perceived by respondents with different roles in organizations

Source: Authors' own contribution

Although AI adoption advances, foundational barriers remain, at least in terms of perception (figure 3). When asked about the current barriers in using AI tools in project management, a majority of 70% of the participants in the survey indicated the limited understanding of AI technologies as the main barrier, followed closely by 62% which have difficulties in deciding the best AI applications, due to limited experience. Data privacy, digital ethics and security risks represented the third identified barrier and the limited IT capabilities such as IT technical skills, standard IT processes/procedures, IT infrastructure were indicated in 58% of the answers. The fifth main barrier is the large number of AI solutions that are not mature enough for the full deployment.

Figure 3. The main barriers in adopting AI in PM

Source: Authors' own contribution

One of the key findings was related to the main project management practices that could benefit from the AI solutions which showed that time, quality, change and transformation are the first options when we speak about process automation (figure 4). One critical enabler of AI is a company's progress during its digitization journey, in order to fulfil the accomplishment of all above 3 attributes: time,

quality and change. Usually, the organizations that have made the most progress in digitizing core business processes are also on the leading edge of AI adoption. Chatbot assistants could also be a solution for better stakeholder's management and could have positive results in organization and information. When it comes to augmented analytics, risk, quality, plan and control are the main practices benefiting from the AI adoption.

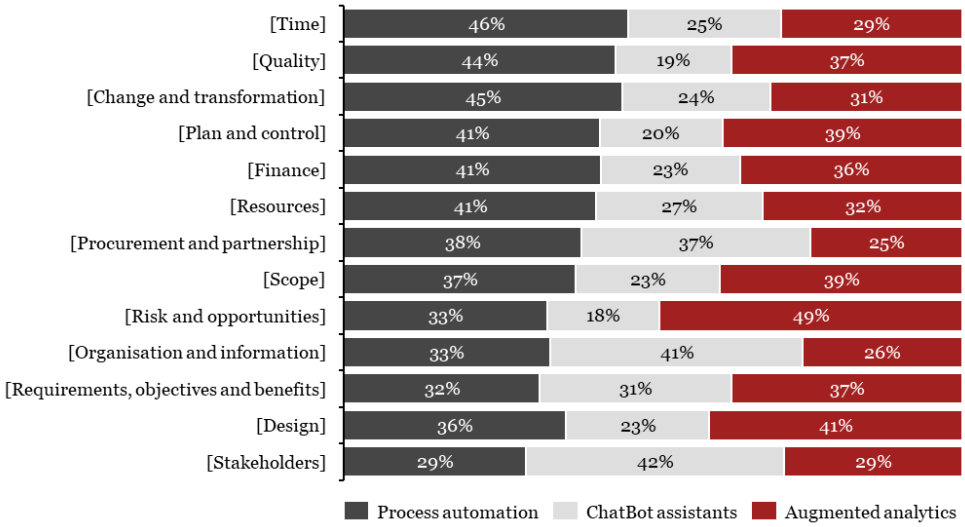

Figure 4. The expected impact of AI adoption in PM

Source: Authors' own contribution

As signalled in the survey, the most probable role that AI tools will have in project management is expected to be either that of an advisor according to 44% of the participants in the survey, or of an assistant of the project manager with more than 52% of the responses.

5. Discussions and Conclusions

Artificial Intelligence adoption is facing many challenges, from the impact of current models and associated barriers which shows signs according to which it will be overcome in the following years, to the disruptive nature of current technologies which are changing the project management models in both public and private sectors. Looking ahead, the survey results suggest that digitization and certain foundational practices are critical to creating value from AI and enabling progress. The implications related to adoption of AI are significant, but for many companies, they involve transformation-level changes to the very business processes at the core of the company and new ways in which people, with different capabilities, will work.

Considering that executive level is perceived by most of the respondents as the right level for decision taking in relation to AI adoption, the frameworks and models to be applied are mainly those addressing the organizational behaviour, such as: TOE framework, absorptive capacity models and dynamic capabilities models. It is different from other ICTS, to which the models of users' behaviour are usually preferred. The models of organizational behaviour appear to be adequate to cover the main drivers and barriers of AI adoption, which allows us to consider that there is no need to develop new frameworks and models for the adoption of disruptive technologies in the project management domain.

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References

[1] Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation, *Administrative Science Quarterly*, pp. 128-152.

[2] Cyert, R. M., & March, J. G. (1963). *A Behavioural Theory of the Firm*, Eng. Cliffs, New Jersey.

[3] Davis Jr., F. D. (1986). A Technology Acceptance Model for Empirically Testing new End-user Information Systems: Theory and results, In, *Massachusetts Institute of Technology*.

[4] Edquist, C., & Riddell, W. C. (2000). The Role of Knowledge and Innovation for Economic Growth and Employment in the Information and Communication Technology (ICT) era, In: Rubenson, K., and Schuetze, H. G. (Eds.) *Transition to the Knowledge society: Policies and Strategies for Individual Participation and Learning*. Vancouver, Canada.

[5] Farrell, J., & Saloner, G. (1985). Standardization, Compatibility, and Innovation, *The RAND Journal of Economics*, pp. 70-83.

[6] Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research*, Reading, Mass., Addison-Wesley.

[7] Goodhue, D. L., & Thompson, R. L. (1995). Task technology fit and individual performance. *MIS Quarterly*, 19, pp. 213-236.

[8] Griliches, Z. (1957). Hybrid corn: An Exploration in the Economics of Technological Change, *Econometrica: Journal of the Econometric Society*, pp. 501-522.

[9] Iacovou, C. L., Benbasat, I., & Dexter, A. S. (1995). Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology, *MIS Quarterly*, pp. 465-485.

[10] Mansfield, E. (1961). Technical Change and the Rate of Imitation, *Econometrica: Journal of the Econometric Society*, pp. 741-766.

[11] Nelson, R. R., & Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*. Harvard University Press, Cambridge, MA.

[12] Ricardo, D. (1817). On the Principles of Political Economy and Taxation, In Sraffa, P. (Ed)., *The works and correspondence of D. Ricardo*, 1, Cambridge Univ. Press

[13] Rogers, E. M. (1962). *Diffusion of innovations*, Free Press of Glencoe.

[14] Scherer, F. M., & Ross D. (1990). *Industrial Market Structure and Economic Performance*, 3rd ed., Boston: Houghton-Mifflin.

[15] Schumpeter, J. A. (1942). *Capitalism, Socialism and Democracy*, 36, Harper & Row, New York, pp. 132-145.

[16] Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70, pp. 65-94.

[17] Swan, T. W. (1956). *Economic Growth and Capital Accumulation. Economic Record*, 32, pp. 334-361.

[18] Taylor, S., & Todd, P. (1995). Decomposition Crossover Effects in the Theory of Planned Behaviour: A Study of Consumer Adoption Intentions, *International Journal of Research*, 12, pp. 137-155.

[19] Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic Capabilities and Strategic Management, *Strategic Management Journal*, pp. 509-533.

[20] Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). *Processes of Technological Innovation*, Lexington Books.

[21] Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions, *Decision Science*, 39(2), pp. 273-312.

[22] Venkatesh, V., & Davis, F. D. (2000). A theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, *Management Science*, 46, pp. 186-204.

[23] Venkatesh, V., & Morris, M. G. (2000). Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behaviour, *MIS Quarterly* (24:1), pp. 115-139.

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Business Agility – the Key for Building Innovative Solutions in an IT Organization

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Abstract

With technology advancing so fast, the Agile way of working has become the norm for most companies in the IT market. Faster time to market, flexibility, and better predictability are known to be just a few of the benefits generated by the Agile approach. Nevertheless, many companies are still struggling to apply Agile in a successful way. While many factors can cause this, this article focuses on a crucial, yet not an intensely debated mistake - applying Agile only at the operational level, without extrapolating it on the strategy, tactics, and culture.

This article is a case study based on two-year qualitative (>300 observation and interview sessions) and quantitative (> 220 respondents at a survey) research carried out inside two IT organizations, Metro Systems Romania and Metronom Germany, during their business Agility transformation. Based on this practical example, the article illustrates that Business Agility is very hard to achieve by adopting Agile only on the operational level. For that reason, organizations need to consider innovative practices like an outcome-driven, flexible objective definition, empowered teams, a data-driven mindset, and behaviour, flat structures, mastery of the product management discipline.

Keywords: Business Agility, Agile strategy, Agile culture.

JEL Classification: C90, D02, D80

1. Introduction

The Manifesto for Agile Software Development (Kent et al., 2001) arose as a response to a series of limitations of the traditional way of working, known as Waterfall. A few of the waterfall methodology's most common limitations are the long time to market, poor customer collaboration, limited flexibility, and customer-centricity.

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The Manifesto defined the Agile way of working as a set of values and principles that support risk mitigation, effective customer collaboration, faster time to market, and the ability to adapt to customer-evolving needs.

Considering the pace of change in the IT industry, more and more companies realized the urgency to respond faster to customer changing desires, without having the luxury to wait a few years in order to build a perfect product, which by the time it is ready, will become obsolete. Since the Agile way of working seemed to address these needs, it became prevalent for the software development industry companies.

However, many companies have started a transition program from Waterfall to Agile, without truly understanding its value. This approach led to resistance to change, decreased motivation, and ultimately to unmet expectations. While many factors can impact Agile adoption's success, this article focuses on a specific one - adopting Agile only on the operational level, without extrapolating it on organizational strategy, tactics, and culture.

For better exemplification, the article focuses on Metro Systems Romania and Metronom Germany, two companies with more than one thousand employees that work together to provide Metro Cash and Carry with the needed IT solutions for 26 countries across Europe and Asia. The article is a case study that reveals these companies' journey towards true business agility - their limitations in applying agile only at the operational level and the steps they need to perform to overcome them.

2. Problem Statement

Since Agile methodologies like Scrum, Kanban, SAFe, and XP became more and more accessible for the IT organizations, they started to be mistakenly perceived as the only step that needs to be considered for successfully adopting Agile at the organizational level.

According to the 14th Annual State of Agile Report (Version One, 2020), the main reasons for adopting Agile are accelerated software delivery, enhanced ability to manage changing priorities, increased productivity, better alignment between business and IT, and increased software quality. All of these benefits influence the delivery teams' way of working, helping them to improve their efficiency, predictability, and flexibility. On the other hand, applying Agile methodologies only on the delivery teams level means to achieve just an operational Agility, without considering other organizational dimensions like strategy, tactics, and culture.

By neglecting these essential dimensions, organizations may fall into the trap of having Agile teams in a Waterfall organization, which may lead to limitations, confusion, and conflictual situations. It may happen to have Agile delivery teams that can generate value very fast but are slowed down by the organizational procedures, management decisions, and rigid strategies.

The 14th Annual State of Agile Report also presents the main challenges and barriers in adopting Agile successfully. According to the study, the most cited challenges relate to the internal culture of the organization: resistance to change, poor leadership involvement, and inconsistent processes across teams.

Many Agile specialists agree that Agile is, first of all, a mindset that should be extrapolated at all levels, and culture seems to be a well-known challenge for successful business agility. However, many organizations, Agile coaches, and organizational chance agents treat the Agile methodologies' adoption as the final destination of their Agile journey.

While adopting Agile methodologies on the team level is very thoroughly described in the published literature, there is still much room for exploration when it comes to Business Agility and how to successfully achieve it.

3. Research Questions/Aims of the research

This research aims to describe what business Agility is and how to apply it not only on the operational level but also on the organizational level, including tactics, strategy, and culture. It should act as a practical guide for all the Agile practitioners that are interested in getting the most out of their Agile adoption. Firstly, the article will describe the characteristics of Agile organizations that apply Agility at all levels. The second step is to describe the concrete steps that organizations need to make to extrapolate Agility from operational to organizational levels in order to eliminate the risk of having high performing teams working in rigid organizations that are slowing them down. The article presents how to overcome some conflictual situations like:

- Rigid processes and business flows which contravene with some agile values and principles that promote transparency, fast feedback loops and direct communication with the customer;
- Delivery teams not collaborating directly with the customers since some intermediate roles receive the requirements and are responsible for stakeholders' management;
- The old tools, technologies, architecture, and technical dependencies between teams which limit teams' innovation and creativity;
- The decision-making process and objectives setting which are rigid and top-down, without considering teams' lessons learned.

4. Research Methods

The foundation of this study is the theoretical research which drafts a comprehensive understanding of Business Agility. The article summarizes some thought leaders like Marty Cagan, Melissa Perri, Felipe Castro and Eric Ries, who promote very innovative and practical approaches in the art of product management and business Agility.

The study's central pillar is the 4gile Minds Digital Conference organized together with the 4gile Minds community from Metro Systems Romania in May 2020. During the conference, great Romanian and international Agile leaders shared their experiences and created an overall picture of business agility and how to achieve it.

The research's roof is exploratory and practical research - a case study carried out for Metro Systems Romania and Metronom Germany, which reveals the journey

of these two IT companies towards Agility true business. The case study is based on a survey done by the German company − Die Produktmacher − and my personal research, working as an Agile coach for these two companies.

Information about the survey:

- Research methods: Online surveys and interviews with employees;
- Period: September 2019 - April 2020;
- Two different companies − Metro Systems Romania and Metronom Germany, working together in the same group, to achieve the same vision;
- 180 teams included in the survey, >220 respondents;
- Respondents have roles like Product Owner, Developer, Agile Masters;
- Distributed teams across five different locations: Romania (Cluj, Bucharest, Brasov), Germany (Dusseldorf and Berlin), and India (Pune);

Information about my personal research:

- Period: April 2018 - August 2020;
- >50 interviews with Product Owners from Metro Systems and Metronom;
- >100 interviews with team members from Metro Systems and Metronom;
- Participation as a silent observer in more than 200 team meetings to observe their dynamics and way of working;
- >20 interviews with the most essential stakeholders, including management board of the teams to understand their pain points and expectations.

5. Findings

5.1. Characteristics of an Agile organization at all levels

A successful Agile adoption requires applying this way of working at all levels: operational, tactics, strategy, and culture.

The principles that describe an Agile culture are:

- Fail-fast: "A modern company rewards productive failures that lead to smart changes in this direction and provide useful information" (Ries, 2017, p. 40);
- Autonomy, transparency, and accountability at all levels;
- Continuous inspection and adaptation and short feedback loops.

The principles that describe an Agile strategy are:

- Iterative, empirical and flexible planning, which allows fast adaptation;
- Defining and validating hypothesis very fast, in a Lean Startup way;
- Flexible and outcome driven process for objectives definition
- The principles that describe Agile tactics are:
- Data-driven decisions and validated assumptions;
- Continuous-improvement approach;
- Experimentation and lessons-learned.

Table 1. Operational Agility vs Business Agility

	Operational Agility	**Business Agility**
Culture	Top-down, Command and Control	Autonomy, Transparency and alignment at all levels
Strategy	Annual, Static Planning	Empirical and iterative, Data-driven planning
Tactics	Big, non-validated bets, long feedback cycles	Experiments, fast feedback loops, Lean Startup principles
Operational/delivery	Agile Development	Agile Development

Source: adapted from Felipe Castro (2017),
URL: https://felipecastro.com/en/okr/okr_and-agile/

The above table describes the difference between an organization that applies Agile only at the operational level and an organization that values Agility at all levels - including culture, strategy, and tactics.

Given that culture is the only intangible, unmeasurable aspect, it is also the hardest one to be influenced. In this context, organizations can focus on concrete, practical actions that will generate a change in employees' behaviour and create discipline and success stories.

Once these practices are integrated into the way of working, they will also trigger a cultural change. As Kotter and Cohen (2012) said, "In a change effort, culture comes last, not first."

The attempt to change the organizational values and principles before enabling an environment to support them will cause confusion and frustration.

Nevertheless, culture is a crucial element that should be considered right from the beginning. In a change process, we should have a clear vision about the culture that we want to nourish on the organizational level, without waiting to figure it out on the way. Our culture should guide our strategy, tactics, objectives, and day to day activities.

Understanding that the cultural change comes last will help the organization define the right priorities and expectations during their transition process. It is vital to find a balance between our vision - where we want to go - and how we communicate it to the company, supporting it with the rights methods and behaviours.

In this context, the next part of the article is a detailed description of the steps done by Metro Systems and Metronom on their journey towards business Agility.

5.2. Applying Agile at operational level in Metro Systems and Metronom

Metro Systems Romania and Metronom Germany started their transformation program from Waterfall to Agile in 2015.

Even if they faced significant resistance to change initially, the most common Agile methodologies like Scrum and Kanban are integrated now by the delivery teams in their day to day work easily and naturally.

However, many teams do not succeed in creating solutions that truly address their customers' needs.

Even if adopting the Agile methodologies at the operational level generated significant benefits, the General Maturity level after five years, in terms of business agility, shows that there is much room for improvement in some specific areas. Figure 1 reflects the results of the survey and the maturity level on each dimension.

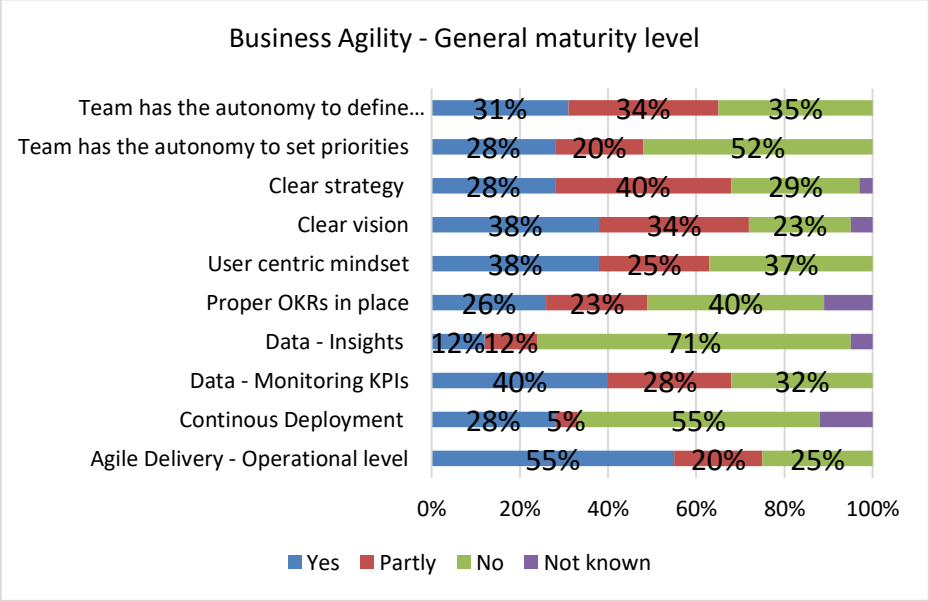

Figure 1. Business Agility level in Metro Systems and Metronom
Source: adapted from Die Produktmacher survey

5.3. New vision and actions towards Business Agility in Metro Systems and Metronom

Two years ago, Metro Systems and Metronom started their journey in extrapolating Agility at all levels. In this context, they started to explore a new challenging perspective - to switch for a purely IT-driven organization to a Product driven organization, led by business agility. Instead of being a demand-driven organization that implements all the customers' requirements, they want to be a value-driven organization that understands customers' needs and come up with innovative ideas on how to solve them.

The main steps done in the last year by these two companies, in achieving their vision are:

- **Adoption of the OKR (Objectives and Key Results) methodology at the company level**

Organizations should adopt a customer-centric culture in a very competitive market, which enables them to value the outcome more than the output. This way,

they avoid falling into "the build trap," which makes them create more features to respect their deadlines instead of meeting their customers' needs (Melisa Perri, 2018). OKR is a methodology that promotes alignment, flexibility, and a sense of purpose and helps the teams understand how they can contribute to the company's overall vision by setting outcome-driven objectives based on their specific context.

Defining the same set of OKRs, Metro Systems and Metronom managed to bring more clarity at all levels, improved the alignment between dependent teams, and between the teams and the higher levels (vertical and horizontal alignment).

Moreover, OKR methodology enables short feedback loops and a higher degree of flexibility since the objectives are planned only for six months iteration. Each iteration ends with a progress review meeting, followed by a retrospective.

- **Involving customers in the OKR definition**

Once Metro Systems and Metronom applied OKR at the organizational level, they also managed to extrapolate it at the customers' level. Instead of placing requirements about the concrete features that the teams need to implement, customers define objectives and key results that describe the expected outcome (value), not the output (features delivered).

Once the customers' needs and expectations are precise, the teams can decide how they can contribute to achieving them, and adjust their set of OKRs based on it.

- **Defining VMOSA (Vision, Mission, Objectives, Strategy and Actions)**

A strong product organization, led by business agility, needs effective product management. “Product management is an interdisciplinary role that enables teams to plan, design, and continuously bring better products to the market “(Moore, 2019).

Instead of being just an intermediate between the business and the IT teams, translating their requirements into a product backlog, the product owner role starts to earn more autonomy and ownership. The product owner should continuously engage in a discovery process to understand the customer needs, desires, and pain points and define, together with the team, which is the best way to solve them.

5.3. Recommendations for Metro Systems and Metronom

Considering the results of the survey and the steps that the Metro Systems and Metronom already did toward business agility, there are still some vital dimensions that they can improve.

- **Enable a data-driven mindset and behaviour at all levels**

Business Agility promotes continuous exploration and adaptation, failing fast, defining, and validating hypotheses in a Lean Startup way, maximizing value, and minimizing waste. For that, companies need to make informed decisions based on real-time, objective metrics.

An essential process that can be applied is called The Lean Product Analytics, described by Olsen (2015): Define your key metrics, measure baseline values for them and evaluate ROI potential for each one of them. After that, you need to decide

which is your top metric to improve and focus on improving it while iterating and learning.

- **Improve teams' autonomy to make decisions**

Currently, the requirements coming from the stakeholders have priority in teams' backlog. Even if the teams define concrete OKRs, based on customers' OKRs, there are still other requirements that appear during the iterations, which were not included in the initial planning.

The trust level between business and IT needs to be improved and, as Cagan (2019) said, product teams should be "empowered to figure out the best way to solve the problems they've been asked to solve."

For that, the companies need to grow effective product management skills, to improve delivery and the discovery process.

- **Improve product management skills**

The product owners from these companies are currently highly involved in the delivery part: write down and prioritize the user stories, their acceptance criteria, and how each feature should look like in detail. Companies that value true business agility empower the teams, give them the freedom and autonomy to decide how the best solution should be designed and developed, while the product owner is highly involved in the discovery part. This part is about exploring the customers' needs, behaviour, pain points, and desires, interviewing them, empathizing with them, and understanding what is going on in their daily activities. The product owner is responsible for defining the right product, while the development team is responsible for developing it right (Cagan, 2017).

Engaging the product owners in the discovery process is an essential part that needs to be improved in Metro Systems and Metronom - it may be the key to achieving the business agility that these companies are looking for.

6. Conclusions

Agile methodologies adopted at the team level help companies achieve great benefits like faster time to market, better flow efficiency, predictability, and the ability to respond faster to the customer changing desires. Moreover, they create discipline, transparency, and improve team motivation. Nevertheless, applying Agile at the operational level, without extrapolating it at all levels of the organization, may generate confusion and limitations and become an obstacle for successful business Agility. While adopting the Agile methodologies (like Scrum, Kanban, SAFe, XP) generates excellent improvements on the delivery level, discovery is another essential dimension that needs to be considered to achieve real business Agility. For that, organizations need to focus more on defining an insightful vision and mission for their products, adopting a flexible and iterative objective definition process (OKR methodology), make informed decisions based on data (Data-Driven mindset and behaviour), empower the product teams to come up with innovative solutions and improve the product management discipline on the organizational level. Autonomy, alignment at all levels, fast feedback loops, validated experiments, and transparency

are the vital elements that characterize the culture, strategy, and tactics of an Agile organization and define business agility as a direction, not a place.

References

[1] Cagan, M. (2017). *INSPIRED: How to Create Tech Products Customers Love*. Wiley.

[2] Cagan, M. (2019). *Product vs Feature teams.* [Online]. Available: https://svpg.com/product-vs-feature-teams/.

[3] Castro, F. (2017). *OKR and Agile – Stop Waterfall goals*. [Online]. Available: https://felipecastro.com/en/okr/okr_and-agile/.

[4] Kotter, J. P., Cohen, D. S. (2012). *The Heart of Change: Real Life Stories of How People Change Their Organizations.* Harvard Business Review Press, ISBN: 1422187330.

[5] Kent et al. (2001). *Manifesto for Agile Software Development*. [Online]. Available: https://agilemanifesto.org/.

[6] Perri, M. (2018). *Escaping the build trap.* O'Reilly Media, ISBN-13: 978-1491973790.

[7] Ries, E. (2017). *The Startup Way.* Penguin. ISBN: 978-1101903209.

[8] Version One. (2020). *The 14th Annual State of Agile Survey*. [Online]. Available: www.stateofagile.com.

[9] Moore, J. (2019). *Product Management: How to create Real Value with Effective Product Management*. Independently published, ISBN-13: 978-1686901126.

[10] Oslen, D. (2015). *The lean product playbook.* Wiley; 1st Edition (June 2), ISBN-13 : 978-1118960875.

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Digital Transformation for Public and Private Organizations Challenges and Opportunities for Romania

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Abstract

As a result of the analysis of the Digital Economy and Society Index (DESI), Romania is next to the last European Union countries. It seems that our country needs to take immediate action for the promotion and integration of digital services by public and private actors. One of the main pillars for Romanian long-term socio and economic development should be digital transformation of public institutions and support for all private sectors to integrate digital technologies. As all transactions and information exchange can be supported by electronic means, the use of electronic signatures is one of the most important factors to be strengthened. We consider that the new challenges faced in order to implement digital transformation within emergent countries as Romania will be raised by people's education, change of mindset and adaptability to an environment focused on automation capabilities. The objective of this paper is to review the existing scientific opinions, having a short analysis of Romania's status, in terms of digital transformation and identification of a possible approach for conducting transformation, which integrates the need of people's education for transition to a more digitalised economy.

Keywords: Digital Transformation, Electronic Infrastructure, Education.

JEL Classification: A1

1. Introduction

Romania, ranking next to the last European Union countries in terms of digital transformation, according to Digital Economy and Society Index (DESI index), has an open action line, but it must continue to adopt and implement structural changes in order to facilitate the integration within the Digital Single Market. The evolution of markets is the primary factor that will influence the decision and orientation of the digital economies. Romania will have to accelerate its investment attractiveness, provide predictability, support domestic creative industries, research, development and innovation and safeguard the domestic skilled workforce (Gaftea et al., 2017).

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It seems that Romania needs to take immediate action for the promotion and integration of digital services by public and private actors. Countries leading in digitisation scorecards were involved in the implementation of electronic identification and electronic signatures, one stop platforms, self-service mechanisms, agreements with governmental institutions for time efficient interactions, education; the most developed countries are those leading in terms of digitisation thanks to investments in human capital, in infrastructures and in the adaptability of innovation technologies (Price Water House Coopers, 2018).

I consider that one of the main pillars for Romania's long-term socio and economic development should be the digital transformation of public institutions and the support for the private sector to integrate digital technologies in all business sectors. As all transactions and information exchange can be supported by electronic means, the use of electronic signatures is one of the most important elements to be implemented both by state institutions and private sector.

Electronic signature is needed in all electronic transactions, electronic agreements and it also supports the disruptive technologies which are available today (eg. blockchain, internet of things, artificial intelligence, etc.). The creation of the necessary framework for electronic signatures to be used, implemented and largely embraced is an action recommended to be taken immediately by all actors. In order to increase the use of electronic signature, some measures should be adopted: stimulation of the use of electronic infrastructures, boost of people's trust, adapted legal framework, education of people.

The challenges for implementing the digital transformation within emergent countries as Romania are raised, in my opinion, by people's education and by change of the mindset, by adaptability to an environment focused on automation capabilities, e-response mechanisms and cyber risks assessment.

The objective of this paper is to review the existing scientific opinions, to have a short analysis of Romania' s status, in terms of digital transformation and to identify a possible approach for conducting transformation.

2. Problem Statement

Digital transformation is a complex, transformative, synergistic and multi-disciplinary process that involves changing business processes, by implementing new technologies in all activities and at all levels of the economy, with the participation of all parties of the public and private environment.

It is not only a matter of opportunity to support digitisation of all social and economic sectors. but a critical necessity due to current evolution of global markets, industries and public activities.

At Romania's level, building an articulate strategy and finding the means to support integration of digital technologies and the tools to be used for determining the rapid increase of digital use of private or public services is essential. While analysing the current status, it is critical to understand the shortages and possible measures to be adopted.

For the transformation to be effective, an implementation of digital policies for private and public sector, through coordinated and synergistic actions which should be socially embraced, is highly needed.

3. Research Questions/Aims of the research

The paper takes brief insights of the digital transformation status in Romania by including a short evaluation of the context and of the existing opportunities. Dealing with such a complex subject, with implications within all economic and state sectors, including education and public services offered to citizens, requires having a clear view of the existing scientific literature, what is aimed at, and which possible leads might be available.

The aim is to identify and present a possible synergic, transversal and multi-disciplinary approach for articulating and conducting the digital transformation, which integrates the need of education and people's embrace of the transformation for a transition to a more digitalised economy, while outlining the role of the use of electronic signatures, as part of the digital transformation strategy and the role of education.

4. Research Methods

In terms of research, the present paper represents the base for a broader study regarding the challenges and opportunities brought by digital transformation for Romania.

The research is based on the review of the existing scientific publications; a short analysis on the status of Romania's ranking amongst the EU countries is enlisted. The aim is to identify supporting factors which may leverage the increase of digital transformation speed.

The paper has resumed to analyse what is nowadays written on the topic and the author's point of view of a possible approach to be made.

5. Findings

The Digital Economy and Society Index (DESI) has been monitored by the European Commission since 2014 and it is reported since then; detailed information on each Member State's digital progress has been presented for understanding the value of the combined quantitative evidence from DESI indicators across the five dimensions of the index with country-specific policy insights and best practices (Digital Economy and Society Index, 2020).

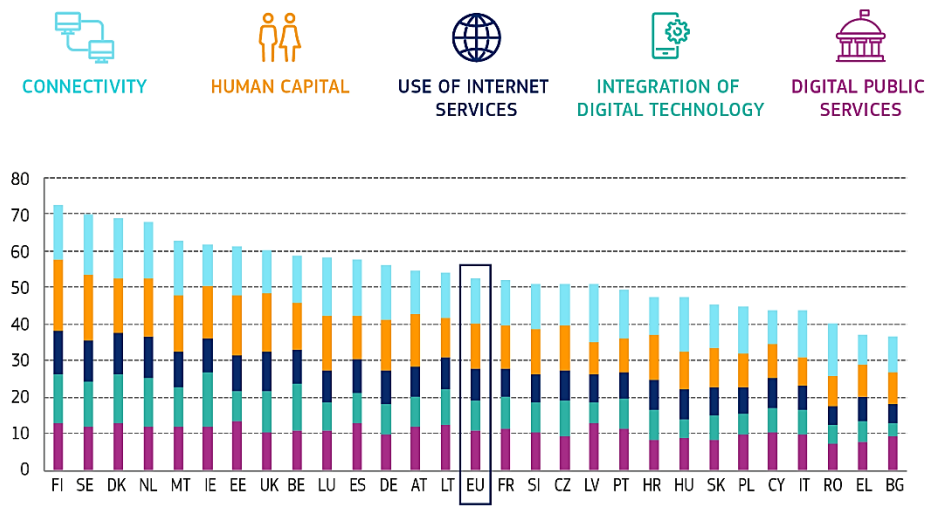

Figure 1. Digital Economy and Society Index 2020
Source: https://ec.europa.eu/digital-single-market/en/desi

As a result of the analysis of the Digital Economy and Society Index, Romania is next to the last European Union countries. The indicator reflects the fact that Romania performs good on Connectivity dimension, thanks to the high take-up of ultrafast broadband and the wide availability of fixed very high capacity networks. However, digitisation of the economy is ranked behind on Digital public services; for the Use of internet services, Romania has the lowest performance amongst the EU Member States.

In terms of digitisation, Romania ranks 27th among EU countries in terms of the integration of digital technology by businesses, well below the EU average. As it results from the above-mentioned analysis, only 23% of Romanian enterprises share information electronically, while only 8% use social media.

Analysing Romania's performance, as compared to the other EU countries, based on the benchmark established by DESI (Digital Economy and Society Index Thematic Chapters, 2020), Romania:

- performs best on Connectivity dimension, thanks to the high take-up of ultrafast broadband and the wide availability of fixed very high capacity networks. 49% of Romanian homes subscribe to ultrafast (at least 100 Mbps) broadband, the fifth highest figure in the EU;
- is well positioned as regards ICT graduates, as it ranks fifth, with 5.6% of all graduates (EU average: 3.6%);
- in terms of Digital public services and the use of internet services, Romania has the lowest performance among the EU Member States;
- only 23% of Romanian enterprises share information electronically, while only 8% use social media.

It seems there is a Romanian paradox which is difficult to be explained, but this context may bring challenges and opportunities as well, if rightly addressed.

The recent lockdown brought new highlights on the importance of digital capabilities and skills of both private and public entities to support challenging times and perspectives at a global level.

A study made during the first semester of 2020 by Price Water House Coopers shows that, at Romania's level, out of the questioned companies, 37% stopped their activities partially or totally and 27% will benefit of a technical unemployment program. Teleworking became possible for Romania, during the lockdown for many companies thanks to the digital infrastructure which was available and thanks to their employees who were well trained and had digital competencies (Sas, Price Water House Coopers, 2020).

What's to be noted is that electronic infrastructures and people's capabilities made the difference in the process of adapting to the crisis circumstances.

In my opinion, it is not only a matter of opportunity to support digitisation of all socio and economic sectors, but a critical necessity due to the current evolution of global markets, industries and public activities.

Understanding and analysing the context raises an inter and multidisciplinary approach to holistically identify all challenges (Turcan, 2015). This means that a synergistic approach would be of value not only for understanding the current status, but also for identifying a possible future approach.

There are several dimensions of the digital transformation: a dimension given by the electronic infrastructure used, the technological innovations that are available to be incorporated, a dimension given by the usage of technologies in the economy for value added production (current trends are blockchain, data analysis, artificial intelligence, 5G broadband, the internet of things, automation, robotics, cloud computing), a social dimension, which is transformative and, of course, the dimension of people's education.

The technical solutions can be used by building necessary infrastructures or outsourcing such activities to authorised companies acting in this field. Interconnectivity of public institutions will have a significant impact on efficiency and simplification of processes, ease of due payments, introduction of a main point of contact for public services, new platforms for central bodies of the state, exchange of information between entities and citizens with the public sector. The benefits of the use of digital technologies, by cut of timing and less paper consumed can be presented together with the opportunity of designing new flows for e-documents' creation and digital storage infrastructure to be built. Programs for all transformative initiatives can be created by public institutions and the mechanisms should be used in close connection for public-private sectors.

Infrastructure is important when dealing with new workflows and the benefit of innovation would bring competitive advantages and satisfaction for customers or citizens when using public services. The speed of transactions or exchange of information, when needed in real time, can bring increased efficiency, cut of paper costs, cut of operational costs resulting from the physical administration of

documents or work flows, agencies at the price of electronic flows and processed being created and supported by entities together with the creation and administration of cyber risks, security and IT related risks as well.

The existing processes can be analysed and transformed by including electronic components such as infrastructure, workflow, people, skills, electronic storage, cyber security, legal rules.

The organizational change is a process and not an event and sometimes, even when being motivated by rapid developments in technology, the change produces such profound developments that companies struggle to adapt (Principles of Management, 2015). Therefore, support from governmental bodies for education and for electronic infrastructure's implementation during the transition period is decisive.

All transactions and information exchange made in an electronic format needs electronic signatures and this highlights the importance of the integration of this type of signatures both by state institutions and private sector; signing in electronic format brings benefits by cut of timing and less paper consumed at the cost of designing new flows for e-documents creation, digital storage infrastructure to be built and new security rules to be applied.

The use of electronic signatures is also one of the most important factors which facilitate e-business, e-commerce, e-banking, e-government, e-school, e-justice. Therefore, we consider that supporting transition to a fully digital transactional environment is essential for the current stage of digital transformation.

Romania needs to improve the consistency of the national digital transformation strategy for enterprises and for the public sector. The strategy should be more clearly focused and coordinated actions for its implementation must be taken.

Implementation of digital technologies should be programmed considering the socio and economic impact as well as the dynamics of the public policies.

The legislative framework often brings lack of clarity and unanimous interpretation of the established rules and this is a factor that discourages use of electronic documents and electronic signatures.

The regulatory framework, both at European and national level, should reflect the reality of technological development; it often lags behind, failing to fully capture the innovative aspects of using new technologies. Important European regulations have been adopted on e-commerce, electronic payments and instruments, electronic document management and electronic signature, eLearning, teleworking, personal data processing, electronic communications, cyber security. Challenges continue to be raised by the regulation of taxes, copyrights, platform accounting, competition in the digital economy. At national level, legal rules have been transposed, implemented or adopted in the spirit of the European ones but the process of amending and updating the legislation is a complex and a continuous one.

In terms of electronic signature regulation, Romania failed to adopt an internal legislation for harmonising existing rules to Regulation (EU) No 910/2014 on electronic identification and trust services for electronic transactions in the internal market, (eIdas Regulation, 2014); digital IDs which incorporate electronic signatures

are not yet regulated. The existing national law, (Law no. 455, 2001) on the electronic signature is outdated and needs immediate modification.

Until recently, when an emergency ordinance (OUG no. 38/2020) regarding the use of electronic documents at the level of the public institutions and authorities was adopted, the public institutions were lacking a general legislative framework for developing public infrastructures for signing documents, exchange of data and acceptance of electronic documents as valid legal documents. The timid start of fiscal exchange of information introduced in 2016 was periodically updated and new operations were designed.

Regarding cybersecurity, measures for operators of essential services are applicable since 2019; it aims to increase the level of awareness and ability to cope with computer security incidents and to increase citizens' trust in the digital single market.

The main changes in human history are the four social revolutions: domestication, agriculture, industrialization, and information; discussing how technology changes society, the major thesis is that because technology is the organizing force for social life, when it changes, its effects can be profound. (Mutekwe, 2012).

The complex diagram of digital transformation cannot be operationalised unless technology, legal framework and conceptual change are embraced by people who can see the value of the change, the opportunities brought by transformation on a medium- and long-term basis. Therefore, people's education plays a very important role.

The impact of the innovative technologies is huge and thus, for supporting transformation, people' s education is essential. The impact of new technologies on education is major. On the one hand, it is necessary to increase the level of awareness and education regarding the implementation and use of new technologies and on the other hand, the educational process, as part of the transformation, needs to be adapted to current requirements, evolving from the use of traditional methods to the incorporation of support technologies in education (e-learning, as an accessible tool) and even − to some extent – to artificial intelligence, which brings challenges in terms of implementing platforms to facilitate communication and interconnection of people, with digital content, flexible, focused on development of management skills.

Support from public institutions can be initiated through programs for inclusion of digital technologies in all sectors, stimulation of the implementation and operation of digital platforms, of e-learning, of teleworking.

In order to deal with such challenging factors, transformational leaders are needed too. The concept of transformational leadership was introduced in 1978 as a process in which leaders and followers help each other to advance to a higher level of morale and motivation (Burns, 1978). The focus is on knowledge, on intellectual competence, on technical and socio-emotional talents, on interpersonal competencies and this type of leadership is needed.

The digital transformation will lead to the creation of new competencies and new professions and for this to happen, the leaders should know the value of knowledge transfer and advanced technologies.

Thus, it seems that the complex processes of digital transformation should be planned considering all factors that can be of support or of any opposition, including taking into account their socio impact on people's lives.

The digital transformation strategy should be thoughtfully programmed and considered with regards to all factors which may impact the change process.

It may be coordinated from the level of the Romania' s state authorities through dedicated teams made of experts from various fields of activity who work together and for the benefit of sharing the knowledge and experience they have. The necessary expertise to be addressed is coming from computer science experts with skills in both infrastructure and internet telecommunication areas, cyber security experts, business affairs experts or representatives of the relevant business areas, legal experts, sociologists, psychologists, public policy experts, project managers, teachers. The outcome brought by best practices shared and by the involvement of a transversal team of experts may bring advancement in the process and may optimize the business potential Romania has.

The social impact of any change cannot be ignored, and people's education is a key factor; therefore, programs for education are to be designed and implemented. Policies on education should support the training of skills needed for digital transformation, the development of the educational process, the creation and development of new professions.

6. Conclusions

The paper offers a brief presentation of the digital transformation status in Romania, enlisting the most important opinions identified by the author in the scientific literature. It offers a possible synergistic, transversal and multidisciplinary approach for designing and conducting implementation of digital transformation, for integrating the need of education and people's embrace of the transformation for transition to a more digitalised economy.

Although the objectives of the paper are met, further documentation and analysis might be needed (eg a focus group research made with the contribution of experts and representatives of all business areas, public policy makers, experts in education, sociologists, may validate the approach and may bring valuable insights for further strategy development in Romania).

References

[1] Burns, J. M. (1978). *Leadership*. New York. Harper & Row, retrieved https://www. langston.edu/sites/default/files/basic-content-files/TransformationalLeadership.pdf.

[2] Collection of Authors (2015). *Principles of Management*, University of Minnesota Libraries Publishing Edition, Minneapolis, Mn, retrieved https://courses.lumenlearning .com/principlesmanagement/.

[3] Digital Economy and Society Index (DESI) (2020). retrieved https://ec.europa.eu/digital-single-market/en/scoreboard/romania.

[4] Digital Economy and Society Index (DESI) (2020). *Thematic chapters*, retrieved https://ec.europa.eu/digital-single-market/en/desi.

[5] Gaftea, V.-N. (coord.), Ionita, A., Nitu, I., Popa, I.-F. (2017). Romania and the Digital Single Market of the European Union. Challenges and Opportunities, European Institute in Romania, *Studies of Strategies and Politicies*, SPOS 2017, Study number 3, pp. 9-10.

[6] Mutekwe, E. (2012). The Impact of Technology on Social Change: a Sociological Perspective, Journal of Research in Peace, Gender and Development, *International Research Journals* (ISSN: 2251-0036), 2(11), pp. 226-238, November, retrieved http://www.interesjournals.org.

[7] Price Water House Cooper's (2018). *Study on the Implementation of Digital Transformation in Romania*, p. 4 & 14, retrieved https://media.hotnews.ro/media_server 1/document-2018-10-11-22752549-0-studiu-guvernare.pdf.

[8] Price Water House Cooper' s (2020). PWC *Study Regarding Pandemic's Effects on Business*, retrieved https://www.pwc.ro/ro/media/press-release-2020/studiu-pwc-privind -impactul-pandemiei-covid-19-asupra-afacerilor.html.

[9] Turcan, G. (2015). *Interdisciplinarity in Social Sciences*, retrieved https://irek.ase.md/ xmlui/bitstream/handle/123456789/120/Turcan-G_8-mai-2015.pdf-8.pdf?sequence=1& isAllowed=y.

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Innovation in Family Business

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Abstract

Innovation is one of the pillars of any successful business. Family businesses are portrayed as having a conservative behaviour when it comes to innovation, as this concept comes from the risk taken that can change the history and the reputation of companies and the market trust of their products and services. Family studies have focused so far on the financial elements that gradually shaped family business end performance. But the internal family insights, especially from the psychological and social perspective, which are pushing towards a successful innovation, haven't been explored at length. The aim of this article highlights the relation between family business behavioural insights and successful innovation process, analysed in the context of their different sectors where family businesses are coming from. To bridge the main key drivers behind families and empirical gap to innovation, the Authors have conducted a quantitative study based on a descriptive and statistical interpretation while presenting their findings. The traditions and values of family business, as well as family involvement in the strategic decisions over multiple business plans and family member expertise within their business roles, play important roles for constant innovative success.

Keywords: Innovation, family business, dynamic, development, strategy.

JEL Classification: O3

1. Introduction

Family companies are known as having an impact on the worldwide economies, with strong contribution regarding economic growth and stability, seen as the most organizational "phenomena". They account for approximately 75% from the global economies (Conto et al., 2014; Llach and Nordqvist, 2016; Astrachan and Schanker, 2003; Mandl, 2008; Lindow, 2013; Zellweger, 2017). Still, innovation remains the

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driver force for economic development, characterized by the commitment of the family businesses to innovate, forced by a dynamic environment according to their industry. Innovation represents the entrepreneurial expression of a research and design activity performed by a company. Innovation embraces many forms, from organizational process implementation (Schaper and Volery, 2004), like new technologies and concepts, until extraordinary tangible assets. According to Miller and Friesen, (1983), an entrepreneurial firm is the one which undertakes some risks in its innovative business venture, showing a proactive innovation attitude and becoming finally the leader in its field. There are companies willing to innovate, keeping premium position on the markets and targeting large profits. (Hatak et al., 2016; Kraiczy, 2013; Kraiczy and Hack, 2017). There are advantageous status positions for the pioneer companies, recognized and accepted by the public, but in the same time, there are numerous catastrophic ends for the unsuccessful companies with costly unhappy products, rejected by the public. Although, in the global business competition, as a primary tool, continuous innovation is perceived as a core challenge for the company success. (Llach et al., 2012) and in spite of their successful running operations, family firms are portrayed as conservative leaders (Morris, 1998; Habbershon et al., 2003) when it comes to their innovative behaviour, they behave rather reluctant than with aggressive innovative initiative, as compared to their counterparts, non-family businesses (Economist, 2009; Kraus et al., 2012; Duran et al., 2016). Scholarly research indicated and described the family business as difficult to change in the newest business environment (Lubatkin et al., 2007; Carney, 2005), but in spite this picture, family companies are very successful worldwide, and they do innovate. The aim of this Article is to focus on the influence of family over the process of innovation, by analysing the behavioural insights of the family business.

2. Problem statement

Innovation represents the strategic orientation, the result of an action and not a coincidence; its scope is to bring on the market a change in the business routine, as well as economic benefits through acknowledgment, novelty, qualitative originality, (King and Andreson, 2002; Leenen, 2005; Kraus et al., 2012) and to contribute to the survival of the family businesses, which are unique and have their own traditions, values, patterns, transferred by the family over the business. From the psychological and social point of view, in relation to innovation, researchers revealed three common direction types which lead to conservative behaviour regarding family businesses: (1) family culture influences innovation process (2) conflicts within the family block innovation process (3) involvement of the family is pushing innovation. (Chrisman and Patel, 2012; Lee and Rogoff, 1996; Zahra, 2003; Romano et al., 2000; Naldi et al., 2007). Nevertheless, behaviour of family business comes from their organizational traditions, internal rules and past roots, or their vision on long-term strategy and old running partnerships with the stakeholders; time decision in family business can be longer, as compared to that of non-family companies. (Cioca and Popescu (2019); Lindow (2013); Zellweger (2017). However, family businesses are

innovative and extremely competitive in their business fields, learning from best practices. With respect to their innovative decisions, family business proved to be dedicated in terms of time study and long financial sacrifice (Lee, 2006; Glover and Reay, 2015; Simon, 2009). By reviewing the literature, (Block, 2012; Matzler et al., 2015; Roed, 2016; Suess-Reyes and Roed, 2018; Frank, 2019, the Authors observed that the family business perceive the innovation process for keeping themselves competitive or leaders in their business niche. Many family businesses perceive innovation as part of their corporate strategy. (Kraus et al., 2012; Fuetsch and Suess-Reyes, 2017). The Authors have summarised in Table 1, the most important behavioural insights of the family business:

Table 1. Main drivers regarding behavioural insights of the family business

Causes	Behavioural insights of the family businesses	Characteristics	Innovation measurement
Internal Factors; Psychological factors	Organizational management structure	Business Roles definition	Experience of the family members reflected into innovation process
	Define needs of the family business		Clear targets for development investment
	Risky decisions	Risk-aversion	Long-term consumption for analysis before innovation
	Strategy development	Short term targets versus long term targets	
	Internal conflicts between family members	Expertise of each member involved	New ideas versus old ideas regarding innovation
	Mistakes and failures in development	Family business meeting evaluation	Responsibility for innovation
	Family tradition, values, culture transfer from generations	Each family business is unique	Innovative behaviour
	Family members expertise	Practice	Clear objectives for innovation
External Factors; Social Factors	Reputation of the company	Stakeholders perception	Successful innovation through quality and efficiency
	Economic situation of the company	Evaluation of the yearly the market capitalization of the company	Financial power for R&D investments
	Dynamic environment	Evaluation of the business niche	Frequency of the innovation process
	Competition analysis	Evaluation	Good practice model

Source: Authors

2.1. Family behavioural insights regarding decisions innovation process

2.1.1. The interconnection between family culture and innovation process

Due to their conservative approach and their traditions in having long-term company strategy, family businesses analyse the external or the internal factors that urge them to invest in innovation. Family businesses are very cautious in keeping their traditions, pattern and their business succession to the next generation, (Chen and Hsu, 2009; Munari et al., 2010; Gómez-Mejía et al., 2014; Patel and Chrisman, 2014). Mostly, they involve well-known researchers in the innovation process who depict their personalized innovative needs, such as Universities, scientists, reputable research and design companies. Doing so, family businesses are aware about the consistent financial efforts' involvement. Despite this, they are keen to preserve resources even for the next generation. Their pattern and emotional connection to the past can hamper innovation, (Broekaert et al., 2016). However, surrounded by all external and/or internal factors, the family business faces one very difficult obstacle: taking risky decisions regarding future innovation, (Kammerlander and Ganter, 2015). This could affect not only a current negative balance sheet, but also the future assets threatening future existence of the family business. Of interest, it does not mean that the family businesses are less innovative than other companies, but their innovative boosters behaviour dictated by the influence of family business brings advantages, on their long-term strategy. There are also disadvantages related to less risk-taking organizations, when it comes about new partnerships for new developments, (Grundstroem et al., 2012; Calabro et al., 2018; Duran et al., 2016). However, family businesses do not prefer internal partner's involvement with the risk to affect family values and emotions, but employ external parties, such as Universities, real well-known experts who will never be in the position to threaten the family business values. Under threatening factors, studies have revealed (Llach and Nordquist, 2010; Frank et al., 2019; Bergfeld and Weber, 2011) that family businesses are afraid of losing company' control and the innovation feeling becomes much more expressed. Nevertheless, when it comes to the interconnection between long term family business strategy and risk avoidance, the behaviour results are translated into a sensible and cautious innovation, focused more on exploitative innovation, (Shane and Venkataraman, 2000; Cassia et al., 2011; Gómez-Mejía et al., 2014; Nieto et al., 2015).

Hypothesis 1: There is a positive association relation between family business culture and innovation process

2.2. Open conflicts within family businesses can create blockage in innovation process

The older and larger the family business is, the more mixed generations exist in the company. There are many cases when conflicts occur between family members, involved in management positions, because of old vs. new business ideas. These

factors can represent a threaten to their business reputation, survival or profits and result from the impact conflict between different family members', translated by the non-acceptance of the management roles within the company or non-acceptance of family's decisions. In the need of innovation, it could happen that unexperienced family members hold strategic management positions, instead of specialists qualified for this need. However, the involvement and the common view and perspective of the experienced family members in the business have the role to strengthen the innovation process, (Cassia et al., 2011; Chirico and Salvato, 2016). The results of these conflicts have an influence over the management innovation, dictated by the informal family members, instead of employing outside experts. The innovation process takes place but in a weak manner. The studies worldwide indicated other internal family conflicts; examples regarding the difference between family business internal organizations as compared to other companies from the same industry or having the same age, such as Canadian companies driven by hairs who had a less active behaviour, (Morck et al., 2000). Or Tanewski et al. (2003) showed on Australian market that the family businesses are less innovative, but are having a greater innovative strategy, which pushes them to be leaders in their fields. Another European study lunched in 11 countries pointed out the human role and internal key factors for successful families businesses in terms of innovation, (Llach and Nordqvist, 2010) or the Italian one with reference to the technological innovation as compared with strategy innovation in family businesses, (Giacosa et al., 2016). Family businesses have the right to set up their own research and design set of tools, by acquiring external knowledge. In this way, the ability to change is put it into practice, from an internal innovation model to external innovation, (Alaenge et al. 1998; Teece, 1980; Kraus et al., 2012). Undoubtedly, management innovation could refer to the product development innovation, present more in the organizations with Research and Design departments. If the innovative product does not have a clear message for the end consumer, then, the wave will affect the organizational family business by producing uncertainty (Sapprasert, 2010). The organizational management innovation involves new management structures, managerial innovative systems, and much more capacity to innovate. The difference between internal choices approach causes family businesses better define and understand their internal social, cultural and political innovative processes, (Birkinshaw et al. 2008; Wengel et al. (2000). The family member's conflicts lead to the recognition by the family of external sources of innovation, both, in front of employees, if management innovation creates uncertain effects, and for the family itself, by a lawfulness implementation in their business organizational management. A considerable key factor represents the role of the family business new generation, which is keener when it comes to innovation, being risk taking, than the second one, which is more focused on prevention and risk avoidance. The studies have indicated the weakness of the 2nd generation behaviour in innovation but at the same time recommend the creation of additional business to the main family business pillar (PWC Succession Study, 2019).

Hypothesis 2: Open conflicts and innovation process could be a negative association relation between family members

2.3. Family involvement determine successful innovative results

The family influence and control over the business represent a key factor for the innovation decisions. In terms of innovation, the literature cannot generally present that some family businesses are much more competitive than others, but as a key start driver it is highlighted that, each family is unique and has its own values. In addition, for a successful innovative result, it is ideally for the family business to be involved in both organizational and management innovation. (Goel and Jones, 2016). The degree of the family member's involvement, as well as their common capacity and expertise will positively affect innovative decision, with a good financial performance result (Hiebl, 2015; Veider and Matzler, 2016). Alberti and Pizzurno, (2013) referred to family business as performing a gradual innovation, because of their continuous exploration and exploitation of organizational activities, an idea supported also by Nieto et al., (2015). Another key factor of family business success represents the innovation perceived as an "invisible" process (Zellweger and Sieger, 2012) due to the continuous improvement of the innovation process. The advantages for the family business are shown in terms of cost efficiency, (Classen et al., 2014), but not when it comes to radical innovative change. By analysing the relationship between innovation and key performance indicators, family business can benefit from corporate strategy translated through the family brand, which consecrates them over years. (Duran et al., 2016; Kraiczy and Hack, 2017).

Hypothesis 3: Between family members involvement and innovation process is a positive association relation

3. Research Questions/Aims of the research

The Authors have drawn up the main question of the Research around business innovative behaviour of the family business:

Which are the family company's key drivers regarding the business innovation?

The Aim of the research is to analyse the family key drivers behind the innovation decisions. In terms of innovation, many key factors have been analysed, showing the differences between family business and non-family business, with more or less innovative management or the level of contribution of the shares' owner over the business, but definitely, these were not the key drivers for a particular innovative behaviour of a family company. (Fuetsch, 2018). Other qualitative researches (Callabro et al., 2018) suggested as an example the innovative "best practice / good practice", adopted by family business, described as the first learning rule in terms of successful long-term innovative behaviour. Expansion of the knowledge over the "rules of the successful innovative game" with the role of contribution to the Literature, are present in both, theoretical and practical models (Frank et al., 2019).

The Authors have summarised the family business behavioural insights in Table 1. Main drivers regarding behavioural insights of the family business.

4. Research Methods

4.1. Empirical study on the family business behavioural insights

The Authors have drafted a detailed questionnaire on the internal and external family behavioural insights correspondent with Table 1, "Main Drivers regarding behavioural insights of the family business". The questionnaire was sent to a sample of 50 companies, at the level of Europe, with 25%-50% shares ownership, with 45 years+ experience on the market, meaning after the 1st generation, medium to large companies, where the family/members of the family are involved in the business and where the family business innovate for their core business.

The questionnaire was addressed to the family companies coming from 4 different industries with the target to show the differences in family key drivers regarding innovative business behaviour. The following industries where the family companies come from are: (1) Consumer industry (2) Serial production industry (3) Real Estate/Construction (4) Farming industry. Out of 50 family companies, only 42 confirmed participation to the questionnaire. The research period was November 2018 – September 2019. The persons involved in the research had a detailed understanding about the family company, the research has been addressed mainly to the owners or family members involved in the business daily running and helped to emphasize the behavioural innovative role of the family business. The analysis had also some limitations related to the financial crisis, which could have brought a pause into the dynamic innovative action of the family business in the last couple of years or a strong financial recovery, affecting the financial health of the family business. Also, another limitation addressed the low no. of industries limited to four, but which involve different family behaviour insights. The Authors present the Questionnaire of the research study in Table 2.

Table 2. Questionnaire to the Analysis of the family behavioural insights

1. From which industry your company makes part?
2. On a scale from 1-5 what is your company position in your national market share?
3. On a scale from 1-5 does your company innovate based on a culture, traditions from the past?
4. Does your company innovate due to the dynamic industry where it belongs?
5. Is the Family involved in the daily business?
6. How many members of the family are involved in the business roles?
7. On a scale from 1-5 does your company have a long-term strategy for 10 years+?
8. On a scale to 1-5 does your company have a short-term strategy for 5 years?

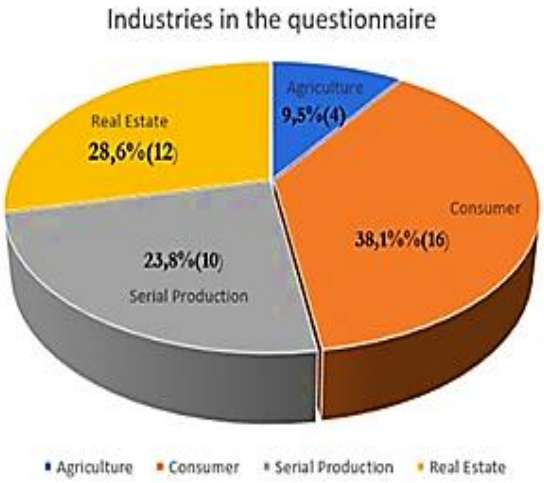
9. Does your company have an internal R&D department?
10. Are the family members involved in R&D decisions?
11. On a scale from 1-5 are your young family members involved in the innovation process?
12. On a scale from 1-5 is there a yearly neutral evaluation of the family members involved in the business roles?
13. On a scale from 1-5 are there the family members on the right business position within the company according to their expertise?
14. On a scale from 1-5 are there any conflicts between the owners and young family members when it comes to innovation ideas?
15. Please indicate what is the conflict reason?
16. On a scale from 1-5 are the family open conflicts a blockage delaying/ stopping the innovation process?
17. Please select the average no. of days consumed for solving the conflicts? 7 days / 14 days/ more than 14 days
18. What is the family % ownership over the shares?
19. On a scale from 1-5 does the company make yearly reserves for future innovation?
20. On a scale from 1 to 5 what is the % of the annual turnover reinvested in R&D?
21. Does your company collaborate with external R&D?
22. On a scale from 1-5 how often does your company innovate at every 3 years?
23. On a scale from 1-5 how important is innovation for your company?
24. How many times per month innovation meetings take place?
25. On a scale from 1 to 5 how fast the decision regarding innovation is to be taken?
26. On a scale from 1-5 does your company analyse the "lessons learned" after wrong decisions regarding innovation process?
27. On a scale from 1-5 does your company measure innovation regarding efficiency of the innovative process?
28. On a scale from 1 to 5 does your company learn from other similar companies, from the same business niche. (good practice model)?
29. On a scale from 1-5 how much did your company suffer in the period 2008-2012?

Source: Authors

4.2. Findings of the Questionnaire:

From the sent-out questionnaire, 84%, 42 companies from the family companies have answered with the following splitting: 38% family companies from consumer industry, 23.3% from serial production, 28% from Real Estate and 9.5% from Agriculture, as shown in Figure 1.

Figure 1. Industries types in the Questionnaire

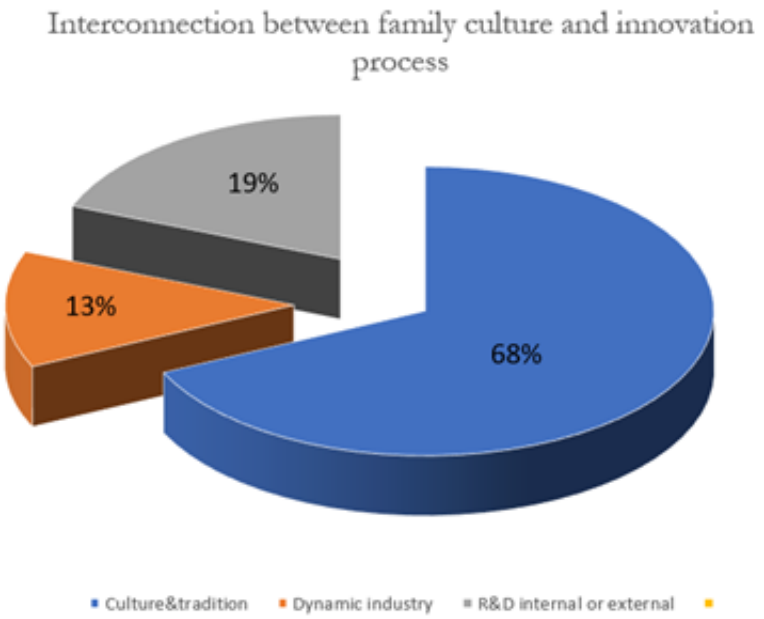


Source: The Authors

Hypothesis 1: There is a positive association relation between family business culture (for the innovative companies) and innovation process

68% from the answers of the family business admitted that their company culture and traditions are key drivers for innovation as shown in Figure 2). 13% of the answers indicated that keeping up with competition is mainly given by the dynamic environment of the industry, where the family business activates. The rest of 19% of the answers indicated a high importance of the internal R&D as well as the external collaboration with Experts who ensure continuous innovative activities. Regarding the four industries analysed, 76% of the family businesses coming from consumer industries and 45% from the ones coming from serial production ranked a high level of importance regarding innovation process, because as compared to Real Estate and Agriculture industries, the consumer and serial production imply much more processes in terms of innovative products for Consumer industries and cost efficiency valid for serial production. Based on the statistical results, the Authors demonstrated hypothesis 1.

Figure 2. Interconnection between family culture and innovation process

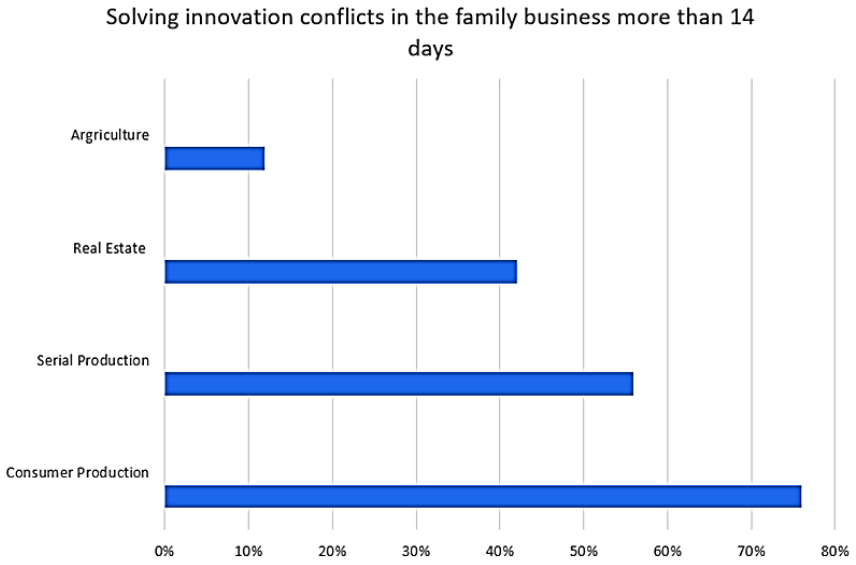


Source: The Authors

Hypothesis 2: Open conflicts and innovation process could be a negative association relation between family members

The answers of the family businesses indicate a high importance for the innovation process regarding the solving of conflicts within 14 days or more as shown in Figure 3) 76% from the consumer industry answered that they solve conflicts in more than 14 days, which means there is a blockage of the continuous innovation process. Agriculture is a sector without too much competition rate, still, judging by the collected answers, the main reason for possible open conflicts (88%) confessed by the farming family business are the agricultural machines purchases. Serial production turned out to have a rate of 56%, namely more than 14 days to solve conflicts within the family. Real estate sector indicated a percentage of 42 in terms of the term longer than 14 days for solving the conflicts. The authors conclude that hypothesis 2 is demonstrated, based on the high percentages calculated regarding the negative impact on the long time until open conflicts are to be solved and the innovation process deblocked.

Figure 3. Solving innovation conflicts in the family business in more than 14 days

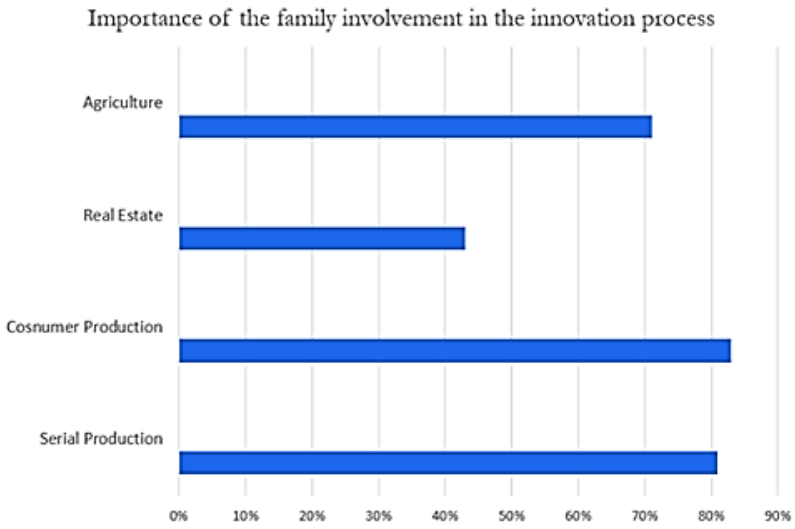


Source: The Authors

Hypothesis 3: There is a positive association relation between family involvement and innovation process

The Authors found out that a successful innovation and the family involvement are the key factors behind family business. This was interpreted by the Authors in the collected answers, especially in the consumer and serial production industry which answered in a percentage of more than 80% that they considered family involvement as the most important factor for positive innovation process. In the Real Estate business, the relation between family involvement and innovation is less important because innovation is limited; still the rate calculated is 43 %, while in agriculture business the involvement of the family was rated at a very high level, 92%, as shown in Figure no 4. With these results, the Authors demonstrated hypothesis 3.

Figure 4. Importance of the family involvement for the innovation process



Source: The Authors

5. Conclusions

Family businesses are driven by the following social and psychological factors: by the fear of losing the business, or due to family traditions acting continuously for innovation or the innovative ways in keeping the brand name, by corporate strategy, or by the involvement of the family members in business management. Even though financial efforts are considered, family businesses call often-external experts regarding R&D for innovation (universities, experts, designers). Preservation of good quality produced and offered on the market will always be existing in the family business members thinking. Depending on the industry they come from, innovation of their internal processes can bring a better efficiency and cost savings at the level of the company. Through a successful corporate strategy itself, the family business is continuously innovating. The family values, traditions and patterns are part of their corporate strategy, which for a family business segment it imposes continuous products development. Secondly, the survival of the family business in their industries could not be possible without a psychological understanding of the industry requirements and continuous product development.

References

[1] Alaenge, S., Jacobsson, S., Jarnehammar, A. (1998). Some aspects of an analytical framework for studying the diffusion of organizational innovations, *Technol Anal Strateg Manag*, 10(1), pp. 3-20.

[2] Alberti, F. G. and Pizzurno, E. (2013). Technology, innovation and performance in family firms, *International Journal of Entrepreneurship & Innovation Management*, 17(1), pp. 142-161.

[3] Astrachan, J., Shanker, M. (2003). "Family Businesses" contribution to the US economy: a closer look", *Family Bus Rev*, 16(3), pp. 211-219.

[4] Beck, S., and Kenning, P. (2015). The influence of retailers' family firm image on new product acceptance: an empirical investigation in the German FMCG market, *International Journal of Retail & Distribution Management*, 43(12), pp. 1126-1143.

[5] Bergfeld, M.-M., Weber, F., M. (2011). Dynasties of innovation: highly performing German family firms and the owners' role for innovation. *Int J Entrep Innov Manag*, 13(1), pp. 80-94.

[6] Birkinshaw, J., Hamel, G., Mol, M. J. (2008). Management innovation. *Acad Manag J*, 33(4), pp. 825-845.

[7] Block, J. H. (2012). R&D investments in family and founder firms: an agency perspective, *Journal of Business Venturing*, 27(2), pp. 248-265.

[8] Broekaert, W., Andries, P., and Debackere, K. (2016). Innovation processes in family firms: the Relevance of organizational flexibility, *Small Business Economics*, 47(3), pp. 771-785.

[9] Calabrò, A., Vecchiarini, M., Gast, J., Campopiano, G., De Massis, A., and Kraus, S. (2018). Innovation in family firms: a systematic literature review and guidance for future research, *International Journal of Management Reviews*, available at: *http://* doi.org/10.1111/ijmr.12192.

[10] Carney, M. (2005). Corporate governance and competitive advantage in family-controlled firms, *Entrep Theory Pract*, 29(3), pp. 249-265.

[11] Cassia, L., De Massis, A., Pizzurno, E. (2012). Strategic innovation and new product development in family firms: An empirically grounded theoretical framework, *International Journal of Entrepreneurial Behaviour & Research*, 18(2), pp. 198-232.

[12] Cassia, L., De Massis, A., and Pizzurno, E. (2011). An exploratory investigation of NPD in small family business from Northern Italy, *International Journal of Business, Management and Social Sciences*, 2(2), pp. 1-14.

[13] Chen, H. L., and Hsu, W. T. (2009). Family ownership, board independence, and R&D investment, *Family Business Review*, 22(4), pp. 347-362.

[14] Chirico, F., and Salvato, C. (2016). Knowledge internalization and product development in family firms: when rational and affective factors matter, *Entrepreneurship Theory & Practice*, 40(1), pp. 201-229.

[15] Chrisman, J. J., and Patel, P. C. (2012). Variations in R&D investments of family and nonfamily firms: behavioural agency and myopic loss aversion perspectives, *Academy of Management Journal*, 55(4), pp. 976-997.

[16] Classen, N., Carree, M., Van Gils, A., and Peters, B. (2014). Innovation in family and nonfamily SMEs: an exploratory analysis, *Small Business Economics*, 42(3), pp. 595-609.

[17] Contò, F., Vrontis, D., Fiore, M., Thrassou, A. (2014). Strengthening regional identities and culture through wine industry cross border collaboration, *British Food Journal*, 116(11), pp. 1788-1807.

[18] De Massis, A., and Kotlar, J. (2014). The case study method in family business research: guidelines for qualitative scholarship, *Journal of Family Business Strategy*, 5(1), pp. 15-29.

[19] Duran, P., Kammerlander, N., Van Essen, M., and Zellweger, T. (2016). Doing more with less: innovation input and output in family firms, *Academy of Management Journal*, 59(4), pp. 1224-1264.

[20] Economist (2009). European family firms in the recession, *Dynasty and durability*, September 26, p. 75.

[21] Eddleston, K. A., Kellermanns, F. W., and Sarathy, R. (2008). Resource configuration in family firms: linking resources, strategic planning and technological opportunities to performance, *Journal of Management Studies*, 45(1), pp. 26-50.

[22] Giacosa, E., Broccardo, L., Truant, E. (2016). A comparative study of the innovation strategies of family and non-family firms in Italy, *Impresa Progetto, Electronic Journal of Management*, 3.

[23] Feranita, F., Kotlar, J., and De Massis, A. (2017). Collaborative innovation in family firms: past research, current debates and agenda for future research, *Journal of Family Business Strategy*, 8(3), pp. 137-156.

[24] Frank, H., Kessler, A., Bachner, C., Fuetsch, E., Reyes-Suess, J. (2019). Principles for innovation management in family firm. An analysis of long-term successful good practices with a practitioner validation of the principles. *Journal of Family Business Management Emerald Publishing Limited*, 2043-6238 DOI 10.1108/JFBM-09-2018-0049.

[25] Fuetsch, E. (2018). Fall 4: Entrepreneurship im Familienweingut: Innovation und Wandel als zentrale Strategiebestandteile, In Altenburger, R., Frank, H. and Kessler, A. (Eds), *Innovation in Familienunternehmen*. *Good Practice - Fallanalysen aus Niederösterreich,* Facultas, Vienna, pp. 125-156.

[26] Fuetsch, E., and Suess-Reyes, J. (2017). Research on innovation in family businesses: are we building an ivory tower, *Journal of Family Business Management*, 7(1), pp. 44-92.

[27] Glover, J. L., and Reay, T. (2015). Sustaining the family business with minimal financial rewards. How do family farms continue*?*, *Family Business Review*, 28(2), pp. 163-177.

[28] Goel, S. and Jones, R. J. III (2016). Entrepreneurial exploration and exploitation in family business: a systematic review and future directions, *Family Business Review*, 29(1), pp. 94-120.

[29] Gómez-Mejía, L. R., Campbell, J. T., Martin, G., Hoskisson, R. E., Makri, M., and Sirmon, D. G. (2014). Socioemotional wealth as a mixed gamble: revisiting family firm R & D investments with the behavioural agency model, *Entrepreneurship Theory and Practice*, 38(6), pp. 1351-1374. JFBM.

[30] Grundström, C., Öberg, C., and Öhrwall Rönnbäck, A. (2012). Family-owned manufacturing SMEs and innovativeness: a comparison between within-family

successions and external takeovers, *Journal of Family Business Strategy*, 3(3), pp. 162-173.

[31] Gudmundson, D., Tower, C. B., and Hartman, E. A. (2003). Innovation in small businesses: culture and ownership structure do matter, *Journal of Developmental Entrepreneurship*, 8(1), pp. 1-17.

[32] Habbershon, T. G., Williams, M., MacMillan, I. (2003). A Unified systems perspective of family firm Performance. *J Bus Ventur*, 18(4), pp. 451-465.

[33] Hatak, I., Kautonen, T., Fink, M., and Kansikas, J. (2016). Innovativeness and family-firm performance: the moderating effect of family commitment, *Technological Forecasting and Social Change*, 102, January, pp. 120-131.

[34] Hiebl, M. R. (2015). Family involvement and organizational ambidexterity in later-generation family businesses: a framework for further investigation, *Management Decision*, 53(5), pp. 1061-1082.

[35] Kammerlander, N., and Ganter, M. (2015). An attention-based view of family firm adaptation to continuous technological change: exploring the role of family CEOs' noneconomic goals, *Journal of Product Innovation Management*, 32(3), pp. 361-383.

[36] Kellermanns, F. W., Eddleston, K. A., Barnett, T., and Pearson, A. (2008). An exploratory study of family member characteristics and involvement: effects on entrepreneurial behaviour in the family firm, *Family Business Review*, 21(1), pp. 1-14.

[37] King, N., Anderson, N. (2002). *Managing innovation and change – a critical guide for organizations, 2end*, Thomson, London.

[38] Kraiczy, N. (2013). *Innovations in Small and Medium-Sized Family Firms. An Analysis of Innovation- Related Top Management Team Behaviours and Family Firm Specific Characteristics*, Springer Gabler, Wiesbaden.

[39] Kraiczy, N., and Hack, A. (2017). Innovation and family business research: a review, In Kellermanns, F. W. and Hoy, F. (Eds), *The Routledge Companion to Family Business*, Routledge, New York, NY, pp. 211-240.

[40] Kraus, S., Pohjola, M., Koponen, A. (2012). Innovation in family firms: an empirical analysis linking organizational and managerial innovation to corporate success, *Review of Managerial Science*, 6(3), pp. 265-286.

[41] Lamla, J. (1995). *Prozeßbenchmarking dargestellt an Unternehmen der Antriebstechnik*, Vahlen, Munich.

[42] Lee, J. (2006). Family firm performance: further evidence, *Family Business Review*, 19(2), pp. 103-114.

[43] Lee, M., and Rogoff, E. (1996). Research note: comparison of small businesses with family participation versus small businesses without family participation: an investigation of differences in goals, attitudes, and family/business conflict, *Family Business Review*, 9(4), pp.423-437.

[44] Leenen, S. (2005). *Innovation in family businesses–a conceptual framework with case studies of industrial family firms in the German "Mittelstand"*, St. Gallen, HSG.

[45] Lindow, C. M. (2013). A strategic fit perspective on Family Firm Performance, DOI 10.1007/ 978-3-8349-7167-8, *Springer Fachmedien Wiesbaden 2013 Research*, Leipzig, Germany.

[46] Llach, J., Nordquist, M. (2010). Innovation in family and non-family businesses: a resource perspective, *Journal Entrepreneurial Venturing*, 2(3/4), pp. 381-399.

[47] Llach, J., Marquès, P., Bikfalvi, A., Simon, A., and Kraus, S. (2012). The innovativeness of family firms through the economic cycle, *Journal of Family Business Management*, 2(2), pp. 96-109.

[48] Lubatkin, M. H., Ling, Y., Schulze, WS. (2007). An organizational justice-based view of self-control and agency costs in family firms, *Journal Management Studies*, 44(6), pp. 955-971.

[49] Mandl, I. (2008). Overview of family business relevant issues. Final Report, project on behalf of the European Commission, Vienna, *Austrian Institute for SME Research*.

[50] Matzler, K., Veider, V., Hautz, J., and Stadler, C. (2015). The impact of family ownership, management, and governance on innovation, *Journal of Product Innovation Management*, 32(3), pp. 319-333.

[51] Miller, D., Friesen, P. H., (1983). Innovation in conservative and entrepreneurial firms: two models of strategic Momentum, *Strateg Manag J*, 3(1), pp. 1-25.

[52] Morck, R., Strangeland, D. A., Yeung, B. (2000). Inherited wealth, corporate control, and economic growth: the Canadian disease. In: Morck R (ed) *Concentrated corporate ownership. University of Chicago Press, Chicago*, pp. 319-369.

[53] Morris, M. H. (1998). Entrepreneurial intensity. Quorum, Westport

[54] Munari, F., Oriani, R., and Sobrero, M. (2010). The effects of owner identity and external governance systems on R & D investments: a study of Western European firms, *Research Policy*, 39(8), pp. 1093-1104.

[55] Naldi, L., Nordqvist, M., Sjöberg, K., and Wiklund, J. (2007). Entrepreneurial orientation, risk taking, and performance in family firms, *Family Business Review*, 20(1), pp. 33-47.

[56] Nieto, M. J., Santamaria, L., and Fernandez, Z. (2015). Understanding the innovation behavior of family firms, *Journal of Small Business Management*, 53(2), pp. 382-399.

[57] Patel, P. C., and Chrisman, J. J. (2014). Risk abatement as a strategy for R&D investments in family firms, *Strategic Management Journal*, 35(4), pp. 617-627.

[58] PWC report about succession (2019). https://www.pwc.ro/en/press-room/press-releases-2019/pwc-report--entrepreneurs-in-romania-are-the-most-advanced-in-th.html (accessed, September 2019).

[59] Roed, I. (2016). Disentangling the family firm's innovation process: a systematic review, *Journal of Family Business Strategy*, 7(3), pp. 185-201.

[60] Romano, C., Tanewski, G., and Smyrnios, K.X. (2000). Capital structure decision making a model for family business, *Family Business Review*, 16(1), pp. 285-310.

[61] Sapprasert, K. (2010). Determinants and effects of organizational innovation. In Sapprasert, K. (ed.) *Exploring Innovation in Firms: Heterogeneity, technological and organisational innovation, and firm performance*. Oslo: University of Oslo (Ph.D. dissertation).

[62] Schaper, M., Volery, T. (2004). *Entrepreneurship and small business: a Pacific Rim perspective.* Wiley, Milton.

[63] Shane, S., and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research, *Academy of Management Review*, 25(1), pp. 217-226.

[64] Simon, H. (2009). *Hidden Champions of the Twenty-First Century: The Success Strategies of Unknown World Market Leaders*, Springer, New York, NY.

[65] Suess-Reyes, J., and Roed, I. (2018). Innovationen in Familienunternehmen: Lernen von 'Good Practices', In Altenburger, R., Frank, H. and Kessler, A. (Eds), Innovation in Familienunternehmen. *Good Practice-Fallanalysen aus Niederoesterreich*, Facultas, Vienna, pp. 10-29.

[66] Tanewski, G. A., Prajogo, D., and Sohal, A. (2003). Strategic orientation and innovation performance between family and non-family firms, *Presented at the World Conference of the International Council of Small Business, Monash University.*

[67] Teece, D. J. (1980). The diffusion of an administrative innovation, *Manage Sci*, 26(5), pp. 464-470.

[68] Veider, V., and Matzler, K. (2016). The ability and willingness of family-controlled firms to arrive at organizational ambidexterity, *Journal of Family Business Strategy*, 7(2), pp. 105-116.

[69] Wengel, J., Lay, G., Nylund, A., Bager-Sjo¨gren, L., Stoneman, P., Bellini, N., Bonaccorsi, A., Shapira, P. (2000). Analysis of Empirical Surveys on Organisational Innovation and Lessons for Future Community Innovation Surveys, *Scientific Follow-up of the Community Innovation Survey (CIS) Project CIS 98/191*. European Commission, Brussels.

[70] Wolf, J., and Rosenberg, T. (2012). How individual scholars can reduce the rigor-relevance gap in Management research, *Business Research*, 5(2), pp. 178-196.

[71] Zahra, S. A. (2003). International expansion of U.S. manufacturing family businesses: the effect of ownership and involvement, *Journal of Business Venturing*, 18(5), pp. 495-512.

[72] Zellweger, T. (2018). Managing the Family Business: Theory and Practice, *Edward Elgar Publishing*, Cheltenham/Northampton, MA.

[73] Zellweger, T. (2017). Managing the Family Business, Theory and Practice, *Edward Elgar Publishing*, Cheltenham, UK, Northampton, MA, USA.

[74] Zellweger, T. M., and Sieger, P. (2012). Entrepreneurial orientation in long-lived family firms, *Small Business Economics*, 38(1), pp. 67-84.

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Developing a New Model for Monitoring and Evaluating Public Services Performance

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Abstract

Public service is a matter of public interest, not only for the public administration, but also for the beneficiaries. People are increasingly interested in the quality of the public service and have become more and more demanding. The amount of information that is available on the internet creates higher expectations. In this context, using measurement and reporting methods and instruments is not optional anymore. Furthermore, the provision of public services is a matter of achieving a balance between costs, pleasing the beneficiary, increasing quality and benchmarking with similar services. Since Romania has become a member of the EU, and even earlier, since it has been a beneficiary of development funds, the issue has not been just the provision of public services, but that of using and creating measurement instruments and methods, and the question of achieving the performance point where a balance between costs and benefits is attained. The problem is that there is a lack of understanding the basics of reporting results and monitoring performance, there is no general instrument or model that allows any public institution to use it and benchmark the results, and the instruments available are either too complicated to understand or do not work for the entire range of public service. Thus, the present study aims at offering a general measurement instrument for the public service performance.

Keywords: public services, monitoring and reporting models, evaluation of public services.

JEL Classification: H79

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1. Introduction

The problem of performance in public administration and in public services is bivalent. Firstly, there is little understanding of the terms (public service, performance, monitoring and reporting instruments) and the utility of this process (monitoring and evaluating the performance of a public service). Secondly, there is no or in the best-case scenario little experience with the public service performance. Even when monitorization and evaluation of performance as a process is used, as a tool for better public administration, it rarely considers more than economical and some technical aspects of the public service provider`s performance. The following study brings a new model for monitoring and evaluating the performance of a public service through some universal criteria that are found in all public services.

2. Problem Statement

The issue of monitoring and evaluating the performance of public services of general interest is not new and has generated complex solutions relevant for this purpose in recent years.

The use of public service performance reporting platforms has paved the way for the operationalization of transparency and accountability of public authorities in the performance/provision of these services. Benchmarking allows the measurement and comparison of performance in order to provide information to public decision makers and to permanently improve performance. Performance indicators are the basis for comparing the overall performance of a specific organization or services. This is a technique that has been increasingly incorporated into the new public management, which has dominated the modernization activities of the public sector since the 1990s. Performance measurement and comparisons have been introduced as a quasi-competition in the public sector to stimulate innovation and lead to better performance of the services offered (European Comission, 2013).

In the OECD countries, starting with 2017, "The Serving Citizens Scorecards" is used for characterising the key aspects of public service systems in the member countries from the perspective of their accessibility, quality and sensitivity (access, quality and responsiveness). The indicators were established by OECD experts for each service area: health care, education and justice. The selected indicators aim to provide an overview of the issues relevant to each sector (OECD, 2019).

The focus on public utilities is the objective of the present research, since currently they are not distinctly subject to integrated performance reporting. Ensuring the development of quality services of general interest, accessible and bearable, in an environment that is constantly evolving and imposing new demands, is mandatory in order to evaluate the way in which public services are provided. In this respect, it is necessary in the context of this research, to make a clear delimitation of the concept of organizational performance of the public service provider from the concept of performance of the public service performed/ provided. The organizational performance of public service providers is a complex multidimensional construct (Markic, 2014). It is a concept that can be approached

from multiple points of view and on different levels of analysis. In fact, defining and explaining the content of the performance concept depends on the purpose and interests pursued in analysing it. The specialized literature is vast and very innovative in explaining the concept, although it is very heterogeneous in terms of finding a consensus in defining it. A study conducted by Summermatter & Siegel presents, from the perspective of analysing the specialized literature, a vast investigation on how to explain this concept (Summermatter & Siegel).

While for the organizational performance there are multiple possibilities of definition, measurement and monitoring, the question arises to what extent is this relevant to the performance of the public services provided. In essence, the organizational performance level of the provider is represented by the synergy between efficiency-effectiveness-economy, a sine-qua-non condition of the performance of the service provided. However, how can the performance of a public service be characterized? In essence, the performance of a public service must aim to ensure the well-being and increase the quality of life of its beneficiaries. A logical and obvious way of explaining the concept starts from the definition, purpose and finality of the public service.

The European Parliament defines a public service of general interest as an economic activity of general interest defined, created and controlled by public authorities and subject to a special legal regime, regardless of whether it is actually carried out by a public or private body. Based on this definition, the three fundamental principles of public services are outlined:

1. equality or universality: the service must be available to all under the same conditions;
2. continuity: the service must be provided continuously and regularly (the obligation to provide);
3. adaptation: the service must be modified as needs change and, ultimately, it is no longer needed.

According to the Romanian legislation (Law 51/2006), public utilities must meet the following essential requirements: a) universality; b) qualitative and quantitative continuity, under contractual conditions; c) adaptability to user requirements and long-term management; d) equal and non-discriminatory accessibility to the public service, under contractual conditions; e) transparency and user protection. In economic terms, the concept of SGEI is closely linked to that of "public service obligations". The public service obligations mainly involve the provision of universal service, continuity and supportability of the service, as well as measures to protect the beneficiary. Simultaneously or not, two requirements must be met through public service obligations: universal coverage and uniform price. Universal coverage implies the obligation to provide the product or service at an "affordable price", while uniform prices oblige the operator to offer a certain product or service at the same price to all consumers, regardless of the variation in the supply costs for different groups (EACGP Sub-Group on State Aid, 2006).

The requirement of universality is an ideal wish, it implies the access of all citizens and businesses to accessible and high quality services of interest. From the

EU perspective, it is an essential principle for promoting social and territorial cohesion in the European Union and for reducing the obstacles caused by the lack of accessibility in the outermost regions (European Commision, 2004). In this context, we propose the definition of the universality requirement through accessibility and the quality of the service.

3. Research Questions/Aims of the research

1. How can performance of the public services of general interest be evaluated, beyond the performance of the operator/provider?
2. Can performance indicators that correspond to the essential requirements that the public services of general interest must meet be identified?
3. Can a model for quantifying the integrated performance of services of general interest that will allow the evaluation and monitoring of this performance be developed?

By taking into account the main characteristics of a public service, the following model responds to the above posed questions by creating composite indicators grouped into such main characteristics of every public service.

4. Research Methods

Through a rigorous analysis of the existing literature, considering the main models for monitorisation and evaluation of public services performance in use today and the main existing indicators that can be used within such a model, by including them in several performance criteria, the following chapter proposes a new performance monitorization and evaluation model.

5. Findings

Starting from the main essential characteristics of public services discussed above, the presented model creates the premises for monitoring and evaluating the performance of public services in a unitary approach. This model will allow the decision factor that uses it to monitor and evaluate the performance obtained by a certain operator but can also make comparative analyzes with providers of the same service at the level of synthetic indicators and with providers of other types of services through composite indicators. The common characteristics based on which this model is built are:

- Qualitative and quantitative continuity, under contractual conditions;
- Adaptability to user requirements and long-term management;
- Equal and non-discriminatory accessibility to the public service, under contractual conditions;
- Transparency and user protection.

Synthetic indicators, regardless of their nature and the composite indicators they form (one of the characteristics of the services provided above), must acquire an adimenesional form, defined as the level of performance that can be used later in

constructing the composite indicator that defines the performance on a certain criterion. Thus, the physical indicator, expressed in: hours, km, kg, completed reports, degree of digitization, etc., must be transformed into a level of performance. For doing so, we define three methods for establishing the registered level of performance within the model.

1. Comparison of the indicator with a minimum target level and a maximum target level set by the decision maker or a national or local target and segmentation of the interval between the two values on a performance scale.
2. If more operators are introduced into the model, the obtained indicators can be compared with the sector average.
3. Creating a performance scale based on the interval between the minimum and the maximum admitted at European level or the minimum and maximum obtained based on European comparative analyzes.

As an example for the 3rd variant of establishing the level of performance for a specific indicator we use the following two accesibility indicator for public transport:

A study of the EU commision on 39 cities obtained the following minimum and maximum limits for two very important indicators (table 1):

Table 1. Minimum and maximum values obtained in 39 analyzed cities by the EU commision for 2 accesability indicators of public transport.

	Large urban centers (>= 500.000 inh.)		*Medium-sized urban centers (200.000-500.000)*	
	Min	Max	Min	Max
Population without acces to services (%)	1.4	23.8	1.1	28.7
Median number of departures	7.4	33.1	4.0	34.8

Source: (European Comission -DG regional and Urban Policy), 2016)

The above presented limits may be used in determining a performance scale for the 2 indicators.

Although the synthetic indicators at the service level may differ, for each criterion separately, their significance remains unchanged, as for each service they define a certain level of performance for one of the 4 criteria. Their aggregation in the form of a single composite indicator for each criterion will allow for bechmarking analyses from the point of view of the performance obtained for each public service, regardless of its nature. One way to compose the composite indicators proposed as being generally accepted in the development of indicators for public services in the specialized literature is to use a weighted average of the underlying indicators that compose the composite indicator in the following form (Pidd, 2012):

$$P = w_1 * x_1 + w_2 * x_2 + w_3 * x_3 + \ldots + w_n * x_n \text{ , where:} \quad (1)$$

- P = the overall performance obtained for the respective criterion (eg quality, adaptability, continuity, etc.);
- x1, x2 ... xn = specific indicators that fall within this criterion;
- w1, w2 ... wn = the weight applied to each specific indicator according to its importance in generalizing the level of performance obtained for that criterion.

The main aspect to be followed in using this way of quantifying the general indicators that define the performance is the importance given by the users or the designers of the model of the subindicators that define the composite indicator.

Based on the reasoning above, for all the services that will be monitored, performance levels can be obtained for each of the essential characteristics of a service. These values, obtained for each criterion are comparable, by their nature but may be irrelevant, in many situations due to the different specificities of the services. For example, if we obtain a certain value of the general indicator "Service continuity" for the "public water supply service" and a similar value for the "local public transport service", it can be concluded that in terms of continuity the two services recorded approximately the same level of performance. The problem that arises in this reasoning is that due to the technical nature of the water supply service, it is possible that, in certain areas, the continuity of the service may not be physically able to record a level of performance as high as that of a public school transport service, which has completely other technical constraints.

To solve the aspect above, we can also use for the composite indicators that define the performance at criterion level within the model the overall performance obtained by a service, as each of the 4 criteria can be compared with a minimum level or a target level established for each criterion, for each sector of activity. Thus, in order to ensure a relevant comparability between the performance obtained by different non-homogeneous public services from the point of view of their activity, the positive or negative deviation will be compared with the minimum or target level established for each service.

For both specific and composite indicators, when using the average value of performance on public service types, the model used increases in relevance as more service providers upload data into the system and use it for monitoring and evaluating the obtained performance.

In this context, we propose the following table containing a set of performance indicators, for example, for two services of public utilities, different in terms of characteristics: the service of thermal energy supply in a centralized system and the public transport service of travelers, which can be used for developing such a model.

Table 2. Proposed performance indicators for two public utility services in the presented model

Essential requirements / Proposed indicators	Centralized district heating	Urban public transport
Continuity from the qualitative and quantitative point of view.	Number of users affected by scheduled and unscheduled interruptions (%)	Cancelled or irregular routes due to the operator's fault (%)
	The average duration of an interruption (h)	Routes cancelled for a period longer than 24 hours due to the operator's fault; (%)
		The number of passengers affected by the situations provided for in points 1 and 2. (No. of citizens)
		The daily degree of compliance with the transport program (%)
Adaptability to user requirements and long-term management	Greenhouse Gas Emissions	Greenhouse Gas Emissions
	Energy losses (%)	Km of public transport system per 100.000 population
	Demand Price Elasticity (Self Elasticity)**.**	Penalties for non-compliance with environmental and quality conditions
Equal and non-discriminatory accessibility to the public service, under contractual conditions	Affordability	Number of annual PT trips per capita total annual number of transport trips divided by the total city population (trips/cap/year)
	Number of beneficiaries in total population in the area served (%)	Access to Public Transport Number of inhabitants with a transportation stop within 500 m/total population (%)
Transparency and user protection	Number of claims or amount of damages paid regarding the non-compliance by the supplier of the contractual clauses	Number of PT stops with real time info (%)
	Access to information (Linkert scale)	Access to information (Linkert scale)
		Number of traffic accidents caused by the fault of the own personnel or of the transport operator / authorized carrier number of cases at mil.veh.km.
Quality of service	Share of the number of complaints regarding the quality of the thermal energy in the total number of users. Number of complaints / Total number of users (%)	The weight of the number of complaints regarding the quality of the service in the total number of users. Number of complaints / Total number of users (%)
	Thermic comfort (Likert scale)	The traveller satisfaction index

Source: authors

6. Conclusions

The main advantages of using such a model is that it allows the user to have a comprehensive image of the performance of a service operator that considers more than just an operator focused performance. Another advantage of the model is that by creating performance levels for each criterion (main public service characteristics) benchmarking can be used between various services which are heterogeneous in nature.

References

[1] EACGP Sub-Group on State Aid. (2006). *Services of General Economic Interest, Opinion Prepared by the State Aid Group of EAGCP*. Retrieved from https://ec.europa.eu/competition/state_aid/studies_reports/sgei.pdf.

[2] European Comission. (2013). *Powering European Public Sector Innovation: Towards A New Architecture, Report of the Expert Group on Public Sector Innovation.* Retrieved from https://ec.europa.eu/research/innovation-union/pdf/psi_eg.pdf.

[3] European Comission − DG regional and Urban Policy. (2016). *Towards harmonised indicators on acces to urban public transport in europe.*

[4] European Commision. (2004). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions −White Paper on services of general interest.* Retrieved from // https://eur-lex.euro.

[5] Markic, D. (2014). *A Review on the Use of Performance Indicators in the Public Sector*. 3(1), 22-28. Retrieved from ://bib.irb.hr/datoteka/689608.TemJournalFebruary2014_22_28.pdf.

[6] OECD (2019). *Government at a Glance 2019, OECD Publishing, Paris, https://doi.org/10.1787/8ccf5c38-en.).* Paris: OECD Publishing. Retrieved from https://doi.org/10.1787/8ccf5c38-en.).

[7] Pidd, M. (2012). *Measuring the Performance of Public Services − Principles and Practice.* New York: Cambridge University Press.

[8] Summermatter, L., & Siegel, J. P. (n.d.). Defining Performance in Public Management: Variations over time and space. Retrieved from https://www.alexandria.unisg.ch/53071/1/Defining%20Performance_IRSPM.pdf.

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Factors and Barriers of Lean Implementation A Delphi Model Development in the Freight Transportation Sector

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Abstract

Lean management assessment and readiness starts with developing a gap analysis between the factors and barriers that create or impede successful lean implementation. The article presents the main factors and barriers that sustain or prevent the lean process implementation in the freight transportation industry. In regard to the freight transportation sector, seven criteria of assessment were taken into consideration for developing a Delphi model of consultation of the experts. The lean implementation criteria refer to: cost/benefit, employees training and growth, effective leadership, financial capabilities, technical factors, organizational culture and synchronization between lean goals and actual practices. The results of Kendall's coefficient analysis reveal with high level of consensus between experts that VSM, JIT, TQM, TPM, TMS and RFID implementation depends mostly on the organizational culture of transportation companies based on innovation, clear strategies of senior management, easy access to financial resources and simulations for effective measurement. Based on experts' consultation, the study concludes that the lack of research and development activities, top management resilience to change, poor tools of performance measurement and lack of integrated strategies constitute the essential barriers of lean application in the freight transportation sector.

Keywords: lean implementation, factors, barriers, freight transportation sector, VSM, JIT, TQM, TPM, TMS and RFID.

JEL Classifications: M110

1. Introduction

The lean paradigm was first mentioned in the scientific literature by Krafcick (1988) and has constantly evolved in the last 40 years, encompassing a broader set of principles and practices, being spread globally across many industries and fields of activity. The follow-up publications of Womack et al. (1990) capture the differentiation process between the TPS (Toyota Production System) model and

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the new lean paradigm incorporating practices such as Kanban, JIT (just-in time) production and delivery, TQM (total quality management), quality circle or cross-functional teams. The new "lean production" incorporates principles, practices and techniques developed by the Japanese automotive companies in the past century. (Emiliani, 2006; Sone, 2012) The superiority of the new lean management is reflected in terms of high productivity, increased processes velocity, quality and flexibility. (Schonberger, 2007) In addition, other researchers agree on the idea of multiple practices combinations in lean management, with the difference of a more holistic approach. Successful lean implementation assumes perfect supplier alignment and integration, and lean is talking about creating long-term partnerships with suppliers who share the same philosophy and practices of value creation and continuous improvement (Dyer and Hatch, 2006; Manfredsson et al. 2019; Shah and Ward, 2007). Despite of the positive results of lean thinking application especially in the manufacturing sector, many publications highlight issues and failures in lean implementation related to employee's stress and human resources management. An extended literature provides evidence of challenges when it comes to combining lean techniques into a coherent, integrated management system. A large number of articles pinpoint resistance factors and barriers in successful lean implementations in reference of workforce training and labour issues. (Stone, 2012) Hence, setbacks of lean implementation were explained by means of a poor understanding of the employee empowerment principle or lack of training management system. Bhasin and Burcher (2006) underline some certain issues related to lean application, explaining the poor rate of lean implementation within companies. There are other opinions that depict more resistance to change when it comes to innovative manufacturing improvements and less flexibility to adapt in particular situations (shut-downs, accidents, machine burned-out). In his research, Mousa (2013) underlines some inefficiency in JIT deliveries that quite often may cause employees' dissatisfaction, delays or freight claims due to shortages. The research of Chan et al. (2019) underlines the importance of leadership strategies and communication quality in lean application.

Using the field force analysis as the primary research method and also the fuzzy logic method, Baskaran and Lakshmanan (2019) have represented mathematically in their study a plethora of factors and barriers in lean manufacturing. Previous studies confirm the results, the emphasis on successful lean implementation relying mostly on management commitment, empowered workforce, and technological support. As far as the barriers concern, resource constraints, investment restrictions and exterior factors (fluctuations in demand) are amongst the preventing factors of lean application. Proper lean management application contributes to continuous improvement, process optimization and waste minimization, creating more balance between efficiency and resilience in unpredictable situations. (Păunescu and Argatu, 2020) The present research presents the specific of the transportation sector in regard to the most influential factors/barriers in lean practices implementation.

The purpose of the present paper is to identify the factors and barriers that influence the extent to which lean implementation in the freight transportation sector proves its effectiveness.

Therefore, the article is structured as followed: introduction, literature review revealing the previous findings of researchers with regard to determining factors or barriers in lean practices deployment, methodology description, presenting the Delphi model development, research results and conclusions.

2. Problem statement

2.1. Lean practices application in the context of digitization and globalization of the freight transportation processes

Operations management literature provides the most important lean manufacturing practices that usually lead to superior operations and financial performance. (Olsen, 2004) However, the literature proves its scarcity in regard to certain practices adopted in the freight transportation sector. The traditional manufacturing lean practices, namely JIT, TQM and TPM (total preventive maintenance) know an extensive and enlarged area of effectiveness when are backed-up by practices related to the digitization trends. The adoption of the new TMS (transportation management system) or RFID (radio frequency identification) systems support and sustain transportation lean objectives of zero waste, continuous improvement, high velocity of the transportation fulfilment and consistent visibility. (Popescu, 2020, June).

The achievement of transportation leanness implies factors consideration such as time, cost, flexibility and visibility. In the light of lean practices application, an integrative freight transportation business model assumes reduced transportation cycle time, decreased shipping/receiving time, minimized idle time; in terms of cost, an increased employee effectiveness within the warehouse management processes, no paperwork inaccuracies and product rejected, avoided traffic jams with no fuel waste; in terms of visibility, no product shortages, re-routing the drivers in a timely manner avoiding delays and fines, increased safety avoiding fleet shut-downs and accidents; and not the least flexibility in terms of innovation, ability to adapt to changes, proper workforce training and management involvement in the decision making process. The greatest ability required in a sustainable lean paradigm is to acquire and retain customers through visibility and effective communication (Păunescu, Popescu and Duennweber, 2018).

2.2. Factors and barriers influencing lean adoption within freight transportation companies

Literature review and lot of studies dedicated to lean manufacturing and freight transportation underline the importance of joint lean practices application. Operational and financial performance in freight transportation is positively

influenced by the extent to which joint implementation of VSM (visual stream map), JIT, TQM, TMS and RFID is fulfilled (Popescu, 2020, June).

However, there are many companies that register failures in lean management application, even though only few of them make statements and reports in the matter. According to Salonitis and Tsinopoulos (2016), the frequent causes of unsuccessful lean application directly connects with the quality of leadership, the level of employees' training and involvement and the business strategies in lean practices adoption. The study also implies that poor resource allocation and resistance to change can constitute negative factors affecting the lean implementation process. In fact, top management can be a supporting factor of lean application in case of positive initiatives, long term lean objectives and clear strategies or, on the contrary, a delaying determinant. Other research findings justify the employees' or management resilience to change due to the fears of possible job loss, of lack of necessary skills that might end in unemployment or not seeing the necessity of change management process.

Deal and Kennedy (1988) emphasize on organizational culture as an important factor in lean management decision and application. The study reveals that corporate culture based on organizational readiness, research and development activities through experts' consultation and employment, effective resource allocation to support the new systems introduced and teamwork, is the key element in successful lean application. However, there are situations in which lean practices adoption fails due to poor lean training, insufficient focus on the customers' needs or communication issues between departments.

The general opinion of scholars depicted from literature state that small and medium companies don't always understand the principles of lean philosophy (decreasing the inventory level, supplier reduction and integration, JIT delivery) or that there is no concordance between them and their partners.

In a recent research of Jadhav et al. (2014) in regard to JIT implementation, twelve barriers that might negatively affect successful lean practices implementation were presented. The authors underline that lack of management commitment, poor training and education and financial constraints gained the highest ranking. Other barriers refer to organizational cultural differences, poor strategies and communication employees' resistance in regard to multiple tasks assignment and fear of unemployment, poor facility layout and lack of consistent working methods. However, in large organizations innovation and new technologies are easily adopted, due to resource availability (Kaynak, 1996).

Generally, the digitized systems of RFID and TMS require a change management process visualized as a continuous adaptation of employees' tasks and assignments, new schedules and responsibilities which infer new organizational culture based on innovation and flexibility as key determinants of successful implementation. Lack of simulations, performance measurement instruments and poor monitoring and control systems create the conditions for lean practice application failure. There were also reported situations in which, companies returned to the old traditional practices when setbacks were encountered (Su, 1994).

It is mandatory for freight transportation companies to carry out a business impact analysis that refers to preventive measures taking into consideration possible situations of transportation disruptions created by the new lean practices introduced. The study of Păunescu, Popescu and Blid (2018) reveals the significant correlation between technology, data communication and business impact analysis.

The freight transportation sector is affected by numerous delays, long hours of shipping and receiving and poor commodity visibility when there is no JIT practice alignment and synchronization between the carrier and the shipper or there is no use of TMS system capable to better monitor the drivers and the freight. Poor information sharing results in the increase of the transportation lead time, more situations with paperwork inaccuracies and disruptions in the whole freight transportation process. (Popescu, 2020, June)

3. Research Questions

After a consistent study of scientific literature in regard to factors and barriers in lean practices implementation the following statements were formulated:

P1: There are certain factors such as *senior management commitment* and *organizational culture* based *on innovation* that positively influence the lean process application in the freight transportation industry.

P2: There are several barriers such as *top management resilience to change* and *poor measurement tools of performance* that prevent successful lean implementation in the freight transportation industry.

4. Research Methods

Literature review provides articles and research studies that confirm situations of failure in lean implementation, especially amongst manufacturing companies. One of the present research objectives is to identify the factors/barriers that facilitate/hinder successful lean application in the freight transportation industry. With this regard, the Delphi panel of experts' consultation was deployed, all the persons interviewed being involved in the lean implementation process providing their experience and opinions.

The experts' purpose consultation was to identify for each lean practice what are the factors and barriers that contribute or prevent the implementation process. The factors and barriers in the aforementioned practices application involve seven criteria of assessment: cost/benefit (Robinson, 2018), employees' training and growth, effective leadership (Worley and Doolen, 2006), financial capabilities (Bhasin, 2008), technical factors and organizational culture (Jedynak, 2015) divided also in subsets of 42 (statements) questions.

4.1. Panel of experts' selection

The researcher have selected a database of 8 experts, from which one of them has experience in oversized load dispatching, one proved expertise in multi modal transportation with large applicability of lean practices, two proved also their

expertise in logistics and Supply Management integration methods, an expert in freight brokerage, one expert in lean transportation operations and integration of digitized tools into the traditional methods, and practitioners from the transportation industry, specialized in lean practices adoption, risks and cost/benefits of implementation. The panel includes also 1 scholar, professor and author in the field of VSM, TQM, JIT and TPM implementation. All eight people willing to participate in the panel have proved their expertise in lean performance application and lean factors or barriers in lean adoption. Due to a high level of consensus obtained in the first round the second one wasn't necessary. The experts agreed to participate in the panel in March 2020 and the data processing was completed in May 2020.

The participants were asked to support each statement in a certain degree using also the Likert scale from 1 to 5 from which: 1. totally disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. totally agree. The compelling results were obtained through data processing in SPSS program by analysing the Kendall's coefficient of consensus.

4.2. Criteria of analysis in Delphi model application

The factors and barriers in freight lean implementation have been evaluated using seven criteria, namely, cost/ benefit (1), employees training and growth (2), effective leadership (3), financial capabilities (4), technical factors (5), organizational culture (6) and synchronization between lean goals and actual practices (7). Each subset of factors or barriers were coded using numerical and literal items denoting as follows:

1. Cost/ benefit criteria

In identifying the factors of lean practices application, in terms of cost/ benefits criteria 5 factors and 5 barriers were identified. The factors facilitating lean implementation refer to *technical support*, *specialized companies in counselling support*, *management commitment*, *resource management* and *employees' management*. Barriers preventing lean application infer *high implementation costs*, *security issues*, *administration costs*, *low return on investment* and *employees' resilience to change* as cost, time consuming.

2. Employees training and growth

Regarding the employees training and growth, two factors and two barriers were identified: *multifunctional teams* and *employee empowerment* as facilitators and *high consuming time of training* and *resilience to change* as barriers in lean application.

3. Effective leadership

The effective leadership criteria analysis includes three factors namely *vertical communication between departments, cross-functional teams, decentralized leadership* and as far as barriers concern, the most cited factors in literature refer to *poor quality control of implementation*, *poor abilities in finding the right*

measurements of performance, and *lack in research and development activities* within company.

4. Financial capabilities

As financial criteria concern, the following statements were depicted as important in lean practices deployment: *unbalanced resource allocation* as a barrier and *easy access to resources* as a factor of opening the pace to lean.

5. Technological criteria

The technical criteria include three factors and three barriers in lean application. The factors that facilitate lean deployment refer to *technological changes made in steps*, *experimental teams* and *simulations for measuring the effectiveness* before lean tools implementation. As part of the barriers, the need for substantial changes are imposed sometimes in different lean tools, usually *time-consuming* causing along the way disruptions in process implementation that might produce poor transportation operation.

6. Organizational culture

Organizational culture criteria include five factors and three major barriers in lean implementation. The new context of globalization invites companies to create their business *model based on innovation* as the main factor in gaining competitive advantage and also for customer satisfaction. (Ahmad et al. 2004) Companies based on principles of *market share pursuit* and extended operations are more open to lean innovation. The strategies and consensus through innovation technologies deployment constitute part of the organizational culture definition. The barriers in lean innovation due to the framework of the organizational culture refer to *high distance from authority* and high *management resilience to change* (Fullerton and Wempe, 2009).

7. Synchronization

An important aspect related to successful lean practices implementation arises in regard to *synchronizing moments* of different lean practices within the same company or with their partners. According to Ahmad et al. 2007 and Wakchaure et al. 2014 operational and financial performance must be ensured with the simultaneous implementation of JIT, TQM and TPM. In order to decrease the shipping/ receiving time and to improve communication and also to avoid paperwork mistakes, RFID and TMS, the digitized tools must be implemented in a strategic bundle. Different stages of lean practices deployment between stakeholders can create *disruptions*, preventing the vertical integration objective to be achieved.

Each tool practice analysed will be coded according to each sub-criterion, using the criterion code as follows: TMSF1a- TMS application depending on 1a factor; TMSB1a- TMS application depending on the 1.a barrier).

5. Research findings

The Delphi model has reached high level of consensus (Kendall's coefficient over the value of .600, high level of significance, .000<.05, chi square over the value of 100) with regard to factors and barriers of lean implementation in transportation. Table 1 summarizes the results of experts' opinions, concluding high level of agreement concerning organizational culture, synchronization of the processes with the partners, effective leadership and financial criteria as important factors in lean implementation in the freight transportation industry.

Table 1. The results of Delphi model concerning the factors of lean application

Factors	**VSM/Kendall coefficient-.698/sig. 0<.05/chi square 128.5**	**JIT/Kendall coefficient- .703/sig. 0<.05/chi square 129.3**	**TQM/Kendall coefficient-.782/sig.0<.05/ chi square 143.9**	**TPM/Kendall coefficient-.767/sig. 0<.05/chi square 149.1**	**TMS/Kendall coefficient-.806/sig.0<.05, chi square 122.5**	**RFID/Kendall coefficient-.891/ sig.0<.05, chi square 106.3**
1.Competitive advantage gained through innovation	Mean rank-20.63	Mean rank-19.38	Mean rank-19.56	Mean rank-20.38	Mean rank-13.75	
2.Senior management based on clear strategies	Mean rank-18.44	Mean rank-19.38	Mean rank-19.56	Mean rank-20.38		
3.Focusing on customer satisfaction		Mean rank-19.38	Mean rank-19.56	Mean rank-20.38		
4.Easy access to financial resources					100% consensus	Mean rank-17.13
5.Simulations for effectiveness measurement					100% consensus	Mean rank-17.13
6.Technological changes made in steps				100% consensus	100% consensus	Mean rank-17.13
7.Good technical support						Mean rank-15.88
8.Vertical communication between departments					100% consensus	

Source: by author's own research

According to the results, the main factor of lean application refers to the organizational culture of a company based on competitive advantage gained through innovation and focus on customer satisfaction. The innovation process strictly correlates with continuous learning and companies aligned to those

types of organizational culture more inclined to develop innovative ideas (Sehested and Sonnenberg, 2011).

The idea of innovation infers business vision and a clear lean roadmap. It involves senior management based on clear strategies in consensus of lean implementation, according to the customer requirements and market demand. The results confirm previous research studies of Kaynak (1996) and Solaimani et al. (2019).

Other important factors that sustain lean implementation in the freight transportation sector include good technical support, easy access to financial resources, technological changes made in steps and simulations for effectiveness measurement (Minh et al. 2015ș Zhu et al. 1994).

With regard to barriers, Table 2 shows that lean practices application can register certain rate of failure due to gaps in *effective leadership*, *financial restraints* and *technological issues.* In the moment of lean deployment, the management must have a set of *clear tools of performance measurement* in order to properly quantify the benefits of lean practices application (Easwaramoorthi et al. 2011; Netland, 2016). *Top management resilience to change* may constitute a factor of lean failure. The top management is required to have a long-term strategy for lean adoption, facilitating the change management process through a proper allocation of material and human resources (Chan et al. 2019).

Table 2. The results of Delphi model concerning the barriers in lean implementation

Barriers	**VSM/ Kendall coefficient-.616/ sig.0/ chi square 78.8**	**JIT/ Kendall coefficient-.705, sig. 0/ chi square 95.9**	**TQM/ Kendall coefficient-.754/ sig.0/ chi square 102.4**	**TPM/ Kendall coefficient-.739/ sig.0/chi square 100.5**	**TMS/ Kendall coefficient-.782/ sig. 0/chi square 106.3**	**RFID/ Kendall coefficient-.759/ sig.0/ chi square 103.2**
1. Effective leadership	Mean rank-15.88					
2. Lack of research and development activities	Mean rank-15	Mean rank-16			100% consensus	Mean rank-13.94
3. Lack of integrated business strategy	Mean rank-15		Mean rank-15.53	Mean rank-15.94	Mean rank-14.56	
4. Poor measurement tools of performance		Mean rank-17.06	Mean rank-16.88	Mean rank-15.44	100% consensus	Mean rank-13.94
5. High level of time consuming		Mean rank-15.53	100% consensus	Mean rank-13.69		Mean rank-13.94
6. Top management resilience to change		Mean rank-16.31	Mean rank-15.50		Mean rank-11.63	
7. Unballanced resource allocation						Mean rank-13.94

Source: by author's own research

The new innovative lean practices application can create disruptions in the freight transportation process; therefore, simulations and proper implementation are the necessary actions to be taken. Unbalanced resource allocation to new innovative practices can create disruptions and may affect the dynamic of the transportation activities (Netland, 2016).

Conclusions

The lean transportation business model based on innovation emphasizes on *organizational culture committed to innovation*, on the importance of defining clear strategies and consensus amongst top management, proper resource allocation and simulation prior implementation, continuous training and learning and not the least strong alliances for network development and integration. Therefore, Statement 1 proved its validity. *Top management resilience to change*, *poor measurement tools of performance* and *technological issues* constitute the main barriers in lean deployment in transportation. Therefore, S2 also proves its validity.

Limitations: The factors and barriers drafted do not include other factors concerning demand fluctuations, the external economic context and other political or governmental regulations that may affect lean implementation and deployment.

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References

[1] Achanga, P., Shehab, E., Roy, R., & Nelder, G. (2006). Critical success factors for lean implementation within SMEs. *Journal of Manufacturing Technology Management*, 17(4), pp. 460-471.

[2] Ahmad, A., Mehra, S., & Pletcher, M. (2004). The perceived impact of JIT implementation on firms' financial growth performance. *Journal of Manufacturing Technology Management*, 15(2), pp. 118-130.

[3] Baskaran, S. M., Lakshmanan, A. R. (2019). A framework for lean readiness evaluation using a hierarchical fuzzy system. *South African Journal of Industrial Engineering*, 30(1).

[4] Bhasin, S. (2008). Lean and performance measurement. *Journal of Manufacturing Technology*, 19(5), pp. 56-72.

[5] Bhasin, S., & Burcher, P. (2006). Lean viewed as a philosophy. *Journal of Manufacturing Technology Management*, 17(1), pp. 56-72.

[6] Chan, S. W., Ismail, F., Ahmad, M. F., Zaman, I., & Lim, H. Q. (2019). Factors and barriers influencing Lean Production System adoption in manufacturing industries. *International Journal of Supply Chain Management*, 8(2), pp. 939-946.

[7] Dyer, J. H., and Hatch, N. W. (2006). Relation-specific capabilities and barriers to knowledge transfers: creating advantage through network relationships. *Strategic Management Journal*, 27(8), pp. 701-719.

[8] Deal, T., & Kennedy, A. (1988). *Corporate cultures*. Penguin, London.

[9] Easwaramoorthi, M., Kathiresan, G. R., Prasad, P. S. S., & Mohanram, P. V. (2011). A survey on lean practices in Indian machine tool industries. *International Journal of Advanced Manufacturing Technology*, 52(9-12), pp. 1091-1101.

[10] Emiliani, M. L. (2006). Origins of lean management in America - the role of Connecticut businesses. *Journal of Management History*, 12(2), pp. 167-184.

[11] Fullerton, R. R., & Wempe, W. F. (2009). Lean manufacturing, non-financial performance Measures and financial performance. *International Journal of Operations & Production Management*, 29(3), pp. 214-240.

[12] Jadhav, J. R., Mantha, S. S., & Rane, S. B. (2014). Analysis of interactions among the barriers to Jit production: interpretive structural modelling approach. *International Journal of Lean Six Sigma*, 11, pp. 331-352.

[13] Jedynak, P. (2015). Lean management implementation: Determinant factors and experience. *Jagiellonian Journal of Management*, 1(1), pp. 51-64.

[14] Kaynak, H. (1996). *The relationship between Just-in-time purchasing and total quality management and their effects on the performance of firms operating in the US: An empirical investigation*. Doctoral thesis associated with University of North Texas, Denton.

[15] Krafcick, J. F. (1988). Triumph of the lean production system. *Sloan Management Review*, 30, pp. 41-52.

[16] Manfredsson, P., Hilletofth, P., & Reitsma, E. (2019). Involving suppliers in a lean training Program. *the 9th International Conference on Operations and Supply Chain Management*.

[17] Minh, N. D., Nguyen, N. D., & Tuan, L. A. (2015). Framework of critical success factors for lean implementation in Vietnam manufacturing enterprises, *VNU Journal of Science: Economics and Business*, 31(5E), pp. 33-41.

[18] Mousa, A. (2013). Lean, SixSigma and Lean SixSigma overview. *International Journal of Scientific & Engineering Research*, 4(5).

[19] Netland, T. H. (2016). Critical success factors for implementing lean production: The effect of contingencies. *International Journal of Production Research*, 54(8), pp. 2433-2448.

[20] Olsen, E. O. (2004). *Lean manufacturing management: the relationship between practice and firm level financial performance*. Doctoral thesis associated with the Ohio State University.

[21] Păunescu, C., & Argatu, R. (2020). Critical functions in ensuring effective business continuity management. Evidence from Romanian companies. *Journal of Business Economics and Management*, 21(2), pp. 497-520.

[22] Păunescu, C., Popescu, M. C., & Duennweber, M. (2018). Factors determining desirability of entrepreneurship in Romania. *Sustainability*, 10(11), pp. 11-22.

[23] Păunescu, C., Popescu, M. C., & Blid, L. (2018). Business impact analysis for business continuity: Evidence from Romanian enterprises on critical functions. *Management & Marketing Challenges for the Knowledge Society*, 13(3), pp. 1035-1050.

[24] Popescu, M. C. (2020). The most innovative lean practices deployed in transportation and their effects on the financial and operational performance. *The 14th International Conference on Business Excellence*, Bucharest, Romania.

[25] Robinson, A. (2018). *5 Best Transportation Management Optimization Practices Utilizing Strategic Freight Shipping*. Extracted from https://cerasis.com/transportation-management-optimization/.

[26] Salonitis, K., & Tsinopoulos, C. (2016). Drivers and barriers of lean implementation in the Greek Manufacturing sector. *The 49th CIRP Conference of Manufacturing Systems*, 57, pp. 189-194.

[27] Schonberger, R. J. (2007). Japanese production management: An evolution-with mixed success. *Journal of Operations Management*, 25, pp. 403-419.

[28] Sehested, C., & Sonnenberg, H. (2011). *Lean innovation, a fast path from knowledge to value.* Springer-Verlag, Berlin, Germany.

[29] Shah, R., & Ward, P. T. (2007). Defining and developing measures of lean production. *Journal of Operations Management*, 25, pp. 785-805.

[30] Solaimani, S., Haghighi, A., & Van der Rhee, B. (2019). An integrative view on Lean innovation management. *Journal of Business Research*, 105, pp. 109-120.

[31] Stone, K. B. (2012). Four decades of lean: a systematic literature review. *Journal of Lean Six Sigma*, 3(2), pp. 112-132.

[32] Su, K. D. (1994). How a leading heavy industries Co., Ltd. In Korea implements JIT philosophy to its operations. *Computing Industrial Engineering*, 27(1-4), pp. 113-136.

[33] Wakchaure, V. D., Nandurkar, K. N., & Kallurkar, S. P. (2014, June). Relationship between implementation of TQM, JIT, TPM and SCM and manufacturing performance: empirical evidences from Indian context. *International Manufacturing Science and Engineering Conference*, Detroit, Michigan, USA.

[34] Womack, J., Jones, D., & Roos, D. (1990). *The Machine that Change the World*, Rawson Associates, New York, NY.

[35] Worley, J. M., & Doolen, T. L. (2006). The role of communication and management support n lean manufacturing implementation. *Management decision*, 44(2), pp. 228-245.

[36] Zhu, Z., Meredith, P. H., & Makboonprasith, S. (1994). Defining critical elements in JIT implementation: A survey. *Industrial Management Data System*, 94(5), pp. 3-10.

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Get Tokenized... The Specificity of Personal Tokens in the Context of Tokenization and Axiological Categorization

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Abstract

One of the types of services offered by fintech is tokenization, with personal tokenization being a special category – arousing a reflection on the values to which it refers. The purpose of the study is to define the specificity of personal tokens as one of token types and to present the axiological context to which personal tokens refer. Two research questions were formulated: (1) What is it that distinguishes personal tokens from other types of tokens?, (2) What values did the users of the personal token platform refer to when creating their own token? In order to better understand the functioning of personal tokens as an innovative and competitive solution with regard to traditional financial services, data from the first personal token platform (personaltokens.io) in Poland were analysed – the project's objectives, investment, execution form and value system were reconstructed. A case study was used as a qualitative test method; the data under analysis was collected from the personaltoken.io platform. The test methods used are data analysis and humanistic interpretation based on an explanatory procedure used in humanities, enabling the reconstruction of the axiological context behind human driving factors. Particular criteria have been selected to determine the specificity of personal tokens from other types of tokens. Research findings lead to the following conclusions: (1) there are two ways of personalisation: individual and community; (2) users assume two types of recipient/purchaser of the personal token – "mine" and "foreign"; (3) two spheres of emphasis can be distinguished – the private and professional ones.

Keywords: personal tokens, fintech, values, axiology.

JEL Classification: G10, Z13

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1. Introduction

Tokens are no new thing. In the real world, they are used as substitute for money, e.g. in casinos or lotteries. In the virtual world, tokens are mainly used in computer games. Tokens as financial innovations, called cryptoassets, that emerged alongside the blockchain technology[3] (or the more broadly applied concept of "distributed ledger technology" – DLT). At present, numerous analyses are being carried out into the ever emerging new types of digital tokens and the process of tokenization as the procedure for their creation (or issuance) in the context of the application scope, safety and the regulatory function. Attempts to define and categorise tokens have been made, among other institutions, by ECB, BIS, ESMA, OECD.

One of the less known types of digital tokens is the so-called personal token. At present, we are lacking in a sufficient amount of analyses of this solution which brings together financial, technological and philosophical (ethical) issues. Personal tokens rely on the already existing (and currently intensified) processes of service and product personalization applied in marketing, trade and banking.

Partially, personal tokens also fit within the concept of private money, possibly being its further development stage. All in all, they are part of the so called decentralized finance (DeFi).

The purpose of the study is to define the specificity of personal tokens as one of token types and to present the axiological context to which the personal tokens refer.

2. Literature Review

Basically, digital tokens are a financial category, currently classified as cryptoassets. They are the next stage of the development of this category of instruments initiated by the cryptocurrency Bitcoin created by S. Nakamoto in 2009. In his articles, the creator of Bitcoin repeatedly stresses that the major problem of conventional currencies is trust which safeguards the smooth functioning of the contemporary system (Nakamoto, 2009). However, the author does not challenge the existing solutions directly. He agrees that the system is well suited for most transactions with its major weakness being only the adopted model of trust (Nakamoto, 2008). In practice, the launch of Bitcoin paved the way for the development of the blockchain technology, too.

In a certain opposition to S. Nakamoto is G. Selgin, the author of "Money Free and Unfree" (2017), who also coined the concept of "synthetic commodity money" to describe a new type of money with the properties of both commodity (absolutely

[3] Blockchain is a distributed register in the peer-to-peer network, made up of nodes, which is recorded identically in a number of places at the same time. Anyone can have an insight into it. The register allows recording transactions in blocks which are connected with each other by means of cryptographic methods. Blocks create a chronological chain of transactions. The safety of the blockchain technology is safeguarded by the irreversibility of transactions and impossibility of changing transaction history.

rare) and money (store of value). However, this type of money is not the same as cryptocurrencies, and trading in it does not have to rely on the blockchain technology (Selgin, 2015).

Based on the development of cryptocurrencies, a social movement and the concept of the so-called decentralized finance (DeFi) emerged. DeFi is, at its core, as its name suggests: infrastructure, markets, technology, methods and applications enabling decentralized provision of financial services. Frequently, such systems are based on the distributed ledger technology as the basis for token-based ecosystems, in many cases extending even beyond the realm of finance (Zetzsche, Arner, Buckley, 2020). DeFi is also the realization of the broader concept of the distributed democratic economy and the implementation of the essence of the sharing economy.

In the broader context, personal tokens fit into the discussion on trust in money and the broadly construed democratization of finance. In a narrower sense, the issues of axiological dimensions of tokens are mainly brought up in the context of the ethical considerations on fintech and cryptocurrencies. In particular, it is about risk assessment and the moral dilemmas concerning risk (Lynn, 2019; Dembinski 2017, Lapointe i Fishbane, 2018, Dierksmeier & Seele, 2016). Most discussions are on the value of trust (DeBriun, 2015; Ghosh, 2008).

Authors also postulate the universalization of normative standards aimed at determining either the moral ideals of business players (Kucz, 2019) or the normative theory of cryptocurrencies and blockchains (Coeckelbergh & Reijers, 2016). The axiological dimension of the functioning of cryptocurrencies and tokens as if "built" upon them is also taken into account in relation to the ethically doubtful (social justice) polarization of societies into those taking advantage of digitization and those failing to do so due to the "digital divide" (Hughes 2017). However, there are no deeper axiological analyses into particular types of tokens, such as personal tokens.

3. Research Questions

In the article, two research questions are formulated by the authors:

(1) What is it that distinguishes personal tokens from other types of tokens?

(2) What values did the users of the personal token platform refer to when creating their own token?

4. Research Methods

The research takes the form of a case study (qualitative research). The applied research methods are data analysis and humanistic interpretation in accordance with the Poznań Methodology School (an explanatory procedure applied in humanities, enabling the reconstruction of the axiological context of human behaviour).

The broad methodology framework, adopted for the purposes of this article, is determined by a particular cultural perspective, in which culture is recognized as

the mental reality, regulating the behaviour, actions, activities taken by people on the above-individual basis (socially) (Kmita, 1994). This mental reality is made up of two-fold types of beliefs: normative and directivable. The former determine values as the drivers of our actions; thus, values represent the meaning of the activities undertaken – an individual will undertake a specific activity because he or she is convinced that the activity outcome will yield a particular value. Directivable beliefs concern the ways of achieving the normatively determined value. Thus, the values embraced within the cultural context are a kind of beacon for human actions; thus, they are both a creation of people and a regulator of their actions. Under this theory, values are not dealt with in an absolute way – they are historically changeable, they are subject to temporary and situational contexts, they are relativized culturally. This particular research perspective was selected due to its usefulness in the axiological analysis of the actions taken by network users in the process of tokenizing themselves. The reconstruction of the beliefs about personal tokens allows comparing the values (determining the axiological basis) that token issuers refer to. A humanistic interpretation was applied as the explanatory procedure. It consists in constructing such an answer that explains the reason for taking a particular activity (own token issuance). This kind of explanatory procedure depends on the assumption of the rationality of the subject (assuming that the individual acts in a rational way). The humanistic interpretation of data (the reconstructed system / hierarchy of values, as the axiological background behind the actions of the issuers) allowed an axiological categorization of personal tokens.

The humanistic interpretation was applied with regard to the data derived from one of the first (first in Poland) platforms for personal tokenization − www.personaltokens.io. The platform was built in 2017 and its aim is to allow individuals to issue, manage, describe, distribute and trade in their personal tokens, issued through Ethereum under the ERC-20 standard. The number of created tokens is 21 million, divisible to four decimal places. Platform users are verified three times: one mandatory account with MetaMask (linking issuers to Ethereum) and two accounts with social networking websites (either Facebok, LinkedIn or Google). The data under analysis was accessible on the platform between April 1st, 2020 and July 16th, 2020. 443 personal token profiles were studied.

5. Findings

Digital tokens are alternatively called coins (or altcoins). Basically, they are defined as a type of cryptoassets with the very concept of cryptoassets still being debated (Castrén, Kavonius, Rancan, 2020). At present, there is no single legal definition of digital tokens. On the whole, it is universally accepted that digital tokens are within the concept of cryptocurrency; however, depending on functional interpretation, some studies separate them out. Many international institutions are striving to work out best practice in terms of defining digital tokens (BIS 2018; ESMA 2019; OECD 2019, ECB 2019). On that basis, the authors favour the broad

definition under which digital (or virtual) tokens are a digital record of specific rights that can also be a representation of particular assets.

A great range of types of tokens have already been well identified in terms of technology and economy. Of these, the least known kind of tokens is personal tokens. Thus, considering the classification of digital tokens presented below, it is possible to point to several most important features of personal tokens (Table 1).

Table 1. Classification of digital tokens

Criteria	Type of tokens
Type of the creating (issuing) entity	**Institutional tokens** (or corporate tokens, brand tokens)
	Personal token (or individual tokens)
Method of technological link	**Native tokens** (or protocol tokens)
	Non-native tokens (or application tokens, app tokens, platform tokens)
Rights represented	**Exchange-type tokens** (or currency tokens, payment tokens, token-based money)
	Investment-type tokens (or asset tokens, asset-backed tokens, security tokens, equity tokens)
	Utility tokens
Price/value stability	**Stablecoins**
	Non-stable coins
Digital contract standard	**Fungible tokens**
	Non-fungible tokens

* In brackets: alternative names applied to particular token types

Source: own elaboration

Personal tokens are separated out under the subjectivity criterion as they are created at the initiative of private individuals, who they represent, rather than institutional entities (e.g., corporations or banks). Examples of tokens issued by the latter ones are the foretold Libra coin and JP Morgan coin.

Under the manner of technological link criterion, personal tokens are non-native tokens. They are not directly "built" in the distributed ledger but in platforms based on the ledger. In turn, native tokens are an integral part of the distributed ledger (e.g., Blockchain, Ethereum) and allow any type of transfers and transactions. Native tokens can also be defined as cryptocurrencies of the particular distributed ledger. Examples of native tokens include Bitcoin, Ether and Neo.

Under the legal representation criterion, personal tokens have a wide range of application. Their owners (issuers) can declare the exchange of their tokens for various services. In this context, personal tokens preserve their payment function (exchange-type tokens). The issuers of personal tokens can also offer shares and potential profits in specific undertakings. Thus, this type of personal tokens

can also perform the investment function (investment-type tokens). Personal tokens can also act as collateral against obtaining a specific service in the future or be of specifically promotional (marketing) character. Therefore, they can also perform utility functions (utility tokens).

Another criterion, the stability criterion, means that the owner of the token guarantees its credibility and exchange stability over time. Thus, under the assumption that token "stability" means (Samman i Masanto, 2019):

- the possibility of purchasing a similar basket of goods and services from one day to the next;
- being easily redeemable for the corresponding amount of assets to which the stablecoin is pegged;
- being easily predictable with respect to price outputs;
- growing at the rate of local inflation – which means maintaining value in real terms;
- being relative versus the volatility of other currencies,

personal tokens should be regarded as non-stable coins. On the other hand, examples of typical stablecoins include Theter, Dai and BridgeCoin.

Personal tokens are usually of non-homogeneous and unique nature, attributed to them by their owner. In principle, they are not exchangeable for other tokens and they can have different value (denomination). In the light of the above, they are non-fungible tokens. Protocol standards, applied during the issuance of personal tokens on blockchain, include ERC-721 (individual value of each token), ERC-20 (token features limited to, for e.g., its name, abbreviation/acronym, total issuance value, etc.). Examples of fungible tokens include Litecoin and Monero.

The underlying value category, being both the foundation for the platform organization or its structuring and the specificity of personal tokens that can be thus reconstructed, is the Centrality of the Person. Under this concept, developed under the philosophical personalism (here as defined by Emmanual Mounier, 1952) the human person is an ontological and epistemological starting point for any type of human reflection and activity. The value of a person is placed in the focal point of creating personal tokens and forms the basis for all their future characteristics. The centrality of the Person manifests itself in all the afore-distinguished features of personal tokens – it is the Person who issues, creates their token (the ontological dimension), it is the Person who connects to the Ethereum network through setting up an account with MetaMask (thus giving themselves existence, ontological anchorage, in the specific decentralized blockchain network), it is the Person who decides about legal representation (the ontological-epistemological dimension), it is the Person who guarantees the credibility of their token (the cognitive dimension), and it is the Person who attributes their token with uniqueness (the ontological-epistemological dimension).

Furthermore, the axiological categorization of personal tokens, reconstructed on the basis of the platform under study, allows specifying the human person as an autonomous subject. Subjectivity, built upon the awareness of one's own self, allows the Person to refer to the external environment. It is construed as the

connection of the sustainable "me" (the conscious "me" with the dynamic "me" (that is the actions in response to new circumstances, newly discovered needs or values). An analysis of the data obtained from the Info-About-Me platform reveals three ways of how issuers relate themselves to the environment: 1. Cognitive (presenting oneself through profession, education, interests, e.g. KAMIL KOSTRZEWSKI TOKEN [FULOFMO]), 2. emotional (revealing emotional attitude towards new technologies, e.g. ROBERT WESKER TOKEN [RAW]), and 3. psychic, on the phenomenological level (refer to certain life experience), e.g. CZESŁAW SKAWAREK TOKEN [ARTCOIN]). The axiological categorization of personal tokens in terms of subjectivity primarily depends on two classification criteria of digital tokens: 1. the stability criterion – "revealing" one's own self (through publicizing one's profession, feelings, track record) is meant to give credibility to the token, 2. the criterion of digital contract standard – attributing the token with unique features.

The third axiological criterion of personal tokens (distinguished on the basis of platform features) is their reliance on the idea of community. The human existence is an existence within communities governed by relationships. However, platform data analysis reveals that it is not about community in the personal sense[4], but about the community of exchange and usefulness (primarily, in terms of services, but also interactions, markets, know-how, or investments)[5]. Thus, this criterion gives the legal representation criterion a certain colouration. Issuers create a community of exchanging tokens for various services, e.g., business consulting (e.g., PAWEŁ KORZENECKI TOKEN [ROOTCOIN]), projects management (e.g., MARCIN ZAWIEJA TOKEN [ZAW]), photography services (e.g., MARCIN HERNIK TOKEN [MH]), language courses (e.g., KASIA SZCZYGIEŁ TOKEN [MAK]), tennis coaching (ANDRZEJ MISIEK TOKEN [MISCOIN]), road transport (SŁAWEK PANDEL TOKEN [SEDI]), consultancy in health and wellness (ROBERT WESKER TOKEN [RAW]), dog training (MEGHAN JEROLAMAN TOKEN [LAVAPAWS]), artistic activity (e.g., FIVE EIGHT TOKEN [ART.]), construction services (POGOTOWIEBUDOWLANE COM TOKEN [PBC]), painting, cleaning (WITOLD SZUP TOKEN [VHR]), carpentry (MARCIN WNUK TOKEN [MONTI]), physiotherapy (DAWID MATKOWSKI TOKEN [MAT]). The community of profits and shares can be found in the

[4] In personalistic ethics (e.g., at the Christian personalism level), being a person entails offering oneself to others; community means a unity of persons based on individuality (every person is unique, but owing to common solidarity the person's behaviour is at the same time free and moral) rather than individualism (egocentric attitude isolating the person in the atomistically created social reality based on defining social relationships in the form of limiting rights, creating interpersonal tensions).

[5] All these aspects of exchange are enumerated in the five reasons for issuing personal tokens, as accessible on the platform. 1. Personal token may help in representing your value and price your services in a better way, 2. Access to new markets, 3. Interacting with your community/customers/fans in an innovative way, 4. Personal token can allow others to invest in you and to be engaged in your success, 5. Implementing modern global technology to your business model.

description of the following tokens: property tokenization (BARTOSZ GENERT TOKEN [GEN]), barn construction and starting a herd of seventy A2 gene cows ((RADEK GORZKOŚ TOKEN [GOR]). The community of the utility functions of tokens is found in the context of loyalty tokens (e.g., NIKODEM ZEGZDA TOKEN [NZC], KRZYSZTOF BYTNAR TOKEN [BYTCOIN]).

6. Conclusions

Personal tokens are a new and interesting category of tokens both from the financial and philosophical points of view.

Based on a humanistic interpretation and an analysis of empirical data collected on the platform, the following conclusions have been formulated.

Firstly, at the philosophical level, platform users follow two different ways of personalization: individual and community. Individual personalization means the "turn inside", i.e. accentuating one's own subjectivity, regarded as the final resort, generating the token value (e.g., relying on one's own experience). Community personalization manifests itself in the token value being "anchored" to the created relationships with the outside world (the ontological unity with one's social networking website account). The philosophical sources of this type of "recognition" of the personalization process are: 1. the vision of the human being in the categorical imperative of Immanuel Kant (human being is a combination of commonality and uniqueness), 2. Emmanuel Mounier's concept of two threats to the Person and his development (focus on the internal world, i.e. Narcissius alienation; focus on the external world, i.e. Hercules alienation).

Secondly, there are two stipulated types of recipient/purchaser of personal token – "own person" and "stranger". In the description of the token and/or token owner, a great number of the researched token profiles refer to social networking websites, with only some providing a detailed address on the website. Thus, it can be concluded that the token was issued specifically for those individuals with whom the token owner had already established relationships on the networking website (the individuals recognize whose token it is).

Thirdly, there are two realms of accentuating the validity of token – private and professional. In referring to social networking websites (the platform distinguishes four websites, i.e. FaceBook, Google+, LinkedIn, and the mandatory Metamask – the blockchain app), a surprisingly great number of individuals neglected LinkedIn which, after all, is specifically a professional-business dedicated website.

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References

[1] Castrén, O., Kavonius, I. K., Rancan, M. (2020). Digital currencies in financial networks, *EBA Staff Paper*, series No 8, June 2020.

[2] Central bank digital currencies (2020). BIS, March.

[3] Coeckelbergh, M., Reijers, W. (2016). Narrative Technologies: A Philosophical Investigation of the Narrative Capacities of Technologies by Using Ricoeur's Narrative Theory. *Human Studies*, 39, pp. 325-346, DOI:10.1007/s10746-016-9383-7.

[4] Crypto-Assets: Implications for financial stability, monetary policy, and payments and market infrastructures (2019). *ECB Occasional Paper*, Series No 230/August.

[5] DeBriun, B. (2015). Ethics and the global financial crisis. Cambridge University Press.

[6] Dembinski, P. H. (2017). Ethics and Responsibility in Finance. New York: Routledge.

[7] Dierksmeier, C., Seele, P. (2016). Cryptocurrencies and Business Ethics. *Journal of Business Ethics*, 152, pp. 1-14, DOI: 10.1007/s10551-016-3298-0.

[8] Ghosh, D. (2008). Corporate Values, workplace Decisions and Ethical Standards of Employees. *Journal of Managerial*, XX(1).

[9] Hughes, K. (2017). Blockchain, The Greater Good, and Human and Civil Rights. *Metaphilosophy*, 48(5), pp. 654-665. DOI: 10.1111/meta.12271.

[10] Initial Coin Offerings (ICOs) for SME Financing, OECD (2019).

[11] Kmita, J., Banaszak, G. (1994). *Społeczno-regulacyjna koncepcja kultury*, Warsaw: Instytut Kultury, p. 43.

[12] Kucz, M. (2019). How to Shape Moral Attitudes in Banking – the Polish example. Finance and common good. No. 46&47, *Observatoire de la Finance*, pp. 61-72.

[13] Lapointe, C., Fishbane, L. (2018). The Blockchain Ethical Design Framework. Georgetown University. http://beeckcenter.georgetown.edu/wp-content/uploads/2018/06/The-Blockchain-Ethical-Design-Framework.pdf.

[14] Lynn, T., Mooney, J. G., Rosati, P., Cummins, M. (eds.) (2019). Disrupting Finance: FinTech and Strategy in the 21st Century. Cham: Palgrave Macmillan.

[15] Mounier, E. (1952). Personalism. Notre Dame: University of Notre Dame Press.

[16] Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System, 2008, https://bitcoin.org/bitcoin.pdf.

[17] Nakamoto, S. (2009). Bitcoin open source implementation of P2P currency, P2P Foundation, https://satoshi.nakamotoinstitute.org/posts/p2pfoundation/1/.

[18] Own initiative Report on Initial Coin Offerings and Crypto-Assets (2019). ESMA, 19 October.

[19] Samman, G., Masanto, A. (2019). The state of stablecoins 2019: hype vs. reality in the race for stable, global, digital money, https://static1.squarespace.com/static/564100e0e4b08c9445a5fc5d/t/5c71e43ef9619ae6c83c30af/1550967911994/The+State+of+Stablecoins+2019_Report+2_20_19.pdf.

[20] Selgin, G. (2015). Synthetic Commodity Money, *Journal of Financial Stability*, 17, April 2015.

[21] Selgin, G. (2017). Money free and unfree, Cato Institute.

[22] Zetzsche, D. A., Arner, D. W., Buckley, R. P. (2020). Decentralized finance, IEL ISSUE BRIEF 02.

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COVID 19 and its Impact on Money Multiplication and Money Supply

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Abstract

At the end of 2019 the world was shaken by a virus, named COVID 19, from the city of Wuhan, Hubei, China. This virus was officially categorized as a pandemic by the World Health Organization, because of its uncontrolled spread throughout the world. Until now, COVID 19 spread to 215 countries in the world with more than 15 million cases. All countries have implemented the lockdown.

The pandemic impacts all sectors of economy, including banking. The research investigates the impact of pandemic on money multiplication in the banking system. The pandemic led to 45% decrease in usage of cash and 60% withdrawals in the world. At the same time, an increase in online shopping and online payment by 72% was noticed. The effect was to reduce the cash in the economy. The money multiplier will change by supplying less cash in the economy. When it will increase, the money multiplication will accelerate. The change of spread of this multiplication will increase the money supply in economy. As it is known, for the recovery of economy, more monetary and fiscal instruments should be made available. The accelerated multiplication in real terms will increase money supply. It will affect the economy in the same way as the tools of the Central banks for the accomplishment of the expanding monetary policy.

Keywords: COVID 19, monetary policy, banking, money multiplier, money supply.

JEL Classification: C20, E51, E52, G21

1. Introduction

At the end of 2019, the world had been shaken by a virus, named COVID 19, from the city of Wuhan, Hubei, China. This virus was officially categorized as a pandemic by the World Health Organization, considering the uncontrolled spread

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throughout the world. Until now, COVID 19 spread to 215 countries in the world with more than 15 million cases. All countries have implemented the lockdown.

The COVID 19 pandemic dramatically impacts on human lives and the economies. The extensive spread has become catastrophic to the global economy, causing strong damage to the global production and supply chains. These changes influence the economy of countries such as Bulgaria, because:

- demand for goods, raw materials and services from developed countries is decreasing;
- delays in the delivery of necessary components from more technologically developed countries are disrupting the value chains;
- other factors - restriction of movement of goods, services and people, inability to reach workplace or the financial limitations, which affect the normal production process.

The quarantining measures during the first wave of the pandemic have accelerated an economic downturn, affecting not only global production and supply, but also international trade, foreign direct investments, international financial markets, and international tourism and travels and at national level – monetary supply, budget spending and government debt.

2. Problem Statement

2.1 Specific monetary conditions in Bulgaria by the Currency Board

The monetary institution in Bulgaria is not the Central Bank. In 1997, the Currency Board was introduced. By the Currency Board there is no active monetary policy implemented. The monetary institution loses more of the instruments by such policy. In the case of Bulgaria, it keeps only the minimum required reserves. The changes in money supply depend on the market forces and follow the same as money demand (Assenova, 2013[3]).

The fluctuation of the economic activity is not significant. The more important instrument for influencing the economic growth is a fiscal policy.

Through the works of the Currency Board, the monetary base and money supply depend on the market forces. They adapt to the changes in the balance of payment at any given time. The mechanism of growth of money supply is different in terms of banking system implemented by the Central Bank from that of the Currency Board. Through the works of the Central Bank, in the banking system, the growth of the reserve money is usually associated with an increase in net domestic assets due to the purchase of government debt or lending to commercial banks. The Bulgarian version of the Currency Board differs from the typical one. The differences in comparison with the standard mechanism of money supply under a Currency Board are as follows:

- The main feature of the Currency Board in Bulgaria – one of the Departments in the former Central Bank, provides the coverage for the monetary liabilities with foreign reserves of the Bulgarian National Bank (BNB) except those form the

international financial institutions. The standard approach provides coverage only for the available local currency;

- The control of money supply by the Currency Board in Bulgaria depends on the fiscal policy. It could be omitted by the politics by using intense fiscal reserve, because this element is a significant part in the liabilities of the Issue Department.

2.2 Literature review – COVID 19 and its impact on the economy

The literature on the economic impacts of the COVID-19 pandemic has been growing during the last months. There are few studies about the economic loss due to influenza as the research of Schoenbaum, (1987[17]). Meltzer and Cox (1999[14]) examined the potential macroeconomic impacts of the influenza pandemic in the US. They estimated that the mean total economic impact for the US economy is $73.1-$166.5 billion. The research on the economics of COVID-19 just started. There are also many works, based on the previous experience, bringing real-time data, and intuitive and policy perspectives from IMF, BIS, World Bank, OECD, UNCTAD. Only Beck (2020[6]) focuses on finance and banking risks created by the pandemic and argues that the effect would depend on three factors – the extent of the economic effects of the pandemic at global level, the fiscal and monetary policy reactions to the shocks, and regulatory reactions addressing possible bank fragility. Most of authors focus on supply or demand chains and their changes. The money multiplication and money supply are not in the topics until now.

2.3 Monetary measures after COVID 19 pandemic

Table 1. Monetary measures after the COVID 19 pandemic

Country	Rate cut	Current rate %	Credit and liquidity measures	Macro-financial measures
Bulgaria	-	-	-	• BGN 7bn liquidity support through banking systems (6% of 2019 GDP); • Allocation of BGN 800mn to provide guarantee/credit to SMEs; • Allocation of BGN 418mn for long-term investment and working capital financing; • BGN 200mn to provide interest-free loans to employees on unpaid leave.

Country	Rate cut	Current rate %	Credit and liquidity measures	Macro-financial measures
Poland	100bp	-	Reduced the required reserve ratio by 300 bps to 0.5%.	• Purchased Polish Treasury securities in the secondary market; • Repealed 3% systemic risk buffer for bank capital requirements; • Introduced a funding programme for bank lending to non-financial private enterprises.
Romania	50bp	2.0	Provided liquidity to credit institutions via repo transactions.	• Purchased government securities on the secondary markets; • Facilitated operational measures to smooth the functioning of payment settlement.
Russia	50bp	5.5	• Sold FX reserves from the National Welfare Fund; • Introduced temporary regulatory facilities for banks to help corporate borrowers.	• A new facility of RUB 500bn for SME lending; • Reduced Deposit Insurance Fund contribution from 0.15 percent to 0.1%.
Turkey	200bp	8.75	• Longer-term instruments at discounted rates; • Reduced the reserve requirements on foreign currency deposits by 500 bps.	• Introduced lending facility for SMEs in the export sector; • Purchases of sovereign bonds; • Reduced the minimum payment for individual credit cards to 20%.

Source: adapted from Sarker (2020[16])

3. Aims of the Research

All countries in the world have taken measures which, if implemented successfully, are predicted to minimize the impact of the crisis after COVIS 19 and to stabilize the economies. The instruments used could be monetary and fiscal. The monetary instruments are easy to use for the recovery of the economy. The research investigates the changes in the monetary multiplier and money supply in the Bulgarian economy. Because of the reduction in cash and the increase in online shopping, it is suggested that, as in other countries in the world, the money multiplier to be reduced and the money supply to rise, which will ensure short-term recovery of the economy after the COVID19 pandemic.

4. Research Methods

The achievement of key targets and the realization of the main aim of the study are accomplished by a systematic theoretical-empirical approach. In particular, this approach is realized through the following:

- Induction and deduction in the research of the facts characterizing the money multiplier, reserve base and money supply before and after the COVID 19 pandemic;
- Comparative analysis of all main variables above before and after the COVID 19 pandemic.

The chosen instruments for achieving the main objectives of the study are extensive statistical data. The data are illustrated with graphics and text application.

The conclusions of the research are based on the results of calculation of main variables before and after pandemic and feedback analysis.

5. Findings

5.1. Reserves of the monetary institution before and after the COVID19 pandemic

The variable determines the volume and the active put into practice of the monetary instruments depends on the Reserves of the Bulgarian National Bank (BNB). In figure 1 are presented the Reserves of BNB and their structure one year before the pandemic and during the pandemic.

BNB disposes from enough reserves to use all appropriate monetary instruments accordingly, in the opinion of the Government Body of the National Bank, and to make strong efforts for the recovery of the Bulgarian economy.

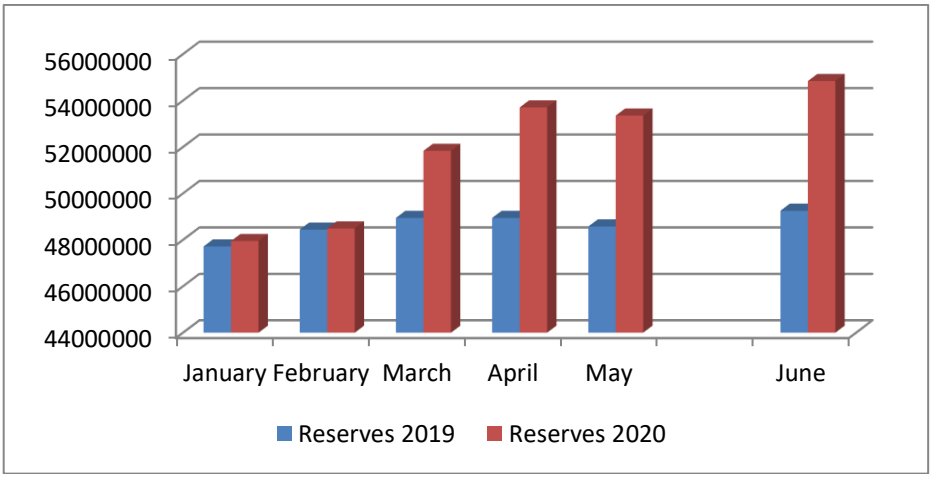

Figure 1. BNB Reserves Balance Sheet 01-06/2019 and 01-06/2020 (thousand BGN)
Source: Monthly Balance Sheets of BNB Issue Department

5.2. Money multiplier and money supply before and after the COVID 19 pandemic

As it is known, the money multiplier depends on three ratios: Cash/Deposits (C/D), Exceeded Bank Reserves/Deposits (ER/D) and Required Reserves/Deposits (rd).

The money multiplier is calculated according to the formula below:

$$\frac{1+\frac{C}{D}}{\frac{C}{D}+\frac{ER}{D}+\text{rd}} \quad (1)$$

The Required Reserves/Deposits ratio in Bulgaria is 10% (BNB, 2016), excluding local and central budget accounts. In this case, it is 0%. The reserve base is the attracted funds of the banks in BGN and foreign currency, with the exception of the funds attracted from other banks and the branches of foreign banks with registered office in the country.

Since September 2019, the BNB applies an interest rate on the excess reserves of banks (BNB, 2016) in the amount of -0.70% due to the reduction in the interest rate on the ECB deposit facility by 10 basis points to -0.50%. The BNB aimed to decrease the maintained excess reserves on BNB accounts. Before the COVID 19 pandemic, exceed reserves reduced sharply. After the onset of the health crisis, the Exceeded Reserves/Deposits ratio increased two times. On the one side, the banks accumulated funds not possibility to invest during the lockdown. On the other side, it shows that some of the measures, introduced from the Government in the banking sector, are not working effectively.

Table 2. Exceeded Reserves/ Deposits Ratio

(%)	**01.2019**	**02.2019**	**03.2019**	**04.2019**	**05.2019**	**06.2019**
	8.16	7.98	8.43	8.30	7.00	6.11
ER/D	**01.2020**	**02.2020**	**03.2020**	**04.2020**	**05.2020**	**06.2020**
	4.73	4.15	8.55	9.13	8.80	10.20

Source: Bulgarian National Bank - Statistics – Brief Monetary Report and own calculations

The pandemic led to 45% decrease in usage of cash and 60% withdrawals in the world. At the same time, an increase in online shopping and online payment by 72% was noticed. The effect was to reduce the cash in the economy. This could change the Cash/Deposits ratio. Below is the same ratio for Bulgaria before and after the COVID 19 pandemic. In Bulgaria, no negative trends in the money/deposits ratios or reduction in cash was noticed. Instead, it impacts negatively on the money multiplier and money supply.

Table 3. Cash/Deposits Ratio

(%)	**01.2019**	**02.2019**	**03.2019**	**04.2019**	**05.2019**	**06.2019**
	19.52	19.38	19.32	19.40	19.68	19.97
C/D	**01.2020**	**02.2020**	**03.2020**	**04.2020**	**05.2020**	**06.2020**
	20.01	19.47	19.78	19.91	19.84	19.91

Source: Bulgarian National Bank - Statistics – Brief Monetary Report

Table 4. Money multiplier

	01.2019	02.2019	03.2019	04.2019	05.2019	06.2019
	3.172	3.196	3.160	3.167	3.263	3.326
m	**01.2020**	**02.2020**	**03.2020**	**04.2020**	**05.2020**	**06.2020**
	3.455	3.553	3.125	3.072	3.101	2.989

Source: Bulgarian National Bank - Statistics – Brief Monetary Report and own calculations

Two of all three ratios, included in the calculation of money multiplier, have changed. As it is written above, they lead to the reduction in the money multiplier. In turn, it impacts on the money supply. Its expanding could be turning the economy to the pre-pandemic level very quickly. This volatility of money multiplier does not have this advantage of monetary instruments.

By the works of the Currency Board, the monetary base and money supply depend on the market forces. The monetary base changed positively compared with the period before the COVID 19 pandemic. The first month after lockdown – March 2020 – it increased sharply by 13.33% and it rises every month. Only in the third month of lockdown, its level was similar to that of previous months.

Table 5. Monetary base

01.2019	02.2019	03.2019	04.2019	05.2019	06.2019
30976349	31025585	31539396	31539396	30696250	30226757
01.2020	**02.2020**	**03.2020**	**04.2020**	**05.2020**	**06.2020**
30977665	30260276	34295480	35290938	35315996	36556856

Source: Bulgarian National Bank - Balance sheets of Issue Department

The changes in the money multiplier and monetary base are reflected in different directions. But for the period of lockdown, the money supply raised in a very small pace from 0.68% for the first month of lockdown to 0.13% in June 2020. In the case of Bulgaria, the money multiplier and money supply did not impact effectively on the economy and hamper the recovery of the economy.

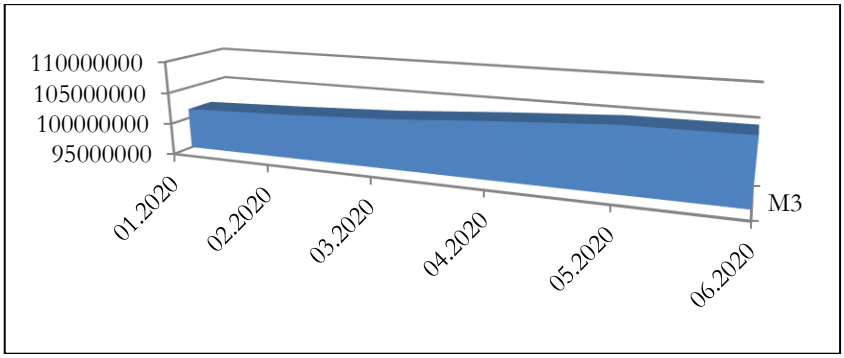

Figure 2. M3 for the period 01-06/2020 (thousand BGN)
Source: Bulgarian National Bank - Brief Monetary Report

6. Conclusions

At the end of 2019 the world was shaken by a virus, named COVID 19, from the city of Wuhan, Hubei, China. This virus was officially categorized as a pandemic by the World Health Organization, because of its uncontrolled spread throughout the world. Until now, COVID 19 spread to 215 countries in the world with more than 15 million cases. All countries have implemented the lockdown.

The quarantining measures during the first wave of the pandemic have accelerated an economic downturn, affecting not only global production and supply, but also international trade, foreign direct investments, international financial markets, and international tourism and travels and at national level – monetary supply, budget spending and government debt.

Since 1997, the monetary institution in Bulgaria is the Currency Board. By the Currency Board there is no active monetary policy implemented. The monetary institution loses more of the instruments by such policy. In the case of Bulgaria, it keeps only the minimum required reserves. The Required Reserves/Deposits ratio in Bulgaria is 10%. The pandemic led to 45% decrease in usage of cash and 60% withdrawals in the world. At the same time, an increase in online shopping and online payment by 72% was noticed. The effect was to reduce the cash in the economy. This could change the Cash/Deposits ratio. In Bulgaria, no negative trends in the money/deposits ratios or reduction in cash was noticed. Instead, it impacts negatively on the money multiplier and money supply.

Before the COVID 19 pandemic, exceed reserves reduced sharply. After the onset of the health crisis, the Exceeded Reserves/Deposits ratio increased two times. On the one side, the banks accumulated funds not possibility to invest during the lockdown. On the other side, it shows that some of the measures, introduced from the Government in the banking sector, are not working effectively. The monetary base changed positively compared with the period before the COVID 19 pandemic. The first month after lockdown – March 2020 – it increased sharply by 13.33% and it rises every month. The changes in the money multiplier and monetary base are reflected in different directions. But for the period of lockdown, the money supply raised in a very small pace from 0.68% for the first month of lockdown to 0.13% in June 2020.

The main goal of the economic policy after the COVID 2019 pandemic aims at the recovery of the economy. It requires that all instruments for influencing on the aggregate supply to be found. This purpose could be achieved with monetary and fiscal instruments. The current research investigates the change in the money multiplier and money supply for the economic growth to be stimulated. For the first months of lockdown in Bulgaria, the monetary instruments were not effective for the quick recovery of the economy up to the pre-crisis level.

References

[1] Acharya, V., & Steffen, S. (2020). Stress Tests for Banks as Liquidity Insurers in a Time of COVID, *Vox, CEPR*, March 22.

[2] Alfani, G. (2020). Pandemics and Asymmetric Shocks, *Vox, CEPR*, April 9.

[3] Assenova, K. (2013). Effectiveness of Specific Monetary Policy by the Currency Board. *Journal Transition studies review*, 20(3), pp. 325-334.

[4] Baldwin, R. (2020). The Supply Side Matters: Guns versus Butter, COVID- style, *Vox, CEPR*, March 22.

[5] Batini, N., Cantelmo, A., Giovanni, M., & Villa, S. (2020). How Loose, How Tight? A Measure of Monetary and Fiscal Stance for the Euro Area, *IMF Working Paper*, No. 20/86, June.

[6] Beck, T. (2020). *Finance in the times of coronavirus*. A VoxEU.org Book, Centre for Economic Policy Research, London. Retrieved fromhttps://voxeu.org/pages/covid-19-page.

[7] Blanchard, O., & Pisani-Ferry, J. (2020). Monetisation: Do Not Panic, *Vox, CEPR*, April 10.

[8] BNB (2016). *Ordinance No. 21 on the Minimum Required Reserves Maintained with the Bulgarian National Bank by Banks*.

[9] BNB. *Reports 2005-2020*, Sofia. Retrieved from www.bnb.bg.

[10] Breitenfellner, A., & Ramskogler, P. (2020). How Deep Will It Fall? Comparing the Euro Area Recessions of 2020 and 2009. *SUERF Policy Notes*, N. 150.

[11] Danielsson, J., Macrae, R., Vayanos, D., & Zingrand, J. P. (2020). The Coronavirus Crisis is no 2008, *Vox, CEPR*, March 26.

[12] Fornaro, L., & Wolf, M. (2020). Coronavirus and Macroeconomic Policy, *Vox, CEPR*, March 10.

[13] Jordà, O., Singh, S. R., & Taylor, A. M. (2020). Onger-Run Economic Consequences of Pandemics. *Covid Economics*, 1(1), pp. 33-42.

[14] Meltzer, M. I., & Cox, N. J. (1999). The economic impact of pandemic influenza in the United States: priorities for intervention. *Emerging Infectious Diseases*, 5(5), pp. 659-671.

[15] National Statistic (2005-2020). Sofia. Retrieved from www.nsi.bg.

[16] Sarker, P. K. (2020). COVID Crisis: Fiscal, Monetary and Macro-financial Policy Responses. Retrieved fromhttps://ssrn.com/abstract=3601524.

[17] Schoenbaum, S. C. (1987). Economic impact of influenza. The individual's perspective. *American Journal of Medicine*, 82(6A), pp. 26-30.

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Financial Consumers – Promoters of Sustainable Development? Evidences from Europe and Central Asia

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Abstract

Achieving the goals of sustainable development is a complex process that requires a sustained financial effort on the part of public authorities and a major involvement on the part of international institutions. In addition, both public authorities and international bodies must create the legislative framework to support the promotion of the principles of sustainable development at various levels of economic activity. Given the complexity and importance of promoting sustainable development, citizens also play an important role in this process. This category of stakeholders can be involved in various forms, both through proactive and reactive behaviour. Thus, they must be responsible in the consumption process, but they must sanction through specific mechanisms the opportunistic or irresponsible behaviour of some companies. Given the importance of financial resources to support the process of transition to a green economy, citizens must be able to make the best possible financial decisions, both in the process of saving and investing. For this reason, financial education acquires new values, given the repercussions that a wrong financial decision can have both economically and socially. However, financial education is just one of the pillars supporting the process of promoting sustainable development. Sustained efforts must also be made by financial institutions and financial market supervisory authorities in the process of reducing social exclusion. The current health crisis has demonstrated the importance of digitizing financial operations. Financial innovation and Fintech must be focused on increasing financial inclusion and attracting vulnerable groups to the financial circuit. The goal of the research consists in analysing the evolution of two global financial inclusion indicators which are among the pillars of digitizing the financial operations. The values of the two global financial inclusion indicators mentioned above were computed by the Word Bank in 2014 and 2017. The research focuses on analysing the values of the two indicators by gender, for 48 countries from Europe and Central Asia.

Keywords: Financial consumers, sustainable development, CSR, Central and Eastern Europe.

JEL Classification:D1, G1

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1. Introduction

Financial markets are going through a complex process of transformation that targets both the behaviour of financial institutions and the attitude of portfolio investors and financial consumers (Rjoub, 2012, Matei, 2013, Andrei et al. 2018, Zamora-Polo & Sánchez-Martín, 2019, Bali Swain & Yang-Wallentin, 2020; Edwards et al. 2020, Horne et al., 2020, Moyer & Hedden, 2020,). The paradigm shifts that take place on the financial market are fuelled by numerous economic, social, political and environmental factors (Goodell et al., 2020). For example, more and more banks and stock exchanges have become aware of their role in promoting the principles of sustainable development and offer financial products and services that include certain ESG aspects (Forgione & Migliardo, 2020). In addition, financial institutions also have at their disposal specific principles such as the Equator Principles through which they can model the behaviour of borrowers in the sense that they must meet certain social and environmental criteria in order to receive the requested financing (Scholtens & Dam, 2007; Conley & Williams, 2011; Wright, 2012). Stock markets are also taking important steps in this regard, because they have either launched sustainability stock market indices or created special market segments where only companies that meet certain ESG criteria can be listed (Missbach, 2004; Wright & Rwabizambuga, 2006). Thus, the stock exchanges also have embraced the idea of sustainability, thus being interested in the initiatives launched by the UN on sustainable stock exchanges. The activity of the issuing companies is also in the same trend, because specific financial instruments such as green bonds have been issued (Reboredo, 2018; Reboredo & Ugolini, 2020).

On the other hand, the portfolio investors have considerably noticed their behaviour and more and more buyers on the stock market consider not only risk profitability criteria but also certain ESG criteria when selecting the traded securities. Financial consumers have also become important players in the sense that they are increasingly aware of the forces that can exert it on the financial market (McWilliam, & Siegel, 2000; Unit & Britain, 2001, Öberseder et al., 2011; Hira, 2012, Tang et al., 2012, Raimi et al., 2015, Iacovoiu , 2018, Palazzo, 2019, Carpena & Zia, 2020, Nousheen et al., 2020). This metamorphosis of financial markets has been fuelled by scandals and financial crises that have undermined consumer confidence in credit institutions. To this was added the explosion of the financial innovation process that brought on the market complex assets, sophisticated and difficult to understand and evaluate even by specialists. These assets have proven their toxic character, considering the consequences of the securitization process and the onset of the international financial crisis in 2008 on the American market (Matei, 2013). For these reasons, the concept of social responsibility has crystallized, which must change the classic behaviour of financial institutions that were oriented only towards maximizing the wishes of shareholders. A new category of stakeholders, namely financial consumers, has become one of the priorities of credit institutions (Ene, 2017).

2. Problem Statement

The international financial crisis launched in 2008 dramatically changed the balance of power in the financial market (Purfield & Rosenberg, 2010; Erkens et al., 2012). If until then, credit institutions taught the conditions on the banking market and had a strong position, with the crisis, their selfish and irresponsible behaviour towards different categories of stakeholders came to light. Maximizing shareholders' profits and personal benefits have led credit institution managers to engage in fierce competition by launching misleading advertising campaigns, abusive contractual clauses or complex financial instruments, difficult to assess even by rating agencies (Ivashina & Scharfstein, 2010). The economic and social consequences have demonstrated the fragility of financial consumers in the face of financial giants (Chari et al., 2008; Munir, 2011; Frankel & Saravelos, 2012). Gradually, with the promotion of the concepts of CSR and sustainable development, financial consumers have become a force that reshapes the behaviour of credit institutions. The support provided by national consumer protection authorities is bearing fruit, and the position of financial consumers on the market is improving dramatically. Financial education programmes and the financial inclusion process have started from the credit institutions improving the force of financial consumers (Voica, 2017).

3. Research Questions / Aims of the Research

The goal of the research consists in analysing the evolution of two global financial inclusion indicators which are among the pillars of digitizing the financial operations, i.e. the financial consumers who received private sector wages in the past year, and respectively, who received public sector wages in the past year. The purpose of the research is to highlight the differences between countries and to identify clusters of countries with similar policy in financial inclusion.

4. Research Methods

The values of the two global financial inclusion indicators mentioned above were computed by the Word Bank in 2014 and 2017. The research focuses on analysing the values of the two indicators by gender, for 48 countries from Europe and Central Asia which belong to all income levels (high income, upper middle income, low middle income, and low income).

5. Findings

As it was previously mentioned, the analysis focuses on the financial consumers who received private sector wages in the past year, and respectively, who received public sector wages in the past year.

5.1. Analysis of the financial consumers who received private sector wages in the past year

The financial consumers who received private sector wages in the past year, by gender, in the countries from Europe and Central Asia are depicted in figure 1.

In 2014, the highest number of female financial consumers who received private sector wages in the past year was in the case of Austria (45.3%), Estonia (44.7%), Netherlands (43.7%), Switzerland (43.4%), and Belgium (38.8%). At the opposite pole, the smallest number, excepting Turkmenistan which did not reported, is for Tajikistan (4.7%), Azerbaijan (7%), Armenia and Kosovo (7.9%), Albania (8.2%), and Uzbekistan (9.3%). In the same year, the highest number of male financial consumers who received private sector wages in the past year was as follows: France (55.4%), Netherlands (53.1%), Denmark (52.7%), Estonia (50.7%), and Austria (48.6%). By contrast, the smallest number (excepting Turkmenistan from the same cause) was for Tajikistan (15.4%), Georgia (16.2%), Kyrgyz Republic (16.4%), Albania (17.2%), and Armenia (19.4%).

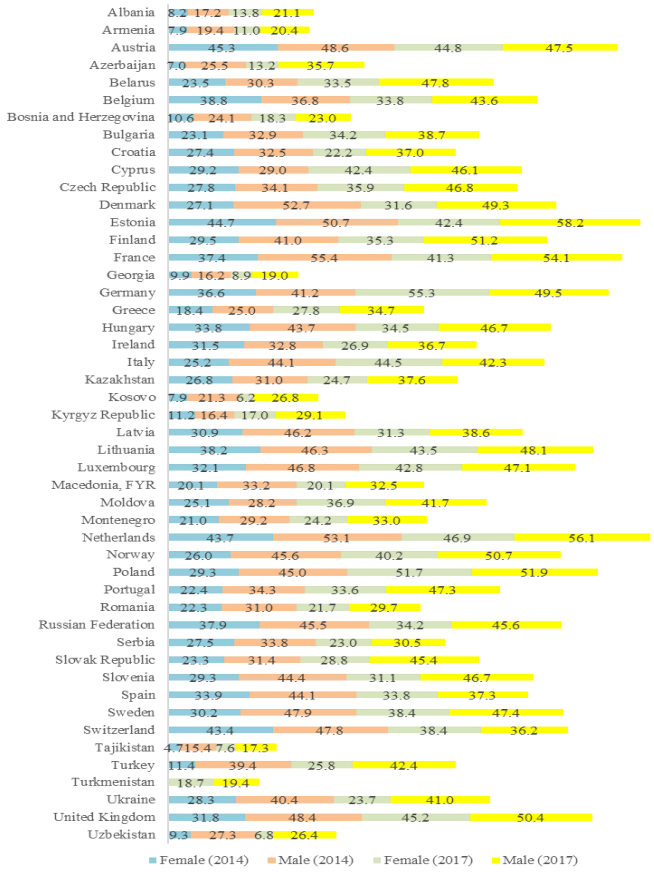

Figure 1. Financial consumers who received private sector wages in the past year, by gender, in the countries from Europe and Central Asia (%)

Source: Developed by the authors based on data from The Word Bank (2018)

In 2017, the highest number of female financial consumers who received private sector wages in the past year was in the case of Germany (55.3%), Poland (51.7%), Netherlands (46.9%), United Kingdom (45.2%), and Austria (44.8%). On the contrary, the smallest number was for Kosovo (6.2%), Uzbekistan (6.8%), Tajikistan (7.6%), Georgia (8.9%), and Armenia (11%). In the same year, the highest number of male financial consumers who received private sector wages in the past year was as follows: Estonia (58.2%), Netherlands (56.1%), France (54.1%), Poland (51.9%), and Finland (51.2%). The smallest number of male financial consumers who received private sector wages in the past year was in Tajikistan (17.3%), Georgia (19%), Turkmenistan (19.4%), Armenia (20.4%), and Albania (21.1%).

Concerning the highest increase in 2017 as compared to 2014 in the female financial consumers who received private sector wages in the past year, the following cases can be underlined: Turkey (126.3%), Azerbaijan (89.6%), Poland (76.3%), Bosnia and Herzegovina and Italy (76.2%), and Albania (69.2%). As regards the highest decrease in the same indicator, the ranking is as follows: Uzbekistan (-26.9%), Kosovo (-21.3%), Croatia (-19.1%), Serbia and Ukraine (-16.5%), and Ireland (-14.4%).

With reference to the highest increase in 2017 as compared to 2014 in the male financial consumers who received private sector wages in the past year, there were cases such as: Kyrgyz Republic (77.9%), Cyprus (58.6%), Belarus (58%), Republic of Moldova (47.8%), and Slovak Republic (44.2%). Relating to the highest decrease in the same indicator, the top five countries are as follows: Switzerland (-24.1%), Latvia (-16.5%), Spain (-15.3%), Serbia (-9.8%), and Denmark (-6.5%).

5.2. Analysis of the financial consumers who received public sector wages in the past year

Figure 2 shows the financial consumers who received public sector wages in the past year, by gender, in the countries from Europe and Central Asia.

In 2014, the highest number of female financial consumers who received public sector wages in the past year was reported in the case of Norway (41.9%), Sweden (35.8%), Belarus (33%), Denmark (32.4%), and Finland (26%). By contrary, the smallest number, excepting Turkmenistan which did not reported, was in the case of Italy and Turkey (3.1%), Kosovo (3.3%), Austria (3.8%), Bosnia and Herzegovina (5.2%), and Lithuania (5.9%). In the case of male financial consumers who received public sector wages in the past year, the highest number was as follows: Belarus (32.6%), Norway (22.6%), Azerbaijan (21.6%), Finland (21.2%), and Sweden (20.9%). By contrast, the smallest number (excepting Turkmenistan from the same cause) was reported for Italy (2.8%), Turkey (5.5%), Austria (5.6%), France and Kyrgyz Republic (6.5%), and Albania (6.8%).

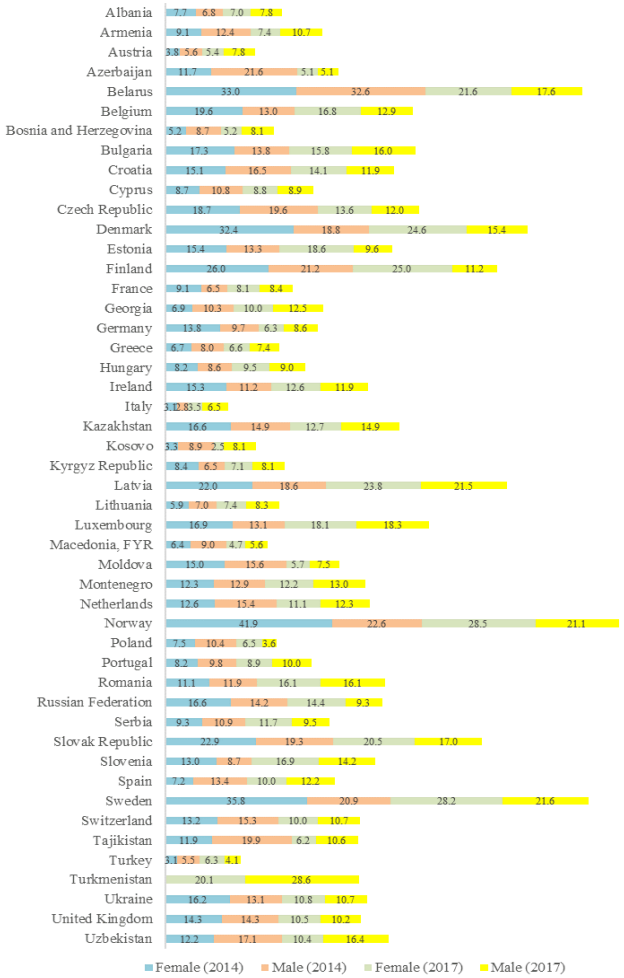

Figure 2. Financial consumers who received public sector wages in the past year, by gender, in the countries from Europe and Central Asia (%)

Source: Developed by the authors based on data from The Word Bank (2018)

In 2017, the highest number of female financial consumers who received public sector wages in the past year was in the case of Norway (28.5%), Sweden (28.2%), Finland (25%), Denmark (24.6%), and Latvia (23.8%). At an opposite pole, the smallest number was reported for Kosovo (2.5%), Italy (3.5%), Macedonia (4.7%), Azerbaijan (5.1%), and Bosnia and Herzegovina (5.2%). As regards the male financial consumers who received public sector wages in the past year, the highest number was in the case of Turkmenistan (28.6%), Sweden (21.6%), Latvia (21.5%), Norway (21.1%), and Luxembourg (18.3%). At the same time, the smallest number was reported for Poland (3.6%), Turkey (4.1%), Azerbaijan (5.1%), Macedonia (5.6%), and Italy (6.5%).

As for the highest increase in 2017 as compared to 2014 in the female financial consumers who received public sector wages in the past year, the following cases

can be highlighted: Turkey (100.3%), Romania (44.5%), Georgia (43.7%), Austria (42.8%), and Spain (39.5%). Concerning the highest decrease for the same indicator, the ranking is as follows: Republic of Moldova (-61.6%), Azerbaijan (-56.3%), Germany (-54.6%), Tajikistan (-48%), and Belarus (-34.4%).

With respect to the highest increase in 2017 as compared to 2014 in the male financial consumers who received public sector wages in the past year, there were cases such as: Italy (134.8%), Slovenia (63.4%), Luxembourg (39.6%), Austria (38.9%), and Romania (34.9%). Regarding the highest decrease in the same indicator, the top five countries are as follows: Azerbaijan (-76.3%), Poland (-65.4%), Republic of Moldova (-51.9%), Finland and Tajikistan (-46.9%), and Belarus (-45.8%).

6. Conclusions

Financial inclusion is a complex, lengthy process that is based on the partnership between credit institutions and financial consumers. Financial consumers must show responsibility in decision-making but also receptivity to bank products given the transformations generated by digitalization and financial innovation. Credit institutions must have a policy of attracting financial consumers differentiated according to their certain characteristics such as gender, professional training, or age. So, financial consumers must trust credit institutions in order to initiate and run different operations. In this way, the money from informal economy is brought in formal financial systems. That means better financial decisions and more financial resources for sustainable finance.

In 2014, the highest number of the financial consumers both females and men and who received private sector wages in the past year lived in Austria and Netherlands and those who received public sector wages in the past year were from Norway, Sweden, Belarus, and Finland. For the same year, the smallest number of the financial consumers both females and men who received private sector wages in the past year lived in Tajikistan, Albania, and Armenia, and those who received public sector wages in the past year were from Italy, Turkey, and Austria. In 2017, the highest number of the financial consumers both females and men and who received private sector wages in the past year lived in Poland, and those who received public sector wages in the past year were from Norway, Sweden, and Latvia. For the same year, the smallest number of financial consumers both females and males who received private sector wages in the past year lived in Tajikistan, Georgia, and Armenia, and those who received public sector wages in the past year were from Italy, Macedonia, and Azerbaijan. In 2017 as opposed to 2014, there were 31 out of 47 countries in which the number of the female financial consumers who received private sector wages in the past year has increased, and 16 out of 47 countries in which its number decreased. In the case of the male financial consumers who received private sector wages in the past year, there were 34 out of 47 countries in which their number rise, and 13 out of 47 countries in which their number declined. For the same comparison of years, there were 16 out of 47 countries in which the number of female financial consumers who

received public sector wages in the past year has increased, and 31 out of 47 countries in which its number declined. For male financial consumers who received public sector wages in the past year, there were 17 out of 47 countries in which their number rise, and 30 out of 47 countries in which their number has declined. Turkmenistan was not included in the cluster because it did not have reported data in 2014. This situation is explained by the changes of the employees' weight from the public to the private sector. Future research can analyse other global financial inclusion indicators such as account use, credit, payments, savings, etc. for a particular country or for countries from a specific region (East Asia, Latin America, Caribbean, Middle East, North America, South Africa, etc.).

References

[1] Andrei, J. V., Panait, M, Voica, C. (2018). Challenges and Approaches for the Corporate Social Responsibility and Human Resource Management in the Financial Sector. Economics, *Management and Financial Markets*, 2018 Sep 1, 13(3), pp. 415-31.

[2] Bali Swain, R., & Yang-Wallentin, F. (2020). Achieving sustainable development goals: predicaments and strategies, *International Journal of Sustainable Development & World Ecology*, 27(2), pp. 96-106.

[3] Carpena, F., & Zia, B. (2020). The causal mechanism of financial education: Evidence from mediation analysis, *Journal of Economic Behaviour & Organization*, 177, pp. 143-184.

[4] Chari, V. V., Christiano, L., & Kehoe, P. J. (2008). Facts and Myths about the Financial Crisis of 2008. *Federal Reserve Bank of Minneapolis Working Paper*, 666.

[5] Conley, J. M., & Williams, C. A. (2011). Global banks as global sustainability regulators?: The equator principles, *Law & Policy*, 33(4), pp. 542-575.

[6] Edwards, D. B., Sustarsic, M., Chiba, M., McCormick, M., Goo, M., & Perriton, S. (2020). Achieving and Monitoring Education for Sustainable Develgopment and Global Citizenship: A Systematic Review of the Literature, *Sustainability*, 12(4), p. 1383.

[7] Ene C. (2017). Current Issues Regarding The Protection Of Retail Investors On The Capital Market Within The European Union. The USV Annals of Economics and Public Administration, 17(1 - 25), pp. 35-44.

[8] Erkens, D. H., Hung, M., & Matos, P. (2012). Corporate governance in the 2007-2008 financial crisis: Evidence from financial institutions worldwide, *Journal of corporate finance*, 18(2), pp. 389-411.

[9] Forgione, A. F., & Migliardo, C. (2020). CSR engagement and market structure: Evidence from listed banks. *Finance Research Letters*, 101592.

[10] Frankel, J., & Saravelos, G. (2012). Can leading indicators assess country vulnerability? Evidence from the 2008 - 09 global financial crisis, *Journal of International Economics*, 87(2), pp. 216-231.

[11] Goodell, J. W., McGee, R. J., & McGroarty, F. (2020). Election uncertainty, economic policy uncertainty and financial market uncertainty: A prediction market analysis, *Journal of Banking & Finance*, 110, 105684.

[12] Hira, T. K. (2012). Promoting sustainable financial behaviour: implications for education and research. *International Journal of Consumer Studies*, 36(5), pp. 502-507.

[13] Horne, J., Recker, M., Michelfelder, I., Jay, J., & Kratzer, J. (2020). Exploring entrepreneurship related to the sustainable development goals-mapping new venture activities with semi-automated content analysis, *Journal of Cleaner Production*, 242, 118052.

[14] Iacovoiu, VB. (2018). An Empirical Analysis of Some Factors Influencing Financial Literacy, *Economic Insights-Trends and Challenges*, 70(2).

[15] Ivashina, V., & Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. *Journal of Financial economics*, 97(3), pp. 319-338.

[16] Matei, M. (2013). *Responsabilitatea socială a corporaţiilor şi instituţiilor şi dezvoltarea durabilă a României*, Bucharest, Expert Publishing House.

[17] McWilliams, A., & Siegel, D. (2000). Corporate social responsibility and financial performance: correlation or misspecification?, *Strategic Management Journal*, 21(5), pp. 603-609.

[18] Missbach, A. (2004). The Equator Principles: Drawing the line for socially responsible banks? An interim review from an NGO perspective, *Development*, 47(3), pp. 78-84.

[19] Moyer, J. D., & Hedden, S. (2020). Are we on the right path to achieve the sustainable development goals?, *World Development*, 127, 104749.

[20] Munir, K. A. (2011). Financial crisis 2008-2009: What does the silence of institutional theorists tell us?, *Journal of Management Inquiry*, 20(2), pp. 114-117.

[21] Öberseder, M., Schlegelmilch, B. B., & Gruber, V. (2011). Why don't consumers care about CSR?: A qualitative study exploring the role of CSR in consumption decisions. *Journal of Business Ethics*, 104(4), pp. 449-460.

[22] Palazzo, M. (2019). Linking Cultural Dimensions and CSR Communication: Emerging Research and Opportunities: Emerging Research and Opportunities, *IGI Global*.

[23] Purfield, M. C., & Rosenberg, M. C. B. (2010). Adjustment under a currency peg: Estonia, Latvia and Lithuania during the global financial crisis 2008-09 (No. 10-213), *International Monetary Fund*.

[24] Raimi, L, Akhuemonkhan I, Ogunjirin, O. D. (2015). Corporate Social Responsibility and Entrepreneurship (CSRE): antidotes to poverty, insecurity and underdevelopment in Nigeria, *Social Responsibility Journal*.

[25] Reboredo, J. C. (2018). Green bond and financial markets: Co-movement, diversification and price spillover effects, *Energy Economics*, 74, pp. 38-50.

[26] Reboredo, J. C., & Ugolini, A. (2020). Price connectedness between green bond and financial markets, *Economic Modelling*, 88, pp. 25-38.

[27] Rjoub, H. (2012). Stock prices and exchange rates dynamics: Evidence from emerging markets, *African Journal of Business Management*, 6(13), pp. 4728-4733.

[28] Scholtens, B., & Dam, L. (2007). Banking on the equator. Are banks that adopted the equator principles different from non-adopters?, *World Development*, 35(8), pp. 1307-1328.

[29] Tang, Z., Hull, C. E., & Rothenberg, S. (2012). How corporate social responsibility engagement strategy moderates the CSR – financial performance relationship, *Journal of Management Studies*, 49(7), pp. 1274-1303.

[30] The Word Bank (2018). *DataBank. Global Financial Inclusion*. Retrieved from https://databank.worldbank.org/reports.aspx?source=global-financial-inclusion# (accessed 03 August 2020).

[31] Unit, S. E., & Britain, G. (2001). *Preventing social exclusion*, London, Cabinet Office.

[32] Voica, M. C. (2017). Financial inclusion as a tool for sustainable development, *Romanian Journal of Economics*, 44(1 (53)), pp. 121-129.

[33] Wright, C. (2012). Global banks, the environment, and human rights: The impact of the Equator Principles on lending policies and practices, *Global Environmental Politics*, 12(1), pp. 56-77.

[34] Wright, C., & Rwabizambuga, A. (2006). Institutional pressures, corporate reputation, and voluntary codes of conduct: An examination of the equator principles, *Business and Society Review*, 111(1), pp. 89-117.

[35] Zamora-Polo, F., & Sánchez-Martín, J. (2019). Teaching for a better world. Sustainability and sustainable development goals in the construction of a change-maker university, *Sustainability*, 11(15), p. 4224.

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Research Regarding the Reactions of Romanian Facebook Users on COVID-19 Pandemic

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Abstract

Social media plays a very important role during difficult periods like the one we are living in right now due to the life-threatening COVID-19 pandemic. People get online news in real time about statistics, rules that were imposed by the authorities or about personal experiences shared by others in order to raise awareness, to manipulate or to get a certain type of attention. The individuals have a predisposition to take decisions based on what they are seeing on social media and their decisions have a great impact on health as well as on economy trends. The purpose of our study was to examine the social media coverage and to identify the reaction of people following specific posts as well as to check whether if there has been a link between their online reaction and the general trend of the virus in Romania, knowing that the country is more and more affected daily by this pandemic. For this study, we have used exploratory research of in-depth content analysis in order to understand the reactions to the daily news published by a national authority. We collected secondary data from Facebook posts, analysing the reactions used in terms of "emojis", as well as the number of comments and the number of shares, comparing their reaction to the number of sick people in that specific period. Our results show that the number of reactions to the posts has decreased but people use all kind of emojis they have at their disposal, mostly the classic "like" but also the "angry", "haha" in order to express emotions and beliefs and this could be associated with their behaviour in real life during pandemic.

Keywords: social media, Covid-19 pandemic, official news coverage, reactions, economy.

JEL Classification: M14, D83, L82, L86

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1. Introduction

Companies, institutions and all kind of organization are trying nowadays to build a relationship with their target customers based on trust. In order to do so, the social media is the main channel for creating a brand and making it successful (Marshall, 2013). A brand needs to have a large coverage on social media using different platforms in order to get to as many people as possible, making sure in the same time to have a coherent communication. Also, for people it becomes much easier to get information on something they are interested in using social media. Social media is an environment where one can use one's creativity in order to become original, popular and differentiate from the others.

Social media is finding its way to an amazing increase, being very useful for communication as well as free advertisement for public institutions. Social media allow them to communicate with their target public creating a community around them. Also, using more platforms, it is needed in order to get to different people according the age groups, for example.

Nowadays, it is very difficult to be visible and make a campaign for a public service without being also present online (LPCPON, 2017). Public institutions want to reach to as many citizens as possible and provide them with all information they may need. In periods of crisis like the one that we are living this year, the COVID-19 pandemic, people have increased the time they spend online and have been using social media for many purposes. According to a study based on a questionnaire addressed to 1,002 French people, 55% of them said they cannot go through lockdown without social media that they are using to watch funny content, continue to their daily rituals, meet virtually with family and friends, get informed about the current situation and work out to stay fit (Comarketing-News, 2020).

It is crucial that public institutions stay in contact with the population in order to make sure the information they are getting is the correct one, because fake news are easily spread making people confuse, anxious and sometimes provoking bad behaviours. Not only an online communication between the citizen and the public institution is needed, but it is also an important occasion to create a good environment for creating connexion and ensuring better collaboration.

The aim of our research is to analyse the reactions of the population on the well-known online platform Facebook to the daily updates made by the Romanian Ministry of Health on the COVID-19 crisis. All these posts have the same title informing the reader what he or she is going to read in the news; they have a date, an hour and the same format. Our study is focused on the number of comments of the followers as well as the number and the type of emojis used as a reaction to each post, analysing the most popular comments as well. The idea behind our study is to identify if there has been a specific trend among the population in terms of reactions as well as to correlate the data with economic aspects taking place in the same time frame.

2. Problem Statement

Being an important topic worldwide, the COVID-19 pandemic has also started an "infodemic", making social media a vulnerable place when it comes to misinformation or manipulation of people. To slow this trend of continuous unverified information, the United Nations have launched a campaign on June 20th, when we celebrate the International Day of Social Media. This campaign called "Pause" has a purpose to make people to take a look and review the information they are about to share, because most of the times this one is generated by important emotions that turn into comments, shares or emojis (United Nations, 2020).

The COVID-19 pandemic is affecting the population worldwide not only in terms of health, but also in all life aspects: social, psychological, professional and economic life is clearly suffering as well. Because it is affecting us at all possible levels, communication and information we receive is a key factor in taking decisions and the consequences of these decisions are impacting everyone around us because we are talking about a highly contagious virus. Knowing this, it is extremely important that people receive up to date information on social media about the health system. According to a study examining the content of the news posted online about the pandemic, using Google Videos, the most recurrent topic was death and death rate, as well as different kind of anxieties about the health crisis we are going through, while important information about how to prevent the spread of the disease didn't get very much attention (Basch et al., 2020).

In such important periods as the one we are living in, fake news are spreading very easily, people around the world taking advantage of the situation in order to manipulate and also people being manipulated themselves and sharing information without verifying it properly, like it happened with Twitter hashtag #5GCoronavirus (Ahmed et al., 2020). Multiple type of fake news appeared on social media "5G causes COVID-19; drinking bleach can cure it; Bill Gates is behind it" (Holmes, 2020).

At the same time, people pay much more attention to what they chose to disclose on social media during a health crisis because the way they behave may have an impact on many people and also it is linked to the way other perceive them (Nabity-Grover et al., 2020).

A study based on a survey was conducted in order to analyse the source of information as well as misinformation when it comes to healthcare professionals from India and it showed that misinformation is mostly coming from social media and "seventy-four percent of respondents felt the need for regulation of information during such times" (Datta et al., 2020).

Also, between March and Avril 2020, Romanian people spent more than EUR 325,000 in pharmacies (Iacob, 2020). Before as well as during the lockdown, people had a predisposition for buying more groceries, especially, for example, pasta and vegetables for health reasons (Laguna et al., 2020).

3. Research Questions / Aims of the Research

This article analyses the online reactions of Facebook users when it comes to updates about COVID-19 pandemic. The purpose of this research is to verify whether there could be any interferences between the updates shared (total of infected cases, daily new cases, deaths, asymptomatic people, etc.) and the reactions of people (comments, shares, emoji), analysing the general feelings shared following the 7 possible reactions on Facebook (like, haha, sad, angry, wow, care, love). Actually, since the social media increased its role when it comes to people's personal and professional lives during the pandemic, Facebook introduced the 7th emoji on the timeline, a face embracing a heart which represents "care", "we're launching new Care reactions on @facebookapp and @messenger as a way for people to share their support with one another during this unprecedented time", said Facebook communication manager Alexandru Voica on Twitter (ABC 7 NEWS, 2020).

This paper answers to the question if the general trend is for reactions to increase at the same time as the daily new cases and if most important percentage of reactions is represented by the "care" emoji implemented by Facebook.

4. Research Methods

Our research focuses on the analysis of the daily update posts made by the Romanian Ministry of Health. The health situation in Romania has worsened in the past few weeks, but the lockdown as the last solution to counteract the spread of the virus (Bădilă, 2020).

We have chosen to focus on the period from July 21st to July 29th in order to analyse the press updates made on the page of the Ministry of Health. Their official page has been liked by 222,920 people until July 30th, 2020 and 364,019 people are following their posts. It is a Government Organization and we can see it is a verified account, therefore a trustful source of information.

We have chosen these sample as July 21st is the last day when Romania had less than 1,000 new daily cases which is an important number, compared, for example, with May 14th, the last day of lockdown when Romania had 245 new cases or May 15th with 190 new cases (Ministerul Sănătăţii România, 2020). Our target population are the people following the daily posts made by the Ministry of Health (the source of the information being The Group for Strategic Communication). Exploratory research of in-depth content analysis has been used for our research to gain a deep understanding of people's reactions on Facebook during COVID-19 pandemic and we used IBM SPSS Statistics for the interpretation of our data, using correlations as well as case summaries.

5. Findings

5.1 Type of data collected from the update posts

We collected our data in an Excel file, by date, starting with July 21st and finishing on July 29th and we have manually collected numbers from the Facebook page of the Ministry of Health in Romania. We were interested in the following aspects: time of the posts, total confirmed cases, recovered cases, daily new cases, asymptomatic persons, number of deaths, number of comments, and shares of the posts as well as the number of every emoji used.

In Table 1 below, we can see that the maximum number of daily new cases reached 1,284 by July 29th and all categories have known an increase over the days, including the recovered and asymptomatic people.

Table 1. Case summaries for all categories of cases

Case Summaries[a]

		Confirmed Cases	Recovered	Daily New Cases	Asymptomatics	Deaths
1		48235	26446	1182	3870	2269
2		47053	26128	1151	3716	2239
3		45902	25794	1104	3440	2206
4		44798	25643	1120	3572	2187
5		43678	25373	1284	3106	2165
6		42394	25349	1119	2918	2150
7		41275	24862	1112	2787	2126
8		40163	24663	1030	2693	2101
9		39133	24454	994	2612	2074
Total	N	9	9	9	9	9
	Mean	43625.67	25412.44	1121.78	3190.44	2168.56
	Median	43678.00	25373.00	1119.00	3106.00	2165.00
	Minimum	39133	24454	994	2612	2074
	Maximum	48235	26446	1284	3870	2269
	Sum	392631	228712	10096	28714	19517

a. Limited to first 100 cases.

Source: Authors' own research

5.2 Type of reactions to the daily updates

The most used emoji was the like button, as we can see in table 2, with a mean of 511.68 during the period of 9 days that we study in our research and the maximum number of likes used was 3,100. At the same time, we can notice that the love and care emoji which could be used to express solidarity, especially the last one mentioned who was precisely put in place for this pandemic, are the least used. A surprise has been to see that emoji like "Haha" has been used a lot of times, reaching its maximum during nine days at 477, when Romania already had more than 1,000 new infected people per day.

Table 2. Case Summaries on the use of emojis

Case Summaries[a]

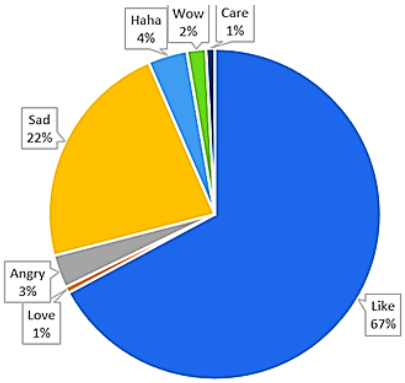
		Comments	Like	Love	Shares	Care	Angry	Wow	Haha	Sad
1		46	65	0	23	1	15	2	8	29
2		121	151	2	25	3	10	4	15	63
3		279	230	2	56	7	30	4	13	99
4		237	221	1	60	4	18	5	12	99
5		289	269	2	74	8	37	8	17	125
6		1100	3	24	519	28	179	134	477	874
7		189	257	2	89	8	9	8	32	100
8		373	309	2	78	8	13	4	37	136
9		433	3100	29	410	34	139	91	152	1000
Total	N	9	9	9	9	9	9	9	9	9
	Mean	340.78	511.68	7.11	148.22	11.22	50.00	28.89	84.78	280.56
	Median	279.00	230.00	2.00	74.00	8.00	18.00	5.00	17.00	100.00
	Minimum	46	3	0	23	1	9	2	8	29
	Maximum	1100	3100	29	519	34	179	134	477	1000
	Sum	3067	4605	64	1334	101	450	260	763	2525

a. Limited to first 100 cases.

Source: Authors' own research

Also, in the chart below, we can see the percentage of use for all types of existing emojis.

Graph 1. The percentage of use for each emoji



Source: Authors' own research

5.3 Correlations between data

Our research presents the Pearson Correlation Coefficient calculated for all points we retrieved from Facebook posts. Using this coefficient, we can see if two variables are positively or negatively correlated (Pearson Correlation Coefficient situated between -1 and +1).

In table 3, we can see a positive correlation significant at the 0.01 level between confirmed and asymptomatic cases, between recovered and deaths and recovered and asymptomatic. Also, there is a negative correlation between the use of care emoji and confirmed cases, daily new cases and deaths, meaning that when one increases, the other one decreases. We can also see a positive correlation between the use of emoji, between "care" and "like" and "care" and "haha".

Table 3. Correlations between reactions and cases

		Confirmed Cases	Daily New Cases	Recovered	Deaths	Asymptomatics	Like	Haha	Care
Confirmed Cases	Pearson Correlation	1	.601	.992**	.996**	.978**	-.571	-.347	-.680*
	Sig. (2-tailed)		.087	.000	.000	.000	.108	.360	.044
	N	9	9	9	9	9	9	9	9
Daily New Cases	Pearson Correlation	.601	1	.596	.600	.514	-.581	-.204	-.506
	Sig. (2-tailed)	.087		.090	.088	.157	.101	.598	.165
	N	9	9	9	9	9	9	9	9
Recovered	Pearson Correlation	.992**	.596	1	.995**	.967**	-.583	-.238	-.619
	Sig. (2-tailed)	.000	.090		.000	.000	.099	.538	.076
	N	9	9	9	9	9	9	9	9
Deaths	Pearson Correlation	.996**	.600	.995**	1	.969**	-.595	-.314	-.677*
	Sig. (2-tailed)	.000	.088	.000		.000	.091	.411	.045
	N	9	9	9	9	9	9	9	9
Asymptomatics	Pearson Correlation	.978**	.514	.967**	.969**	1	-.492	-.396	-.680*
	Sig. (2-tailed)	.000	.157	.000	.000		.178	.291	.044
	N	9	9	9	9	9	9	9	9
Like	Pearson Correlation	-.571	-.581	-.583	-.595	-.492	1	.096	.702*
	Sig. (2-tailed)	.108	.101	.099	.091	.178		.806	.035
	N	9	9	9	9	9	9	9	9
Haha	Pearson Correlation	-.347	-.204	-.238	-.314	-.396	.096	1	.761*
	Sig. (2-tailed)	.360	.598	.538	.411	.291	.806		.017
	N	9	9	9	9	9	9	9	9
Care	Pearson Correlation	-.680*	-.506	-.619	-.677*	-.680*	.702*	.761*	1
	Sig. (2-tailed)	.044	.165	.076	.045	.044	.035	.017	
	N	9	9	9	9	9	9	9	9

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Authors' own research

In table 4, we can see a correlation between emojis as well, between "sad" and "wow", "angry" and "love", but no significant correlation between these 4 emojis and the number of cases (confirmed, daily, recovered, asymptomatic or deaths).

Table 4. Correlations between reactions and data

		Confirmed Cases	Daily New Cases	Recovered	Deaths	Asymptomatics	Wow	Sad	Angry	Love
Confirmed Cases	Pearson Correlation	1	.601	.992**	.996**	.978**	-.465	-.593	-.451	-.571
	Sig. (2-tailed)		.087	.000	.000	.000	.207	.093	.223	.109
	N	9	9	9	9	9	9	9	9	9
Daily New Cases	Pearson Correlation	.601	1	.596	.600	.514	-.338	-.485	-.305	-.489
	Sig. (2-tailed)	.087		.090	.088	.157	.374	.185	.425	.181
	N	9	9	9	9	9	9	9	9	9
Recovered	Pearson Correlation	.992**	.596	1	.995**	.967**	-.369	-.519	-.362	-.499
	Sig. (2-tailed)	.000	.090		.000	.000	.329	.152	.338	.171
	N	9	9	9	9	9	9	9	9	9
Deaths	Pearson Correlation	.996**	.600	.995**	1	.969**	-.444	-.585	-.440	-.563
	Sig. (2-tailed)	.000	.088	.000		.000	.231	.098	.236	.114
	N	9	9	9	9	9	9	9	9	9
Asymptomatics	Pearson Correlation	.978**	.514	.967**	.969**	1	-.484	-.581	-.473	-.560
	Sig. (2-tailed)	.000	.157	.000	.000		.187	.101	.199	.117
	N	9	9	9	9	9	9	9	9	9
Wow	Pearson Correlation	-.465	-.338	-.369	-.444	-.484	1	.951**	.988**	.943**
	Sig. (2-tailed)	.207	.374	.329	.231	.187		.000	.000	.000
	N	9	9	9	9	9	9	9	9	9
Sad	Pearson Correlation	-.593	-.485	-.519	-.585	-.581	.951**	1	.961**	.998**
	Sig. (2-tailed)	.093	.185	.152	.098	.101	.000		.000	.000
	N	9	9	9	9	9	9	9	9	9
Angry	Pearson Correlation	-.451	-.305	-.362	-.440	-.473	.988**	.961**	1	.952**
	Sig. (2-tailed)	.223	.425	.338	.236	.199	.000	.000		.000
Love	Pearson Correlation	-.571	-.489	-.499	-.563	-.560	.943**	.998**	.952**	1
	Sig. (2-tailed)	.109	.181	.171	.114	.117	.000	.000	.000	
	N	9	9	9	9	9	9	9	9	9

**. Correlation is significant at the 0.01 level (2-tailed).

		Confirmed Cases	Daily New Cases	Recovered	Deaths	Asymptomatics	Comments	Shares
Confirmed Cases	Pearson Correlation	1	.601	.992**	.996**	.978**	-.450	-.560
	Sig. (2-tailed)		.087	.000	.000	.000	.225	.117
	N	9	9	9	9	9	9	9
Daily New Cases	Pearson Correlation	.601	1	.596	.600	.514	-.226	-.399
	Sig. (2-tailed)	.087		.090	.088	.157	.559	.287
	N	9	9	9	9	9	9	9
Recovered	Pearson Correlation	.992**	.596	1	.995**	.967**	-.355	-.471
	Sig. (2-tailed)	.000	.090		.000	.000	.349	.201
	N	9	9	9	9	9	9	9
Deaths	Pearson Correlation	.996**	.600	.995**	1	.969**	-.430	-.542
	Sig. (2-tailed)	.000	.088	.000		.000	.248	.132
	N	9	9	9	9	9	9	9
Asymptomatics	Pearson Correlation	.978**	.514	.967**	.969**	1	-.501	-.573
	Sig. (2-tailed)	.000	.157	.000	.000		.170	.107
	N	9	9	9	9	9	9	9
Comments	Pearson Correlation	-.450	-.226	-.355	-.430	-.501	1	.876**
	Sig. (2-tailed)	.225	.559	.349	.248	.170		.002
	N	9	9	9	9	9	9	9
Shares	Pearson Correlation	-.560	-.399	-.471	-.542	-.573	.876**	1
	Sig. (2-tailed)	.117	.287	.201	.132	.107	.002	
	N	9	9	9	9	9	9	9

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' own research

But we can see a positive correlation between the number of shares and the number of comments.

6. Conclusions

Starting with July 22nd, Romania has more than 1,000 new cases of COVID-19 affecting its population. Therefore, people are more concerned and try to keep themselves informed about the health situation. Our study focuses on the use of an Official source for updates, a Government Institution, posting daily on Facebook from a verified account. The day with the highest number of reactions from people was July 24th, with 1,100 comments and 3,100 likes. We have seen a large number of reactions and shares on July 21st as well, which could be explain by the fact that Romania was really close to reaching 1,000 new cases per day.

The limits of our study are the fact that the reactions of people could be correlated to other political declaration, but also with other posts on the page during the same day. Also, the numbers have been constantly changing while we were doing our research, people being even able to take back their reactions or to delete comments and shares. The number of shares is lower than expected (maximum 519) knowing that it is not only a verified and official source of information, but it is also the representation of health. A study has showed that people who want to self-promote themselves are the ones sharing the most unverified source of information (Islam et al., 2020).

In a next research, we would like to analyse the main aspects presented in the comments of people, correlating them with their reactions in terms of emojis as well as with their shares, in order to see the coherence between them and if they are related or not.

References

[1] Marshall, A. (2013). The Different Purposes of Social Media and SEO. Retrieved 07 15, 2020, from https://www.socialmediatoday.com/content/different-purposes-social-media-and-seo#.

[2] ABC 7 NEWS. (2020). Need a hug? Facebook releases new 'care' emoji reactions during COVID-19 outbreak. Retrieved 07 15, 2020, from https://abc7news.com/coronavirus-outbreak-pandemic-help/6145507/.

[3] Ahmed et al. (2020). COVID-19 and the 5G Conspiracy Theory: Social Network Analysis of Twitter Data. *J. Med. Internet Res.* 22 (5).

[4] Basch et al. (2020). News coverage of the COVID-19 pandemic: Missed opportunities to promote health sustaining behaviors. *Infection, Disease & Health*. 5(3), pp. 205-209.

[5] Bădilă, L. (2020). Stare de urgență în România? Iohannis a spus exact când va fi declanșată. Retrieved from https://www.capital.ro/stare-de-urgenta-in-romania-iohannis-a-spus-exact-cand-va-fi-declansata.html.

[6] Comarketing-News. (2020). Le rôle des réseaux sociaux pendant le confinement. Retrieved 07 10, 2020, from https://comarketing-news.fr/le-role-des-reseaux-sociaux-pendant-le-confinement/.

[7] Datta et al. (2020). The infodemics of COVID-19 amongst healthcare professionals in India. *Medical Journal armed Forces India*. 76 (3), pp. 276-283.

[8] Holmes, R. (2020). Is COVID-19 Social Media's Levelling Up Moment?

[9] Iacob, A. (2020). Revolut: Pe ce și cum își cheltuie românii banii în timpul pandemiei. Mai mulți bani pe jocuri, mai puțini pe ridesharing.

[10] Islam et al. (2020). Minsinformation sharing and social media fatigue during COVID-19: An affordance and cognitive load perspective. *Technological Forecasting & Social Change*, 159, 120201.

[11] Laguna et al. (2020). The impact of COVID-19 lockdown on food priorities. Results from a preliminary study using social media and an online survey with Spanish consumers. *Food and Quality Preference*, 86, 104028.

[12] LPCPON. (2017). L'utilisation des réseaux sociaux en communication publique. Retrieved 07 15, 2020, from http://cpon.infocom-nancy.fr/lutilisation-reseaux-sociaux-communication-publique/.

[13] Ministerul Sanatatii Romania. (2020). Comunicate de presa. Retrieved 07 14, 2020, from http://www.ms.ro/2020/05/15/buletin-informativ-15-05-2020/.

[14] Nabity-Grover et al. (2020). Inside out and outside in: How the COVID-19 pandemic affects self-disclosure on social media. *International Journal of Information Management*.

[15] United Nations. (2020). COVID-19 et réseaux sociaux : et si on prenait le temps de réfléchir ? Retrieved 07 05, 2020, from https://unric.org/fr/covid-19-et-reseaux-sociaux-et-si-on-prenait-le-temps-de-reflechir/.

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Consequences of Exits from Political Unions on Dividend Policy: The Case of Ethiopian Split

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Abstract

This paper examines the consequences of exits from political unions or the split of countries based on dividend policy decision, taking the Ethiopian split as a practical case, which is considered as a major factor in the increase of political tension with Eritrea especially after the secession, that led to the increase in successive political conflicts and dispute over the past years till now. This paper studies the impacts of political conflicts that have been companied with split to this day especially during the period (2010-2019), using a database of six companies from different sectors, from Ethiopia. The results show that the political conflicts, such as split, have a direct impact on the dividend policy.

Keywords: Dividend Policy; Political Exits; Ethiopian Split; Corporate Financial Policies.

JEL Classification: G30, G32, G34, G35, G38

1. Introduction

There is a significant correlation between politics, economics and the financial policy of any country. Gupta (2018) assures that economics and politics are co-determined, especially with regard to fiscal policy, where politics has a strong influence on the national economy and the fiscal policy of any country[15]. Moreover, Osterloh (2010) mentions that a country's political environment can affect its economic performance in several ways[21].

In recent years, we have witnessed the split of many countries around the world, the most important example of which was the split of South Sudan from Sudan in 2011, and Eritrea's split from Ethiopia in 1993 and recently the UK's exit from the European Union in 2020, which is known as Brexit. Acemoglu and Robinson (2012) mention that "States don't fail overnight. The seeds of their destruction are sown deep within their political institutions[1]." Usually, most of the separated states, which

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lived in a state of war and violence, face many challenges such as their inability to fully take advantage of the enormous potential of their society to grow, which makes citizens suffer from social and economic problems.

Many factors affect the financial system and its policies. However, this study deals with the impact of the political conflicts derived from the split between Ethiopia and Eritrea in 1993, which was considered as a major factor in the increase in the political tension between the two parties over the past years, which had a lot of consequences on the corporate finance policy, especially the dividend policy.

The rest of the paper is structured as follows: Chapter 2 describes the problem statement and its reasons and results; Chapter 3 expresses the research question and the aims of the study; then, Chapter 4 describes the research methods, including data and methodology; Chapter 5 shows the results and discussions of the study; Chapter 6 includes the conclusions and limitations.

2. Problem Statement

As for Eritrea's split from Ethiopia, the recent conflict is seen as relating to slices of disputed territories along the thousand kilometre border between the two countries, which were not demarcated correctly, more than a century ago by the Ethiopian Empire and Italy. According to Barry and Gilkes (2005), the origin of the dispute between the two parties was due to the differences between the Eritrean and Ethiopian leadership that started in the eighties. Although they both obtained the support of the same ethnic group, from similar peasant societies, and from Marxist ideology, they differed in their goals and aspirations. Therefore, the Popular Front for the Liberation of Eritrea decided that Eritrea would be liberated from Ethiopian rule as one unified country, despite being made up of nine language groups and two main religions, Islam and Christianity[4].

However, there are a lot of impacts of the Ethiopian split on the economic and financial policies. According to Devarajan et al. (2001), Ethiopia has entered into a protracted civil war along with a bold program to build a socialist economy. At the beginning of 1990, market-oriented reforms were launched in response to deep economic and political crises[9]. As a result of the civil war and internal conflicts, the local economy deteriorated and was significantly affected, especially after Eritrea's split from Ethiopia in 1993.

In addition, Nyasha et al. (2016) stated that although it is now known that the financial system consists of sectors based on banks, the market and companies, most of the previous studies focused on the relationship between economic growth and financial development in general[20]. This means that there is a historical relationship between economic growth and financial development, so any change in economic policy, the most important of which is political, may lead to an impact on the financial system that is based in turn on banks and companies.

In this context, many researchers carried out a lot of studies about the dividend policy and its theories. According to Frankfurter and Wood (2002), over the past five decades of this century, corporate dividend policy has gained much attention among economists as it has been the subject of extensive theoretical modelling and empirical

examination. Three schools of thought have emerged over the past century[13]. The first point of view adopts the idea that stock dividends are attractive and have a positive effect on price stocks[7], Boyte-White (2020); Allen and Rachim (1996)[2]. The second group believes that share prices are negatively correlated to dividend payout[18] as Nguyen et al. (2019) and Asghar et al. (2011) mentioned[3]. The third block of theories confirms that the dividend policy is not related to the evaluation of the share price[5], as Baskin (1989) demonstrated.

In this paper, we address the issue of the impact of political exits on the corporate financial policies, especially the dividend policy, taking the Ethiopian split as a practical case, through studying the determinants of the dividend policy during a period of political conflicts between the two parties and noticing the changes resulted from it. While other articles just mention the impact of politics on the economy and financial policies in general.

3. Research Questions / Aims of the Research

A political decision such as exits from political unions or the split of countries often has many implications on the economic and financial policy[21], Osterloh (2010). However, the question remains, do political decisions affect the corporate finance policy, and to what extent this may affect the firm's dividend policy?

There are many studies that investigate about the impact of the politics on the dividend policies. For example, Lei (2015) addressed how the political uncertainty and political decisions can affect the firm's dividend decisions by mentioning that corporate behaviour is subject to the political environment[17]. Moreover, North and Thomas (1973) study many countries that witnessed dramatic changes in recent decades, especially that suffered from civil war and political conflicts. Political uncertainty, such as splits or conflicts, is an important political factor that may influence corporate decision-making, especially the dividend policy[19]. In addition, Farooq and Ahmed (2019) study the relation between the politics and dividend policy, and the impacts of political decisions on the pay-out policies where they stated that the corporate dividend policies are linked to the political systems[11].

Tested Hypothesis:

There are some authors who consider that politics have a weak impact on corporate financial policy, especially on the dividend policy, as they depend on the principle that these issues are internal issues decided by firms, as it is not possible to determine whether there is a direct impact of politics on the dividend policy or not even in case that there is a limited impact. According to Feltri et al. (2017); Roe & Siegel (2011) until the past two and a half decades, finance researchers did not pay much attention to political economy until the impact of politics on the economy began to emerge[12]. At that time, analysts didn't study the impact of politics on the economy, especially the performance of companies and their policies, thinking that there was no close relationship between them[23]. Moreover, Faccio (2006) mentions that the impact of political ties depends mostly on the level of economic development of the country, where the impact varies from one country to another[10].

H0: The Ethiopian split has no impact on the dividend policy.

On the other hand, there are many researchers who believe that politics has a direct impact on economic and financial policies, especially the dividend policy. According to Julio & Yook (2012), they assure that a lot of research and debate on the relationship between politics and economic outcomes has a long history. According to them, governmental decisions and national leadership policy have a lot of implications on the behaviour of all companies and financial policy[16]. Moreover, Lei et al. (2015) mention that the cash dividend policy is one of the major corporate financial decisions that are influenced by political factors[17]. In addition, Frederikslust et al. (2008), mention that the perceived excess of the 1980s produced a major regulation of US financial markets that affects the control market, credit markets, and the market structure. These changes have highlighted the impacts of the political environment on financial policies[14].

H1: The Ethiopian split has a direct impact on the dividend policy.

4. Research Methods

This study depends on financial indicators and variables collected from six companies in Ethiopia from different sectors during the period (2010-2019), which reflect a period of political conflicts and instability between Ethiopia and Eritrea that resulted from the beginning of the split between Ethiopia and Eritrea in 1993 till now, where a regression analysis was applied to analyse and interpret the financial data for the firms, in order to notice the impact of the split and the political conflicts on the corporate financial policies, especially the dividend policy, by noticing how much the political decisions affect the variables and how did they change by addressing the variation in the ratios of the variables during this period.

In order to study the indicators and variables of the dividend policy, it has to be mentioned the determinants of the dividend pay-out that were used in this study, where dividend per share was used as a dependent variable since it is an important metric for the dividend policy, and the independent variables are as follows: leverage, profitability, liquidity and size. Several studies used dividend per share as dependent variable to study the determinants of the dividend policy, such as Bostanci et al. (2018), who analyse the factors that affect the dividend pay-out decisions of the companies[6]. In addition to Chauhan et al. (2019), Porwal & Singh (2018) carried out several studies about the determinants of the dividend policy[8].

Table 1 shows the variables, symbols and their proxies, which are related to the determinants of the dividend policy for the firms.

Table 1. Variables, symbol, proxies and variable type

Variable	Symbol	Proxy	Variable Type
Dividend per Share	DPS	Dividend Paid/Shares Outstanding	Dependent
Leverage	LEV	Total Debt/Total Asset	Independent
Profitability	PROF	Net Income/Total Asset	Independent
Liquidity	LIQ	Current Asset/Current Liability	Independent
Size	Sz	Natural Log (Total Assets)	Independent

This study addresses the firm's specific determinants of dividend policy for six companies from Ethiopia during the period (2010-2019). We obtained all data from annual reports of the companies from their official websites and some data from scientific websites. Therefore, this sample includes six well-known firms from different sectors such as "Ethiopian Air, NBE, Harar Brewery, SAP, Nestle in Ethiopia, NICE''. The sample consists of different indicators of dividend policy, of the six firms, over a period of ten years, which makes 60 firm-year observations.

Since we have panel data and time series format which includes both cross section and time dimension, we will adopt regression as econometric analysis. Therefore, the empirical expression of the main model in Table 1 is as in Eq. (1). In this model, *i* corresponds to the number of firms and *t* corresponds to the year.

$$DPS_{it} = \beta_0 + \beta_1 Lev_{it} + \beta_2 Prof_{it} + \beta_3 Liq_{it} + \beta_4 Sz_{it} + \varepsilon_{it} \quad (1)$$

According to the above model, we obtain the following equation, where in Eq. 1 the dependent variable is the dividend per share, where leverage, profitability, liquidity and size are the independent variables, *i* represents each company, *t* represents the year, β_0 represents the constant coefficient, where β_1, β_2, β_3 & β_4 represents the coefficients of the independent variables.

5. Findings

After examining the variables, indicators and the regression model, table 2 indicates the descriptive statistics for proxies using the regression analysis in order to understand the consequences of the Ethiopian split and political exits on the corporate financial policies, through analysing the variables of the dividend policy during the period (2010-2019).

Table 2. Descriptive statistics

		DPS	Leverage	Profitability	Liquidity	Size
N	Valid	60	60	60	60	60
	Missing	0	0	0	0	0
Mean		1.4435	.5103	.4177	.9230	9.4548
Median		1.6100	.5100	.4050	.8800	10.3700
Std. Deviation		.59183	.09877	.16736	.23308	1.98912
Skewness		-.316	.247	.361	.653	-.257
Std. Error of Skewness		.309	.309	.309	.309	.309
Kurtosis		-1.273	.345	-1.033	-.432	-1.627
Std. Error of Kurtosis		.608	.608	.608	.608	.608
Range		1.95	.47	.58	.94	6.33
Minimum		.40	.29	.18	.56	6.12
Maximum		2.35	.76	.76	1.50	12.45

Source: SPSS Software, 2020

The descriptive statistics of table 2 shows that the average of DPS for the firms in Ethiopia was 1.44 per share. The average of the leverage was 51%, where the average of the profitability is around 41.7%. However, the average of liquidity was about 0.92. We also notice that the average size of the companies was 9.45 when measured using the logarithm of the total assets.

After examining the descriptive statistics, next we interpreted the results of the correlations below between the variables over the period (2010-2019).

Table 3. Correlations

		DPS	Leverage	Profitability	Liquidity	Size
DPS	Pearson Correlation	1	.471**	.559**	-.299*	.720**
	Sig. (2-tailed)		.000	.000	.020	.000
	N	60	60	60	60	60
Leverage	Pearson Correlation	.471**	1	.247	-.319*	.475**
	Sig. (2-tailed)	.000		.057	.013	.000
	N	60	60	60	60	60
Profitability	Pearson Correlation	.559**	.247	1	-.255*	.248
	Sig. (2-tailed)	.000	.057		.050	.056
	N	60	60	60	60	60
Liquidity	Pearson Correlation	-.299*	-.319*	-.255*	1	-.158
	Sig. (2-tailed)	.020	.013	.050		.228
	N	60	60	60	60	60
Size	Pearson Correlation	.720**	.475**	.248	-.158	1
	Sig. (2-tailed)	.000	.000	.056	.228	
	N	60	60	60	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

In this part, the most important factor is the Pearson correlation, where this factor decides whether if there is a positive or negative relationship between the variables, where the value always between [-1 & +1]. While if the value is zero or near to zero, there is no relationship. If we look at the Pearson correlation, we can notice that variables such as leverage, profitability and size have a positive relationship with DPS. While liquidity has a negative relationship with DPS.

So, if we want to analyse the relationship between the variables, we will find that there is a strong relationship between the variables, whether positive or negative.

Table 4 shows the correlation coefficient between the dependent variable and the independent variables, for equation 1 during the period (2010-2019).

Table 4. The correlation coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.759	.384		-1.975	.053
	Leverage	.459	.538	.077	.854	.397
	Profitability	1.324	.284	.375	4.663	.000
	Liquidity	-.224	.206	-.088	-1.089	.281
	Size	.172	.026	.576	6.637	.000

a. Dependent Variable: DPS = Dividend Paid / Shares Outstanding

According to the above table, we can notice that profitability and size have a Sig = 0.000 < 0.05; so, these two variables have the most efficiency on the dependent variable (DPS). After applying the correlation coefficient, we can extract the value of the variables in the model, at the below equation.

According to the correlation model, we will obtain the following equation:

Equation (1): DPS_{it}= -.759 + .459 + 1.324 + (-.224) + .172 + ε it

Table 5 shows the regression analysis results according to the hypothesis.

Table 5. The regression analysis results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.189	4	3.547	30.127	.000[b]
	Residual	6.476	55	.118		
	Total	20.665	59			

a. Dependent Variable: DPS= Dividend Paid / Shares Outstanding

b. Predictors: (Constant), Size, Liquidity, Profitability, Leverage

$\alpha = 0.000 < 0.05$ or 5% → There is a low probability that H0 is true, so we reject H0; [H0: not significant; H1: significant].

6. Conclusions

This paper examines the impacts of the political conflicts in Ethiopia on the corporate financial policies, especially the dividend policy. The political conflicts and the internal fighting resulted from the split between Ethiopia and Eritrea in 1993 to the present day have had many consequences on the two countries, especially the performance of the companies operating there.

A regression analysis was adopted to study the impact of political conflicts on the dividend policy determinants. Our results show that profitability and size are significant determinants of the DPS while leverage, liquidity are not significantly affecting the DPS. Besides, we found that liquidity is negatively associated with DPS. However, leverage, profitability and size have a positive relationship with DPS.

Finally, it is clear that the impact of the split and the political issues differ from one company to another, and this is the case with regard to the variables of the dividend policy. As the impact of political conflicts varies depending on the variables, this assures that the political issues between Ethiopia and Eritrea have a lot of impact on the corporate financial policy, fact that supports the H1 Hypothesis.

This paper has two main limitations. Firstly, this paper required a lot of time and effort due to the lack of data for many companies. Secondly, the study excludes firms missing data on the variables between years 2010 and 2019.

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References

[1] Acemoglu, D., & Robinson, J. (2012). 10 Reasons Countries Fall Apart. Retrieved from https://foreignpolicy.com/2012/06/18/10-reasons-countries-fall-apart/.

[2] Allen, D., & Rachim, V. (1996). Dividend policy and stock price volatility: Australian evidence. *Journal of Applied Financial Economics*, 6(2), pp. 175-188. Retrieved from https://www.tandfonline.com/doi/abs/10.1080/096031096334402?journalCode=rafe20

[3] Asghar, M., & Shah, S., & Hamid, K., & Suleman, M. (2011). Impact of Dividend Policy on Stock Price Risk: Empirical Evidence from Equity Market of Pakistan. Far East *Journal of Psychology and Business*, 4(1), pp. 45-52. Retrieved from https://www.researchgate.net/publication/227436441_Impact_of_Dividend_Policy_on_Stock_Price_Risk_Empirical_Evidence_from_Equity_Market_of_Pakistan.

[4] Barry, T., & Gilkes, P. (2005). The War Between Ethiopia and Eritrea. *Institute for Policy Studies.* Retrieved from https://ips-dc.org/the_war_between_ethiopia_and_eritrea/.

[5] Baskin, J. (1989). Dividend policy and the volatility of common stocks. *The Journal of Portfolio Management*, 15(3), pp. 19-25. Retrieved from https://jpm.pm-research.com/content/15/3/19.

[6] Bostanci, F., & Kadioglu, E., & Sayilgan, G. (2018). Determinants of Dividend Payout Decisions: A Dynamic Panel Data Analysis of Turkish Stock Market. *International Journal of Financial Studies.* Retrieved from https://www.mdpi.com/2227-7072/6/4/93/pdf.

[7] Boyte-White, C. (2020). How Dividends Affect Stock Prices. *Investopedia.* Retrieved from https://www.investopedia.com/articles/investing/091015/how-dividends-affect-stock-prices.asp.

[8] Chauhan, J., & Ansari, M., & Taqi, M., & Ajmal, M. (2019). Dividend Policy and Its Impact on Performance of Indian Information Technology Companies. *International Journal of Finance and Accounting*, 8(1), pp. 36-42. Retrieved from http://www.sapub.org/global/showpaperpdf.aspx?doi=10.5923/j.ijfa.20190801.03.

[9] Devarajan, S., & Dollar, D., & Holmgren, T. (2001). Aid and Reform in Africa: Lessons from Ten Case Studies. Washington, DC: *World Bank*. Retrieved from https://openknowledge.worldbank.org/handle/10986/13894?locale-attribute=es.

[10] Faccio, M. (2006). Politically connected firms. *Journal of American Economic Review*, 96(1), pp. 369-386. Retrieved from https://www.aeaweb.org/articles?id=10.1257/000282806776157704.

[11] Farooq, O., & Ahmed, N. (2019). Dividend Policy and Political Uncertainty: Evidence from The US Presidential Elections. *Journal of Research in International Business and Finance*, 48(1), pp. 201-209. Retrieved from https://doi.org/10.1016/j.ribaf.2019.01.003.

[12] Feltri, S., & McLean, B., & Rolnik, G., & Schechter, A., & Zingales, L. (2017). To What Extent Do Political Considerations Affect Finance? Retrieved from https://promarket.org/extent-political-considerations-affect-finance/.

[13] Frankfurter, G., & Wood, Jr. B. (2002). Dividend Policy Theories and Their Empirical Tests. *Journal of International Review of Financial Analysis*, 11(2), pp. 111-138. Retrieved from https://doi.org/10.1016/S1057-5219(02)00071-6.

[14] Frederikslust, R., & Ang, J., & Sudarsanam, P. S. (2008). Corporate Governance and Corporate Finance: A European Perspective. Retrieved from https://books.google.com.lb/

books?id=zx99AgAAQBAJ&dq=no+relation+between+politics+and+corporate+finance&hl=ar.

[15] Gupta, S. (2018). Politics of Fiscal Policy: What do we know. *Regional Fiscal Policy Seminar 2018*. Retrieved from https://www.cgdev.org/sites/default/files/gupta-politics-of-fiscal-policy-presentation.pdf.

[16] Julio, B., & Yook, Y. (2012). Political Uncertainty and Corporate Investment Cycles. *The Journal of Finance*, 67(1). Retrieved from https://doi.org/10.1111/j.1540-6261.2011.01707.x.

[17] Lei, G., & Wang, W., & Liu, M. (2015). Political Uncertainty, Dividend Policy Adjustments and Market Effects. *China Journal of Accounting Studies*, 3(1), pp. 49-83. Retrieved from https://doi.org/10.1080/21697213.2015.1015370.

[18] Nguyen, D., & Bui, M., & Do, D. (2019). The Relationship Of Dividend Policy and Share Price Volatility: A Case in Vietnam. *Journal of Economics and Finance*, 20(1), pp. 123-136. Retrieved from http://aeconf.com/Articles/May2019/aef200105.pdf.

[19] North, D., & Thomas, R. (1973). The Rise of the Western World: A New Economic History. 1st ed. *Cambridge University Press*, United Kingdom. Retrieved from https://books.google.com.lb/books?id=MEh_54ldK8C&printsec=frontcover&hl=ar&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false.

[20] Nyasha, S., & Gwenhure, Y., & Odhiambo, N. (2016). Financial Development and Economic Growth in Ethiopia: A Dynamic Causal Linkage. *UNISA Economic Research Working Paper Series.* Retrieved from https://www.researchgate.net/publication/303311489_Financial_Development_And_Economic_Growth_In_Ethiopia_A_Dynamic_Causal_Linkage.

[21] Osterloh, S. (2010). The Impact of Politics on Economic Performance. Centre for European Economic Research. Retrieved from http://ftp.zew.de/pub/zew-docs/dp/dp10092.pdf.

[22] Porwal, H., & Singh, R. (2018). Determinants of Dividend Policy. *International Journal of Management Studies*, 5(4). Retrieved from http://dx.doi.org/10.18843/ijms/v5i4(6)/02.

[23] Roe, M., & Siegel, J. (2011). Political Instability: Its Effects on Financial Development, Its Roots in the Severity of Economic Inequality. *Journal of Comparative Economics*, 39(1), pp. 279-309. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=963214.

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On Random Walk Hypothesis. A Short Test for the Bucharest Stock Exchange

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Abstract

In this paper we present a short test on the random walk hypothesis, by using as database a sample of companies listed on the Bucharest Stock Exchange, namely the BET companies and the financial companies that form the BET-FI stock index. The analysis uses as entry data stock prices and return series, because both of these indicators encapsulate market evolution. Random walk is a condition for weak informational efficiency, therefore the results may be used in further studies on the Romanian capital market efficiency. They may constitute intermediary results or simply may influence ideas on further testing of market efficiency. Results are discussed at the end of the paper and are included in the conclusion section.

Keywords: informational efficiency, random walk, stock price series, return series, weak form efficiency, market efficiency.

JEL Classification: G19

1. Introduction

The current scientific idea of informational efficiency is one regarding the stock price informativeness, thus referring to how information is included in the stock prices. If all information is contained in stock prices, then the capital market is informationally efficient. This is, of course, the general idea. More specifically, there are three forms of informational efficiency, as defined by the great financial scientist Eugene Fama. There is: weak-form informational efficiency, semi-strong informational efficiency and strong informational efficiency. If the first form of efficiency is not detected for a capital market, then

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the other two need not be tested because they are non-existent in the absence of the first form.

One condition for weak-form informational efficiency is the random walk behaviour of market prices. This is the starting point, in our opinion. Scientific "opinion" may differ from country to country, geographical area to geographical area, or capital market to capital market. And let us not forget that finance is not an exact science. So, according to what we apply in this paper, the random walk characteristic is a fundamental condition that if not met, the entire concept of weak-form informational efficiency will be invalidated, thus no part of the concept of informational efficiency will apply for the capital market.

This paper is a short test of the random walk hypothesis or characteristic of stock price behaviour. The database is rather short, but can be expanded anytime in further studies. The utility of the paper is that of a research in the field of testing market efficiency, and the subsequent results can be used as intermediary results by other authors. One other aspect regarding practical utility of this paper stems from the unanimous idea that on an informationally efficient market, no abnormal profits can be earned by studying the stock price history. Therefore, the results are useful to investors or practitioners that envision earning high returns from the Bucharest Stock Exchange. The paper will offer a straight answer to this respect. It will not provide a mathematical model.

2. Problem Statement

Analyses on informational market efficiency were undertaken in a lot of previous studies. There are also quite a few studies that focus on the Romanian capital market. Our study is merely a short test applied on an updated database. The mathematical, statistical and econometrical methods used in our paper are of basic nature, and can be replicated easily by a large base of potential investors/researchers.

The foundations of the random walk model were laid by Louis Bachelier [1900]. This exceptional author is the one who, for the first time, used statistical analysis in the study of stock exchange prices (Bachelier, 1900). His work showed that past, present and even future events are reflected in the stock market price, but are usually not in visible relationship with price variations. Later, Maurice Kendall [1953] focused on the time series analysis and reached the conclusion that the stock market behaves randomly (Kendall, 1953).

The informational efficiency of the financial market can be expressed by a series of mathematical models. Such models are: the "fair game" model, the submartingale model and the random walk model. The basics for the "fair game" model were put by Fama [1970], when he showed (Fama, 1970) by mathematical equations that the most important consequence of informational efficiency, for a capital market, is the impossibility to obtain abnormal returns relative to the involved risk. The submartingale model states that no active trading strategy can generate a higher return than the passive buy and hold strategy. Finally, the random walk model, which was defined and tested by Fama and Miller [1972], states that

market prices reflect, instantaneously (Fama & Miller, 1972) (and fully), all available information regarding the traded stock; thus, successive variations of market prices are independent of each other, and the same is correct for market returns.

As stated in the previous section of the paper, there are three (Fama, 1965) main forms of informational efficiency for any capital market, according to a taxonomy introduced by the brilliant researcher Eugene Fama. The weak form of informational efficiency is met in the situation in which, on the capital market, asset prices reflect all their past history, fully and instantaneously. The past history includes: the market prices from the past, the variation in the prices, the volume of the transactions, etc. Consequently, there will be no correlation between the past variations and the future variations of the share prices; the price variations will be independent. This also implies that it is impossible to obtain abnormal earnings by studying the market price history.

3. Aims of the Research

Overall, this paper is about studying the weak form of informational efficiency on the Romanian market. Previous studies in this area show the Romanian capital market is not characterized by weak-form efficiency. This means that our market also lacks the other two forms of informational efficiency: the semi-strong (also called semi-weak) and strong form.

In our opinion, the pivotal study undertaken on the Romanian capital market is that of Dragotă and Mitrică [2003]. This paper uses standard econometric testing methodology and shows (Dragotă & Mitrică, 2003), at the end, that the Romanian capital market does not cumulate the conditions necessary for weak form informational efficiency. However, transaction costs and temporary lack of liquidity do not allow investors to gain abnormal returns.

Another important study (Todea, 2002) is one that tested the hypothesis of informational efficiency in the weak form, and was undertaken by Todea [2002]. The author used a sample of 10 BET index companies, listed on the BSE. The sample comprised 800 recordings from between the years 1997-2000. For 8 shares, the analysis confirmed that stochastic modelling is feasible. Thus, weak-form informational efficiency hypothesis is rejected.

Ten years later, Stănculescu and Mitrică [2012] studied the weak-form informational efficiency of the Romanian capital market and showed that market prices do not "walk" according to the random walk model (Stănculescu & Mitrică, 2012). Thus, the market lacks informational efficiency. The study sample includes the daily share prices of the 10 most liquid companies traded on the BSE regulated market. Present paper methodology is based mainly on this article.

However, a complex research (Dragotă et al., 2009) by Dragotă et al. [2009] concluded that the weak-form EMH cannot be rejected for the Romanian capital market. That is because for most of the stock prices, the random walk hypothesis could not be rejected. This study was based on multiple variance ratio test, assuming both homoskedasticity and heteroskedasticity.

There is more research undertaken on the Romanian market, but we finish our short survey with a recent study that is relevant to our paper's approach. Pașca [2015] tested the Romanian capital market efficiency by assessing basic statistical properties of market prices (Pașca, 2015). Ten of the most liquid stocks listed on the BSE were assessed. The conclusion was that weak-form informational efficiency cannot be generalized to the entire market, although some stocks had shown signs of informational efficiency.

4. Research Methods

The *database* of this study is not large. As stated in the paper title, this study is a "short" one. Nevertheless, we recommend the analysis to be continued and expanded with as many sample recordings as possible. To state a general idea, which in fact is a problem that hinders domestic scientific research, there is no public database, with a complete stock market history, available to the average investor or researcher. Gathering data is still a major issue today. One might wonder why an exhaustive stock price history is not available for immediate free download on the website of the Bucharest Stock Exchange. It's just a question.

To move on, we will explain how data was gathered for this study. We used the data[3] provided by investing.com website. By signing up for free, any online user is granted access to downloading the stock price history for any stock that is listed on the Romanian capital market[4]. Of course, other international capital markets may be accessed, too. The price history is not exhaustive, but it covers a lot of years and it generally starts with chronological recordings from around 2010. There is an average ten year period for data availability.

We chose to test random walk on the stock prices of the companies included in the BET index and the BET-FI (Bucharest SIF) index. The first index is comprised of 16 stocks and the second index includes 6 stocks. Therefore, a total number of 22 stocks, parted on two market indexes, are used in this analysis. As stated before, this study can be expanded. We encourage and recommend this endeavour.

For each of the analysed stock, a complete market recorded history (as provided by investing.com) consisting of daily prices, is gathered in a chronological fashion.

The research methodology is similar to the one described in Stănculescu and Mitrică [2012]. The starting point is the random walk model:

$$P_t = \rho \times P_{t-1} + \varepsilon_t \quad (1)$$

The elements of this relationship have the following significance: P is the stock price; t, t -1 are two successive moments in time; $\rho = 1$; ε_t is a regression error. P_t is a time series and ε_t is a random series (Stănculescu & Mitrică, 2012).

[3] www.investing.com - Markets – Stocks – Europe – Romania.

[4] We don't guarantee data availability, we are just describing how we accessed data on our own. Websites might restrict access anytime, according to their rules and policies.

The same idea applies for stock returns, which are in fact stock price variations. The distribution of the return variable, conditioned by the I_t information set, is identical to the unconditioned distribution of the same variable. Therefore, returns (return rates), same as price variations, manifest a random evolution in time (Dragotă et al., 2003), as the density function f ($R_{j,t+1}$) is the same, irrespective of the value taken by t:

$$f(R_{j,t+1} \mid I_t) = f(R_{j,t+1}) \quad (2)$$

To be precise, we will use two random walk tests: the Augmented Dickey-Fuller test and the Phillips-Perron test. They are generally called *unit root tests*.

The ADF test is based on assuming that the series of natural logarithms of daily share prices follow an AR (1) stochastic process, order 1 autoregressive:

$$\Delta \ln(P_t) = \mu + \varphi\, t + \gamma \times \ln(P_{t-1}) + \varepsilon_t \quad (3)$$

This is, in fact, a modified relationship, in which $\gamma = 1 - \rho$. The ADF involves performing a t-statistic test on the γ coefficient. The test results are to be compared with the critical values available for different levels of significance. Essentially, what is tested is the null hypothesis stating the stochastic series has a unit root:

$$H_0 \rightarrow \gamma = 0 \quad \Rightarrow\!\!\!> \quad \rho = 1 \quad (4)$$

The PP test provides an alternative to the ADF testing. It is a t-statistic for the coefficient of regression. It is in fact adjusted to remove errors (Stănculescu & Mitrică, 2012).

For both tests, computed numerical results are to be compared (Stănculescu & Mitrică, 2012) to the critical values obtained for the significance levels: 1%, 5%, and 10%. If the resulting values are higher than the critical values, for all significance levels, then the series would have a unit root. This will imply that the stock prices follow a random walk process.

The two tests are performed on the natural logarithms series of the stock prices recorded for the BET companies and the BET-FI companies. The results are synthesized in the next part of the paper.

5. Findings

The results performed by using the ***ADF procedure***, for the *BET indexed companies*, are presented in the following table:

Table 1. Augmented Dickey-Fuller testing for BET stocks

Share	ADF BET	1% critical value	5% critical value	10% critical value
ALR	-18.4657847556	-3.43389247529	-2.86299139357	-2.56758988872
TLV	-22.6740156472	-3.43340753751	-2.86277695834	-2.56747482236
BRD	-26.5258608073	-3.43193405813	-2.86212517502	-2.56712502501
BVB	-23.0847853231	-3.4328912795	-2.86254863358	-2.56735229402
TEL	-21.380801724	-3.433428591	-2.86278626877	-2.5674798185
COTE	-20.1483456189	-3.43440914542	-2.86321982052	-2.56771245431
DIGI	-16.1823411984	-3.43988141472	-2.86563666854	-2.56900869497
EL	-19.8551090521	-3.43486533872	-2.86342147559	-2.5678206476
FP	-19.0391558803	-3.43335218901	-2.86275248142	-2.56746168744
WINE	-11.4661680377	-3.44412819835	-2.86750913931	-2.57001227826
M	-14.9773242155	-3.43881901235	-2.86516781263	-2.56875730966
SNP	-22.0810034382	-3.43339951254	-2.86277340947	-2.56747291795
SNN	-18.3124345824	-3.43438988933	-2.86321130789	-2.56770788689
SNG	-16.3503405011	-3.43440914542	-2.86321982052	-2.56771245431
TGN	-21.262819315	-3.43340914731	-2.86277767025	-2.56747520439
SFG	-15.7767750794	-3.44267334751	-2.86686797977	-2.56966870494

Source: own processing

As one can notice, the ADF value is smaller than all critical values, for any level of significance: 1%, 5% and 10%. Thus, the test rejects the null hypothesis which states the natural logarithms stock price series has a unit root. This proves the series does not follow any random walk sort of stochastic process.

The results performed by using the ***ADF procedure***, for the *BET-FI indexed companies*, are included in the following table:

Table 2. Augmented Dickey-Fuller testing for BET-FI stocks

Share	ADF BET-FI	1% critical value	5% critical value	10% critical value
FP	-19.0391558803	-3.43335218901	-2.86275248142	-2.56746168744
SIF3	-22.8336283178	-3.43192133436	-2.86211954529	-2.5671220033
SIF4	-18.0354522978	-3.43343022188	-2.86278698999	-2.56748020553
SIF2	-20.2523010113	-3.43342696174	-2.86278554828	-2.56747943187
SIF5	-18.232297777	-3.43341722047	-2.86278124043	-2.5674771202
SIF1	-17.5027088492	-3.43343022188	-2.86278698999	-2.56748020553

Source: own processing

As it may be noticed, the ADF value is smaller than all critical values, for any level of significance: 1%, 5% and 10%. This implies that the test rejects the null hypothesis which states that the natural logarithms stock price series has a unit root. This proves the series does not follow any random walk sort of stochastic process.

The results performed by using the ***PP procedure***, for the *BET indexed companies*, are included in the following table:

Table 3. Phillips-Perron testing for BET stocks

Share	PP BET	1% critical value	5% critical value	10% critical value
ALR	-47.1216884796	-3.43385662876	-2.86297554379	-2.56758138399
TLV	-44.1423933143	-3.43338675533	-2.86276776784	-2.56746989049
BRD	-56.7756762931	-3.43192602526	-2.86212162081	-2.56712311736
BVB	-50.1642489184	-3.43287548013	-2.86254164537	-2.56734854372
TEL	-42.9539991017	-3.43340432272	-2.86277553668	-2.56747405946
COTE	-45.2772907755	-3.43437624204	-2.86320527472	-2.56770464987
DIGI	-26.3409302548	-3.43976639667	-2.86558591744	-2.5689814857
EL	-40.8184131732	-3.43482498395	-2.86340363851	-2.56781107778
FP	-45.7440866863	-3.43332140588	-2.8627388679	-2.5674543821
WINE	-26.7134297219	-3.44377635142	-2.86735410785	-2.56992920914
M	-35.4028895063	-3.43869394286	-2.86511260607	-2.56872770722
SNP	-46.5692564885	-3.43337883332	-2.86276426447	-2.56746801054
SNN	-36.2274676845	-3.43434921133	-2.86319332496	-2.56769823821
SNG	-39.5155886951	-3.43435458956	-2.86319570259	-2.56769951394
TGN	-42.9619221037	-3.43338834445	-2.8627684706	-2.5674702676
SFG	-24.1538165605	-3.44253021898	-2.86680488518	-2.56963489116

Source: own processing

As one can notice, the PP value is smaller than all critical values, for any level of significance: 1%, 5% and 10%. As a consequence, the test rejects the null hypothesis which states that the natural logarithms stock price series has a unit root. This proves the series does not follow any random walk stochastic process.

The results performed by using the ***PP procedure***, for the *BET-FI indexed companies*, are included in the following table:

Table 4. Phillips-Perron testing for BET-FI stocks

Share	PP BET-FI	1% critical value	5% critical value	10% critical value
FP	-45.7440866863	-3.43332140588	-2.8627388679	-2.5674543821
SIF3	-55.6580242885	-3.4319111027	-2.86211501818	-2.5671195735
SIF4	-45.7403456618	-3.43339791234	-2.86277270181	-2.5674725382
SIF2	-49.249743147	-3.43339152741	-2.86276987821	-2.56747102299
SIF5	-44.0450480466	-3.43338199742	-2.86276566374	-2.56746876144
SIF1	-44.3787762392	-3.4333947167	-2.86277128861	-2.56747177984

Source: own processing

As it may be noticed, the PP value is smaller than all critical values, for any significance level: 1%, 5% and 10%. This implies the test will reject the null hypothesis which states the natural logarithms stock price series has a unit root. This shows the series does not follow any random walk stochastic process.

6. Conclusions

In conclusion, the capital market is non-efficient in the weak form. Of course, this is an extrapolation. We did not test all stocks traded on the Bucharest Stock Exchange. But for the ones that we did test, the random walk hypothesis was rejected. Thus, no random walk, no weak-form informational efficiency. It is quite relevant that for 22 listed companies, the stock prices do not follow a random walk stochastic process. Therefore, without providing any mathematical prediction model, we cannot exclude the fact, as proven by this paper, that abnormal returns can be gained by means of studying the stock price history, at the BSE.

References

[1] Bachelier, L. (1900). *Théorie de la spéculation*, Paris: Gauthier – Villars.

[2] Dragotă, V. (coord.), Dragotă, M., Dămian, O., & Mitrică, E. (2003). *Gestiunea portofoliului de valori mobiliare*, Editura Economică, Bucureşti.

[3] Dragotă, V., & Mitrică, E. (2003). Emergent capital markets' efficiency: the case of Romania, *European Journal of Operational Research*.

[4] Dragotă, V., Stoian, A., Pele, D. T., Mitrică, E., & Bensafta, M. (2009). The development of the Romanian capital market: evidences on information efficiency, *Romanian Journal of Economic Forecasting*, 6(2), pp. 147-160.

[5] Fama, E. (1970). Efficient capital markets: a review of theory and empirical work, *Journal of Finance*, 25, May, pp. 383-417.

[6] Fama, E. (1965). The behavior of stock market prices, *Journal of Business*, 38, January.

[7] Fama, E., & Miller, M. (1972). *The Theory of Finance*, Holt Rinehart & Winston, June.

[8] Kendall, M. G. (1953). The analysis of economic time – series, part I: prices, *Journal of the Royal Statistical Society*, 96.

[9] Pașca, L. (2015). Testing the weak-form efficiency of the Romanian capital market by assessing the random walk-like behaviour of stock prices, *Annals of the „Constantin Brâncuşi" University of Târgu Jiu, Economy Series*, 2, pp. 264-269.

[10] Stănculescu, A., & Mitrică, E. (2012). Testing weak form informational efficiency on the Romanian capital market, *Theoretical and Applied Economics*, 19, pp. 29-36.

[11] Todea, A. (2002). Teoria pieţelor eficiente şi analiza tehnică: cazul pieţei româneşti, *Studia Universitatis Babeş-Bolyai. Oeconomica*.

[12] www.bvb.ro.

[13] www.investing.com.

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Financial Literacy, Risk Aversion and Financial Behaviours: What Shapes the Preference for Capital Market Participation?

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Abstract

This paper aims at examining the role played by financial literacy, risk aversion and financial behaviours in shaping young individuals' preference for making investments in traditional assets of the Romanian capital market. For this purpose, we conducted a survey among the students enrolled in the finance and banking oriented faculty at the largest university of economic studies in Romania. The questionnaire comprises 40 questions that assess respondents' general social and demographic background, financial behaviours, risk aversion, basic and advanced financial literacy. For this study, we used a sample of 416 Romanian nationality respondents. We employed an ordered logistic model in order to examine what drives young people's preference for capital market investments. The estimates indicate that financial literacy plays an important role in stimulating their propensity to invest in the capital market. Risk aversion prevails in the case of individuals with only basic financial literacy and reduces their preference for a more diversified portfolio. If young people face difficulties in satisfying their desires, they will not be inclined to invest in the capital market.

Keywords: financial literacy, risk aversion, financial behaviour, stock market, survey, logit model.

JEL Classification: D14, G4, G53

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1. Introduction

The experience of the recent financial crisis proves that poor financial decisions are a phenomenon that is surprisingly widespread throughout the world. Can individuals effectively manage their own finances? Do public policies play a role in helping consumers to improve the results of their financial decisions? Even simple decisions regarding saving and investing require individuals to forecast and collect certain variables such as interest rates, inflation, financial products and to understand concepts such as compounding interest and time value of money (Lusardi, 2008).

The responsibility of ensuring financial well-being falls to households. They have to acquire and manage financial expertise in order to be able to make informed saving and investment decisions. As, in order to drive a car on public roads, it is compulsory for the individual to hold a driving license, similarly, the adoption of investment decisions should be possible after acquiring a "financial license", as the errors regarding the financial decisions can have serious consequences on individuals and society as a whole.

The fact of having a minimum level of financial knowledge and skills that are confined to the concept of *financial literacy*, acquired or not through the financial education process, supports the efficient management of individuals' financial resources. Most studies in the literature suggest that individuals who have a low level of financial knowledge tend to make decisions that are not favourable to them. Generally, they avoid making investments that involve participation in financial markets and hold less diversified portfolios. In a changing world, financial products are becoming more and more complicated, which means that people should consider systematic financial training, be constantly informed about the latest news in the field of financial products so that they can be successful in the decisions they make.

2. Problem Statement

For the financial markets, the deep and broad participation of households represents an important determinant for the risk premium, market volatility and household expenses. Cole and Shastry (2009) consider the participation in the US stock market to be modest: 17.6% of households hold bonds and 20.7% of them hold shares. For comparison, in 2017, only 58% of Romanians had a bank account; in 2013, bank deposits were the most important financial instrument (although they represented only 31% of GDP compared to developed countries where they represented 84% of GDP), while an insignificant percentage of Romanians invested their money in shares, bonds or mutual funds (Demirguc-Kunt, Hu and Klapper, 2019; Beckmann, 2013). Recently, according to the 2018 Investor Compensation Fund in Romania Annual Report, the total number of investors was only 53,891 persons in December 2018, decreasing by 9.23% compared to December 2017 and by 27.6% compared to December 2014. The average portfolio of a fully compensable investor (with holdings of up to EUR 20,000) was EUR

3,458 (the equivalent of less than 4 average wages in Romania) in December 2018. The number of members such as authorized intermediaries to provide financial investment services has been steadily decreasing (from 104 in 2008 to 51 in 2014, 37 in 2017 and 31 in 2018), due to the poor performance or losses. This has negatively affected the number of investors, reflecting the unfavourable evolution of the Romanian capital market.

Griffins and Messy (2012) and Zou and Deng (2019) suggested that the increasing degree of financial literacy, both at the individual and at the country level, is essential for ensuring the increase in the participation rate of the individual investors in the capital market. Acquiring financial skills will allow individuals to make better decisions, which will ultimately have favourable effects on financial markets and on the economy as a whole.

3. Research Questions / Aims of the Research

In the light of the above, the aim of our study is to examine the impact of financial literacy on the young people's preference for the shares and bonds traded in the Romanian capital market. We also examine the extent to which risk aversion and financial behaviours influence their investment preference. One contribution of our paper is that the analysis takes into account the students enrolled in the finance and banking oriented faculty at the largest university of economic studies in Romania. As Shim et al. (2010) stated, students are going through an important transition period in their personal development. They are not yet completely financially independent, but they are actively learning the skills needed to become financially independent and enter the maturity phase of their lives, and the financial habits they acquire during this period are likely to influence greatly their future financial well-being. A second contribution is that our study is the first attempt in analysing what shapes young people's preference for capital market investments in a former communist economy. Our methodological and modelling approaches may serve as guidance for future related studies developed on post-communist economies.

4. Research Methods

For the purposes of this study, we firstly conducted a survey based on a questionnaire, which comprises 40 questions and is organized in six parts. We were interested in: collecting information on the respondents and respondents' parents financial behaviours; assessing respondents' financial literacy and risk aversion; finding out their preference for a number of financial products (cash, saving accounts, life insurance, mutual funds, stocks, pension funds, bonds and current accounts). In order to assess the financial literacy, we used a set of 16 standard questions proposed by Lusardi and Mitchell (2014) and van Rooij, Lusardi and Alessie (2011). Five questions addressed basic financial literacy skills, such as numerical skills, the ability to make interest rate calculations, the understanding of inflation and risk diversification. Eleven questions addressed advanced financial

knowledge about the most popular financial assets, stocks, and bonds, mutual funds, the risk and return associated with financial assets, the functioning of the capital market in general. We employed an experimental method proposed by Hartog, Ferrer-i-Carbonell and Jonker (2000) to evaluate the risk aversion based on the absolute risk aversion coefficient (ARA) introduced by Arrow (1965) and Pratt (1964). Our sample included 416 under and post-graduate students aged between 18 and 23.

In order to examine what factors shape young educated people's preference for capital market investments, we employ an ordered logistic regression. The dependent variable is a dummy variable that takes 0, if the respondents selected neither shares nor bonds from the list of the financial products; 1, if the respondents selected at least one of the two assets; and 2, if the respondents selected both financial assets. Equation (1) describes the model:

$$\Pr\left(Y = 1 \;/Literacy, Risk, Z_i\right) = F(\beta_0 + \beta_1 \cdot Literacy + \beta_2 \cdot Risk + \sum_{i=1}^{N} \varphi_i \cdot Z_i) \qquad (1)$$

where: Y is the dependent variable; *Literacy* is an explanatory variable and represents respondents' total financial literacy score. We also estimate logit models that include the basic (*Basic*) and the advanced (*Advanced*) financial literacy scores; *Risk* is an explanatory variable that measures the respondents' risk aversion; Z_i is a set of control variables that takes into account socio, demographic, and financial behaviours; $\beta_0, \beta_1, \beta_2, \varphi_i$ are the coefficients to be estimated.

For the selection of the control variables, we calculated the correlation matrix and dropped out from the logistic models those factors that were strongly correlated with the financial literacy and risk aversion.

5. Findings

Examining the correlation coefficients (see Table 1), we found that the young people's preference for shares can be positively influenced by the extracurricular financial education training which they attended voluntarily before the university studies and by the financial literacy score. Also, respondents who have demonstrated fiscal literacy appear to be more prone to invest in shares. Having a job can also stimulate their preference for shares as well as the household income. We note that household income can be a proxy for the young people's future earnings. Parents' university education and father's professional status as employee in the private sector can positively influence children's preference for investing in shares. If they base their financial decisions on parents' similar past experiences, their preference for shares investment decreases. We noticed a great similarity between the parents' financial habits and those of children. Parents mostly passed on their financial behaviour to their children characterized by a preoccupation for the budgetary discipline, regularly tracking the expenses, meeting the budget constraint and less for saving and investments. If the respondents face difficulties in purchasing the desired goods, their preference towards shares will diminish.

Regarding the preference for bonds, the factors that can influence it are less numerous than those identified in the case of shares. This is because, on the one

hand, the number of respondents who indicated the possibility to invest in bonds is about 20%, representing half of those who have expressed preferences for shares. On the other hand, as shown by the advanced financial literacy questions, the respondents proved a greater unfamiliarity of this financial product. Thus, having a job positively influences the preference for bonds. If parents discuss financial issues with their children, they will be more prone to invest in bonds. The father's university education might shape the children's preference for bonds, as well as the mother and father's professional status as entrepreneurs. In contrast, if the father is a civil servant, the preference for bonds will tend to decrease.

Table 1. Correlation matrix

Control variables	Stocks	Bonds	Literacy	Basic	Advanced	Risk
Extra financial education	0.1408*	0.0356	0.0948***	0.0621	0.0938***	0.0026
Employee	0.1491*	0.2172*	0.3168*	0.3183*	0.1985*	0.0763
Discussions on financial matters	0.0744	0.1459*	0.2410*	0.1965*	0.2333*	0.0376
Financial decisions based on parents' experiences	-0.0858***	-0.0572	-0.1219**	-0.0934***	-0.1131**	0.0742
Difficulties in purchasing desired goods	-0.0848***	-0.0754	0.0245	-0.0151	0.0414	0.0950***
Financial investments	0.0827***	0.0232	0.0792	0.0638	0.0717	0.0045
Family and peers	0.0955***	0.0516	0.1629*	0.1585*	0.1115**	-0.0791
Household income	0.1211**	0.0642	0.1022**	0.0944***	0.0790	-0.0704
Mother's education	0.0983**	0.0732	0.1260**	0.1030**	0.1215**	0.0490
Father's education	0.1110**	0.0862***	0.1541*	0.1622*	0.0832***	0.0458
Mother entrepreneur	-0.0136	0.0818***	0.0843***	0.0533	0.0844***	0.0320
Father civil servant	-0.0654	-0.2089*	-0.1663*	-0.1621*	-0.1131**	0.0872***
Father - private sector	0.0825***	-0.0221	0.0598	0.0290	0.0648	-0.1081**
Father - entrepreneur	-0.0153	0.0919***	0.0271	0.0258	0.0196	0.0579
Fiscal literacy	0.0873***	0.0536	0.2781*	0.1952*	0.2678*	-0.0647

*p<0.01; **p<0.05; ***p<0.1

The preference for the capital market is measured by the respondents' preference for both main financial assets of this market, shares and bonds. The statistics indicate that 12% of the respondents selected both financial instruments. Table 2 reports the estimates of the ordered logistic regression that shows what shapes young people's preference for capital market investments.

Table 2. Estimates of the ordered logistic regression

Factors	(1)	(2)	(3)
Extra financial education		0.491**	
		(0.196)	
Difficulties in purchasing goods they desire	-0.177**	-0.150**	-0.164**
	(0.0755)	(0.0731)	(0.0758)
Household income			0.127
			(0.0833)
Literacy	0.181*		
	(0.0318)		
Basic		0.240*	
		(0.0737)	
Advanced			0.244*
			(0.0409)
Risk aversion	-0.370	-0.408***	-0.358
	(0.233)	(0.234)	(0.230)
Constant cut1	0.734**	0.238	0.805**
	(0.353)	(0.334)	(0.379)
Constant cut2	2.931*	2.362*	3.023**
	(0.372)	(0.347)	(0.412)
McFadden R^2	0.537	0.0330	0.0589

*p<0.01; **p<0.05; ***p<0.1

We notice that financial literacy positively influences the preference of young people for capital market investments. The effect is greater in the case of advanced financial literacy. The more financial knowledge and specific skills they acquire, the more young people will be inclined to invest in both instruments. In the case of the model (2), the participation in extracurricular financial education activities before the university studies becomes statistically significant and has a positive influence on the preference for the capital market investments. This result suggests that in order to become a more sophisticated investor with a more diversified portfolio, the skills limited to basic financial literacy are not sufficient, requiring additional financial knowledge. Risk aversion also becomes statistically significant in the case of the model with basic financial literacy. The coefficient shows that the inclination to invest in more capital market assets is diminished by it. People, in general, are risk averse. A high-risk aversion combined with a low level of basic financial literacy will determine individuals not to invest in the capital market. If young people face difficulties in satisfying their desires, the probability of investing in the capital market decreases significantly.

6. Conclusions

This paper aimed at examining the role played by financial literacy in shaping young people's preference for two main assets of the capital market: shares and bonds. We also investigated how risk aversion can influence their proneness towards these financial products. Besides financial literacy and risk aversion, we analysed how financial behaviours can affect the preference for capital market investments. For these purposes, we conducted a survey among the students enrolled in the finance-banking oriented faculty at the largest university of economics in Romania. The survey was based on a questionnaire comprising 40 questions that assessed general social and demographic features of the respondents, financial behaviours, risk aversion, basic and advanced financial literacy. For this study, we used a sample of 416 respondents of Romanian nationality. Using the information collected from the survey, we employed an ordered logistic regression in order to investigate what factors can shape young people's preference for capital market investments. The investigation led us to several findings.

We noticed an improvement for both basic and advanced financial literacy as the students have progressed through their finance intensive university studies. The risk appetite also seems to increase as the level of financial literacy increases, but we cannot decide on the intensity of this correlation.

There is a quite strong connection between the parents' financial behaviour and that of their children, which suggests that parents have largely passed on this behaviour to their children. Among the financial behaviours that we examined, both parents and children seem to be more concerned with budget discipline. They are also concerned with a regular tracking of their expenses. The results of the survey showed that the percentage of parents who save is quite low, and that of parents who make long-term investments regularly is even lower. We noticed this financial behaviour in children as well. Young people prefer the media (social media, TV, radio, newspapers, etc.) as a source of financial information, followed by their parents and peers and financial consultants are only last. Regarding the young people's preferences, the results of the survey indicated similar percentages for shares and savings accounts. The results also showed that young people are not aware of the latest tax regulations applied to investment income.

Regarding the factors that influence young people's preference for capital market investments, estimates have shown that financial literacy stimulates their propensity for a more diversified portfolio that includes both instruments, namely shares and bonds. If individuals are characterized only by basic financial literacy (numerical skills, etc.), then their participation in financial education activities may enhance their preferences for a more diversified portfolio. Finally, if young people face difficulties in satisfying their desires, the proneness to invest in the capital market will be diminished.

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References

[1] Arrow, K. J. (1965). Aspects of the theory of risk-bearing. Yrjö Jahnssonin Säätiö lectures.

[2] Beckmann, E. (2013). Financial Literacy and Household Savings in Romania. Numeracy, Advancing Education. *Quantitative Literacy*, 6(2): Article 9.

[3] Cole, S., & Shastry G. (2009). Smart Money: The Effect of Education, Cognitive Ability, and Financial Literacy on Financial Market Participation. *Harvard Business School Working Paper* 09-071.

[4] Demirguc-Kunt, A., Hu, B., & Klapper, L. (2019). Financial Inclusion in the Europe and Central Asia Region: Recent Trends and a Research Agenda. *Policy Research Working Paper*, 8830, The World Bank.

[5] Grifoni, A., & Messy, F. (2012). Current Status of National Strategies for Financial Education: A Comparative Analysis and Relevant Practices. *OECD Working Papers on Finance, Insurance and Private Pensions*, No. 16, OECD Publishing.

[6] Hartog, J., Ferrer-i-Carbonell, A., & Jonker, N. (2000). On a Simple Survey Measure of Individual Risk Aversion. *CESifo Working Paper Series*, 363, CESifo Group Munich.

[7] Investors Compensation Fund. (2018). Annual Report, http://www.fond-fci.ro/docs/Raport%20anual%202018.pdf.

[8] Lusardi, A. (2008). Household Saving Behavior: The Role of Financial Literacy, Information, and Financial Education Programs. *NBER Working Papers*, 13824, National Bureau of Economic Research.

[9] Lusardi, A., & Mitchell, O. (2014). The Economic Importance of Financial Literacy: Theory and Evidence. *Journal of Economic Literature*, 52(1), pp. 1-40.

[10] Pratt, J. W. (1964). Risk Aversion in the Small and in the Large. *Econometrica*, 32(1), pp. 122-136.

[11] Shim, S. et al. (2010). Financial Socialization of First-year College Students: The Roles of Parents, Work, and Education. *Journal of Youth and Adolescence*, 39(12), pp. 1457-70.

[12] van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, 101(2), pp. 449-472.

[13] Zou, J., & Deng, X. (2019). Financial literacy, housing value and household financial market participation: Evidence from urban China. *China Economic Review*, 55, pp. 52-66.

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Volatility Episodes and Patterns in Currency Returns

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Abstract

Portfolio management under episodes of high volatility spurs difficult decision-making for asset managers in the pursuit of risk minimization as benefits from international diversification become less relevant. Dynamics of currencies under such developments add a new layer of risk. A clear description of the reaction of currencies to volatility shocks perceived in capital markets is therefore important for the success of risk management undertakings. Our paper studies the persistence of the impact of volatility changes on currencies, to enhance the prediction needed for international portfolio risk management. Our analysis focuses on the highest ranked currencies in terms of over-the-counter (OTC) foreign exchange turnover according to the latest Triennial Central Bank Survey of the Bank of International Settlements (2019). We use daily bilateral rates of 29 currencies against the US dollar collected from FRED (Federal Reserve Economic Data) and Pacific Exchange Rate Service. Our approach identifies high-volatility episodes in financial markets based on VIX, which is a widely used indicator of global financial market volatility, between January 1999 and December 2019. Specifically, we investigate the behaviour of exchange rates against the US dollar during these episodes of volatility in financial markets, by considering the first four moments of currency return distribution in a Statistical Clustering methodological framework. We find that, overall, currency returns have a rather homogeneous behaviour in turbulent times, which generates difficulties in distinguishing separate asset classes in the foreign exchange market. We cannot distinguish separate asset classes in the foreign exchange market based on currency return distributions, but knowing that currency returns exhibit similar patterns may prove to be useful for portfolio managers for designing their active investing and/or hedging strategies in a highly correlated world.

Keywords: Volatility, currency returns, cluster analysis.

JEL Classification: C38, G11, G15

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1. Introduction

Portfolio management under episodes of high volatility spurs difficult decision-making for asset managers in the pursuit of risk minimization as benefits from international diversification become less relevant. Dynamics of currency returns under such developments add a new layer of risk. A clear description of the reaction of currencies to volatility shocks perceived in capital markets is therefore important for the success of risk management undertakings. Our paper studies the persistence of the impact of volatility changes on currencies, to enhance the prediction needed for international portfolio risk management.

2. Problem Statement

The patterns of risk variations in stock and currency return dynamics are a widely explored feature in academic papers. Various studies address stylized facts such as volatility clustering, time dependence of returns, significant asymmetries, or spillover effects. Moreover, the connection between equity markets and currency reactions to regime shifting in either volatility or mean dynamics is a direction that was also investigated.

Among the seminal papers that investigated episodes of volatility shocks, we mention Schwert (1989), whose paper investigates the connection between the volatility of stock returns and macroeconomic variables; he also notes that previous research has highlighted the significant equity prices volatility during the Great Depression. The author continues the investigation of financial market volatility – see Schwert (1990) – using daily data and implied volatility applied to the October 1987 crash, considered an abnormal jump in the volatility dynamics. The unexpected nature of such shocks, together with the realm of calmness that usually quickly settles in the aftermath, beclouds the comprehension of underpinnings for volatility spikes in the framework of continuous financial market dynamics. Various following studies focused on deciphering this puzzle.

As such, Maheu and McCurdy (2002) explain the nonlinear characteristics of volatility for currency pairs under double stochastic frameworks, while Gaunersdorfer and Hommes (2007) use regime shifting techniques to investigate sudden changes in volatility and conclude that clustering is a feature that is embedded into market dynamics, i.e. an endogenous phenomenon emerging in the trading process. In the same research direction, Wang and Moore (2009) analyse the shifts in volatility mainly in European Union stock markets before the 2007 crisis, but also investigate a series of sizeable volatility changes during regional stock market crashes. They conclude that these "sudden changes" in volatility are the result of special dynamics in financial emerging markets, of unexpected changes in exchange rate policies, but also of market crashes.

From the international perspective, Edwards and Susmel (2001) investigated the cross-country correlation between episodes of high market volatility in Latin American stock markets. The regime-shifting models and co-dependence of volatility regime methodologies employed by them lead to the conclusion that high-volatility episodes were rather short-lived, but they manifest simultaneously in Mercosur countries. Similarly, Kaminsky and Reinhart (2002) identify the mostly synchronized markets internationally in an analysis covering the 1997-1999 period. The two authors find

interesting the spillover effects particularly in periods of interest rate peaks and high negative changes in stock market returns.

3. Research Questions

Our paper continues the previous research of Horobet et al. (2009), Horobet et al. (2010), and Horobet and Belascu (2015) on the relevance of high-volatility episodes for the behaviour of currency and interest rates. The approach proposed here represents a useful tool for institutional investors confronted with the issue of risk diversification in volatile times. We use cluster analysis to identify homogeneities and dissimilarities in the behaviour of exchange rates during volatile periods, which may support managers' decisions to protect returns and/or to diversify risk in their portfolios in turbulent periods. This tool should be seen as a natural addition to decisions in the mean-variance framework proposed by the modern portfolio theory (Markowitz, 1952) or in a dynamic view, by taking into account the higher moments of return distributions, based on the models proposed by Fabozzi et al. (2006), Harvey et al. (2010), and Mhiri and Prigent (2010).

4. Research Methods

Our analysis focuses on the highest ranked currencies in terms of over-the-counter (OTC) foreign exchange turnover in 2019, according to the Triennial Central Bank Survey of the Bank of International Settlements (BIS 2019). The de facto exchange rate and monetary arrangements for these currencies vary from floating to administered arrangements, conventional pegs, or stabilized arrangements, depending on the degree of flexibility of exchange rates and the intervention of monetary authorities (i.e. central banks) in the process of exchange rate determination. It is interesting to note that for the overwhelming majority of these currencies, the monetary policy rule is inflation targeting that focuses on price stability as the main objective of a country's monetary policy – see IMF, 2019.

We use 29 exchange rates as exchange rates with no volatility over periods covering at least one of the identified high-volatility episodes have been excluded – these are the Chinese yuan, the Malaysian ringgit, the Taiwan new dollar, the Saudi Arabia riyal –, but also the Danish krone, in whose case the fixed exchange rate against the Euro after 1999 generates the same pattern in returns as the EUR/USD exchange rate. We use daily bilateral rates against the US dollar collected from FRED (Federal Reserve Economic Data) and Pacific Exchange Rate Service. Of the 29 exchange rates, two – the Singapore dollar and the Czech koruna – have a stabilized arrangement, and the remaining 27 have floating exchange rate regimes.

Volatility in financial markets is a reality that cannot be ignored; but although it tends to be noticed during turbulent periods, the presence of volatility is more pervasive, as intervals of increased turbulence in financial markets may be spotted rather frequently. Our approach identifies high-volatility episodes in financial markets based on daily VIX values, an indicator of U.S. equity market volatility, widely used as a proxy for global financial market volatility. We employ the methodology used in Horobet and Belascu (2015), i.e., the start of a high-volatility episode is the day when there is a

10 percentage point change in VIX above its 60-day backward-looking moving average; similarly, a high volatility episode is considered closed the day when VIX is below the value recorded at start of episode. The minimum length of a high-volatility episode is twenty days, needed for the subsequent work on daily currency return distributions. Our analysis covers the period January 4th, 1999 - December 31st, 2017. Data on VIX was collected from the Chicago Board of Trade website. Figure 1 shows the VIX evolution between 1999 and 2017, allowing us to notice the presence of ten high volatility episodes, most manifested in 2001, 2002, 2007, 2008 and 2011. Table 2 shows the episodes identified and the number of days included in each of them. The longest episode is found in 2008 - Episode 6 (74 days), and the shortest in 2015 - Episode 10 (30 days). Besides these episodes of minimum 20 days length, we spot 182 shorter episodes that include 1 to 18 observations days each.

We apply a smachine-learning based k-means Statistical cluster analysis (SCA), proposed by Hartigan and Wong (1979) and discussed in Witten et al. (2011), whose objective resides in assigning cases to identified clusters with or without a priori setting a specific number of clusters. Thus, the means of the variables included in the amalgamation are as different as possible between them. SCA's objective, in our case, is the identification of homogeneous groups of currency returns (cases) across the ten high-volatility episodes mentioned above based on the first four moments of return distributions – mean, standard deviation, skewness and kurtosis (variables), using the Euclidian distances and the Ward amalgamation method applied on standardized values.

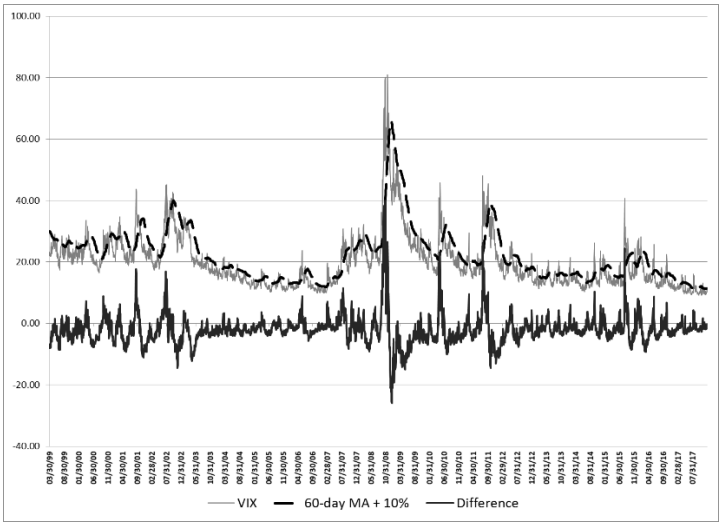

Figure 1. VIX versus 60-days moving average, 1999-2017
Source: Authors' development based on data from Chicago Board of Trade

Table 1. High-volatility episodes, 1999-2017

Episode number	Interval	Number of days
1	October 6th, 2000 –November 16th, 2000	30
2	August 30th, 2001 – October 23rd, 2001	34
3	June 3rd, 2002 – August 13th, 2002	51
4	May 12th, 2006 – June 20th, 2006	27
5	July 20th, 2007 – August 23rd, 2007	25
6	September 12th, 2008 – November 25th, 2008	52
7	May 4th, 2010 – June 14th, 2010	29
8	July 26th, 2011 – October 5th, 2011	51
9	May 11th, 2012 – June 14th, 2012	24
10	August 20th, 2015 – September 18th, 2015	21

Source: Authors' development

5. Findings

5.1. Brief analysis of currency return frequency distributions

The study of currency return properties across the ten high volatility episodes allows us to uncover preliminary behavioural patterns of these returns. Figure 2 shows the boxplots of currency return distribution moments for each volatility episode.

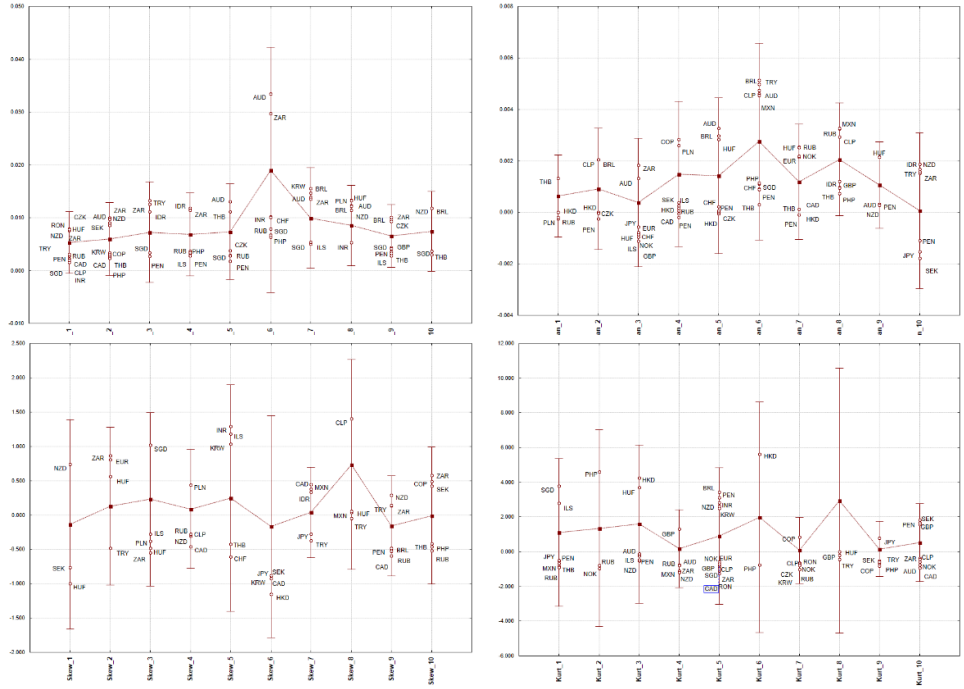

Figure 2. Boxplots of currency return means (up left), standard deviations (up right), skewness (down left), and excess kurtosis (down right), 1999-2017

Note: Squares indicate means and circles indicate outliers, defined as "observation > UBV +1.5 × (UBV – LBV)" or "observation < LBV – 1.5 × (UBV – LBV)"; UBV - upper value of the box in the boxplot, LBV - lower value of the box in the boxplot

Source: Authors' development based on data from Chicago Board of Trade

The averages of mean returns of exchange rates are variable from one episode to the other, but they are always positive; the highest mean is recorded in episode 6, which covers the Global Financial Crisis, and the lowest in episode 10. Across episodes and exchange rates, negative return means dominate, with the notable exception of episode 10, where 19 mean returns are positive and only 10 are negative. The range of means across the sample is variable from one episode to another, with the smallest values in episode 1 and episode 9. Episode 6 shows the highest mean standard deviation of currency returns, but also the highest range of all episodes. Rather curious, the mean standard deviations seem to increase as we move from episode 1 to episode 6 and afterwards decline until episode 9, but increase again in episode 10. In skewness terms, the means are positive for six episodes and negative for four episodes, without a clear pattern; the highest mean skewness is in episode 8 and the lowest in episode 6. Excess kurtosis values have positive means for all episodes, which indicates leptokurtic currency return distribution on average, but across episodes the number of distributions with positive excess kurtosis is variable – episodes 8, 6 and 3 show the highest number of leptokurtic return distributions (27, 25 and 24, respectively).

5.2. Cluster analysis results

Figure 3 shows the final classification of currency returns in clusters for each of the ten high-volatility episodes, as well as the distance to the cluster centroids for each currency pair for all types of clusters.

Figure 3. Cluster membership and distances to centroid
Source: Authors' development

The k-means clustering algorithm indicates the presence of three clusters: 18 exchange rates in the first cluster (62.07% of cases; AUD, CHF, SEK, MXN, NZD, NOK, KRW, TRY, RUB, BRL, ZAR, PLN, HUF, CZK, CLP, IDR, COP and RON), 3 exchange rates in the second one (10.34%; JPY, HKD and PEN) and 8 in the third (27.59%; EUR, GBP, CAD, SGD, INR, THB, ILS and PHP). Table 2 shows the distance

between centroids. The smallest distance is between clusters 1 and 3 and the highest between clusters 1 and 2.

Table 2. Distances between cluster centroids

	Cluster 1	Cluster 2	Cluster 3
Cluster 1	0.0000	2.0222	0.9870
Cluster 2	2.0222	0.0000	1.5667
Cluster 3	0.9870	1.5667	0.0000

Source: Authors' development

In the second clusterisation, Cluster 2, that includes only 3 exchange rates, is the most homogeneous of the three clusters – distances to centroid fall in a range between 1.028 (JPY) and 1.249 (HKD) –, while Cluster 1 is the most heterogeneous, given a range of distances to centroid between 0.819 (NOK) and 1.857 (COP). Interestingly, the ANOVA procedure on both clustering algorithms shows that means and standard deviations are the main providers of differentiation between clusters, but also that the first two volatility episodes matter less for cluster building than the other episodes.

Figure 4 presents graphically the attributes of the identified clusters. The differentiation between the three clusters is clear-cut, as the "dominance" of a cluster over the other two in terms of all or at least a significant part of the variables is not present. Still, two of the three clusters are clearly segregated by the clustering variables; Cluster 1 includes currency returns with generally high average means, high standard deviations and, to some extent, low kurtosis, Cluster 2 features on average exchange rates returns with low means, low standard deviations and high kurtosis, while Cluster 3 captures returns with low skewness and low kurtosis.

6. Conclusions

Our paper's objective resided in identifying similarities and dissimilarities in the behaviour of the most traded exchange rates during volatile periods. Our novel approach was focused on noticing whether the first four moments of exchange rate returns based on the US dollar may provide complementary information to portfolio managers' decisions to protect the returns and/or to diversify the risk of their investments in turbulent periods.

Our analysis has implications for international investors interested in forecasting currency behaviour in likely high-volatility episodes in the future; since the majority of currencies have similar return distribution properties across volatility episodes, this can be expected to continue in the future and is relevant from the perspective of international portfolio investors, who diversify their holdings across various asset classes and currencies.

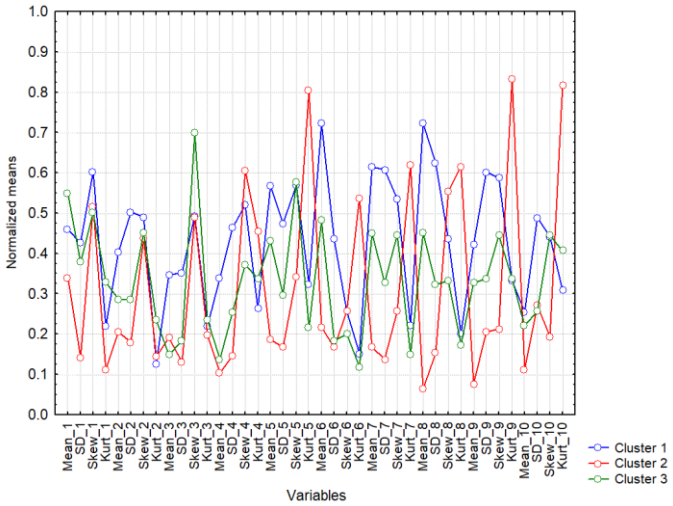

Figure 4. Cluster attributes based on variables standardized values
Source: Authors' development

Overall, we cannot distinguish separate asset classes in the foreign exchange market based on currency return distributions, but knowing that currency returns exhibit similar patterns may prove to be useful for portfolio managers for designing their active investing and/or hedging strategies in a highly correlated world. Therefore, cluster analysis may be successfully used as a natural add-on to the traditional mean-variance portfolio framework or the newer proposed portfolio selection models based on the higher moments of return distributions.

References

[1] Triennial Central Bank Survey of Foreign Exchange and Over-the-Counter (OTC) Derivatives Markets in 2019. *The Bank for International Settlements*, September 16, 2019. https://www.bis.org/statistics/rpfx19.htm.

[2] Annual Report on Exchange Arrangements and Exchange Restrictions 2018, *International Monetary Fund*, Washington: DC.

[3] Edwards, S., & Susmel, R. (2001). Volatility Dependence and Contagion in Emerging Equity Markets. *Journal of Development Economics*, 66(2), pp. 505-532.

[4] Fabozzi, F. J., Kolm, P. N., Pachamanova, D. A., & Focardi, S. M. (2007). *Robust Portfolio Optimization and Management*. Hoboken: John Wiley & Sons.

[5] Gaunersdorfer, A., & Hommes, C. (2007). A Nonlinear Structural Model for Volatility Clustering. In G. Teyssière, & A. P., Kirman (Eds.), *Long Memory in Economics*, pp. 265-288. Berlin: Springer.

[6] Hartigan, J. A., & Wong, M. A. (1979). Algorithm AS 136: A k-means clustering algorithm, *Applied Statistics*, 28(1), pp. 100-108.

[7] Harvey, C. R., Liechty, J. C., Liechty, M. W., & Müller, P. (2010). Portfolio selection with higher moments, *Quantitative Finance*, 10(5), pp. 469-485.

[8] Horobet, A., Belascu, L. (2015). The behaviour of Central and East European stock markets during high-volatility episodes, *The 9th International Days of Statistics and Economics*, Prague, September 10-12, 2015, https://msed.vse.cz/msed_2015/article/162-Horobet-Alexandra-paper.pdf.

[9] Horobet, A., Dumitrescu, S., & Dumitrescu, D. G. (2009). Uncovered interest parity and financial market volatility. *The Romanian Economic Journal*, 12(32), pp. 21-45.

[10] Horobet, A., Dumitrescu, S., & Dumitrescu, D. G. (2010). Implications of volatility for uncovered interest parity testing. In R. Matousek (Ed.), *Money, Banking and Financial Markets in Central and Eastern Europe. 20 Years of Transition*, pp. 253-275. Houndmills: Palgrave MacMillan.

[11] Kaminsky, G. L., & Reinhart, C. M. (2002). Financial Markets in Times of Stress. *Journal of Development Economics*, 69(2), pp. 451-470.

[12] Maheu, J. M., & McCurdy, T. H. (2002). Nonlinear Features of Realized FX Volatility. *The Review of Economics and Statistics*, 84(4), pp. 668-681.

[13] Markowitz, H. (1952). Portfolio Selection. *Journal of Finance*, 7(1), pp. 77-91.

[14] Mhiri, M., & Prigent, J.-L. (2010). International Portfolio Optimization with Higher Moments, *International Journal of Economics and Finance*, 2(5), pp. 157-169.

[15] Schwert, G. W. (2006). Stock Volatility and the Crash of '87. *Review of Financial Studies*, 3(1), pp. 77-102.

[16] Schwert, G. W. (1989). Why Does Stock Market Volatility Change Over Time? *Journal of Finance*, 44(5), pp. 1115-1153.

[17] Wang, P., & Moore, T. (2009). Sudden Changes in Volatility: The Case of Five Central European Stock Markets. *Journal of International Financial Markets, Institutions and Money*, 19(1), pp. 33-46.

[18] Witten, I. H., Eibe, F., & Hall, M. A. (2011). *Data Mining: Practical Machine Learning Tools and Techniques* (3rd ed.). Burlington: Morgan Kaufmann Publishers.

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The Influence of Economic Freedom, Government Effectiveness and Human Development on Shadow Economy in the European Union

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Abstract

Decreasing the size of the shadow economy is a priority for the states that want their economy to evolve. But shadow economy encompasses all spots of economic environment. Being such a complex phenomenon, it is imperative not to neglect the factors that shape the behaviour of citizens in general, but especially of taxpayers, when it comes to shadow economy activities. Therefore, this paper intends to highlight the influences involved by the standard of human development, the economic freedom a taxpayer perceives and the government effectiveness, in relation to the shadow economy and to add another piece in understanding the tax compliance puzzle. The paper covers the 28 EU member states for a period of 20 years.

Keywords: shadow economy, fiscal freedom, government effectiveness, human development, tax behaviour

JEL Classification: E26, G38, G41, O15

1. Introduction

Understanding the economic behaviour of the taxpayer is a challenge for a European fiscal context in which the public financial system is at the borderline of economic and political aspects. Decisions of the individuals, seen as social beings with different values and attitudes, but from an economic prospect, are difficult to quantify. In the scholarly literature, in most cases the exclusive focus is placed on economic analyses, minimizing, or even completely neglecting sometimes the impact of human factors. Thus, there are many experts who have developed models for shaping constructive policies as regards the authorities and the society.

This research brings new lines that must be followed by states that want to improve the level of the shadow economy. It intends to highlight the influences

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involved by the standard of human development, the economic freedom a taxpayer perceives and the government effectiveness, in relation to the shadow economy and to add another piece in understanding the tax compliance puzzle. In addition to the novelty that these factors are analysed together, in this form, the period subject to analysis is itself an element of novelty. Economic changes are constantly evolving, and the analysed period comes bundled with a series of economic innovations, which will be reflected in the final conclusions of this paper.

2. Problem Statement

Tax systems, even in developed countries, grapple with the matter of shadow economy daily. A high level of the shadow economy is usually associated with the weak performance of the authorities in collecting taxes. There are many factors that influence the volume of the shadow economy activities and many of them, like abstruse tax laws, the absence of incentives, the faint tax enforcement, were highly debated in the literature. Besides these, this paper aims to point out the influence that some variables such as human development, economic freedom, and government effectiveness manifest on shadow economy.

According to *Torgler (2007)*, the activities covered by the shadow economy are unlimited, but the most frequently investigated area is tax evasion. Whether it arises from commissive actions or from omission actions at times, this concept excludes behaviours resulting from not imputable noncompliance of the agent such as the lack of knowledge, mental problems, or miscalculations. In one of his researches (*Brașoveanu, 2010*), the author explains these concepts, pointing out that tax evasion can be intercepted and quantified by the state, naming it identified, whereas the one not noticeable by the state is actually the one included in the shadow economy.

Tax compliance represents the taxpayer behaviour in the sense of declaring all his/her income and paying the related taxes (*Alm, 1991*). In a simple definition, tax compliance is the meticulous observance of the tax regulations by the taxpayer (*James and Alley, 2002*). According to *Dumitru (2018)*, the increase in taxation suffocates the taxpayers, causing them to evade the path of paying taxes. Therefore, the tax burden is a factor of influence for the taxpayers and, by extension, for the tax collection.

Gobena & Van Dijke (2017) have been analysing the procedural role of the competent tax authorities, the trust of the taxpayers regarding the management of the tax revenues by the government and their identification with the nation reported to the level of voluntary tax compliance. Based on their research, the procedural justice results should be seen as being a tool in stimulating the social-psychological behaviour of the taxpayers in the matter of complying with tax law.

This correlation is sustained by the slippery slope mechanism at the level of tax compliance (*Kirchler et al., 2008*), which implies that the trust and the power of constraint tax authorities possess are critical dimensions in understanding this phenomenon. Specifically, while authorities' coercive power determines forced compliance with fiscal obligations, the trust in the way public authorities handle

the revenue collected from the taxpayers determines their voluntary compliance (*Kirchler, 2007*). The framework argues that if taxpayers perceive a higher likelihood of tax evasion being detected and punished by competent authorities (this is interpreted as a coercive power), the level of compliance with tax obligations will also increase.

3. Research Questions / Aims of the Research

As support for the arguments exposed in the previous section, it is suitable that an econometric model is consolidated, in order to consider different taxation climates, but the model will be restricted to the 28 member states of the European Union[2] (herein referred to as the "EU Member States"). Current European context is competitive in terms of taxation. States devise their fiscal policies, depending on their needs to attract investors and resources, to encourage the development of certain sectors of activity or, sometimes, even to remove certain categories of investors from national markets. Thus, EU Member States are all restricted by the EU authorities, hence, it is accurate to affirm that all of them shape their strategies on the same prerequisites.

4. Research Methods

The econometric model will be designed using EViews − version 10.2. The timeframe to be analysed is 1996 - 2015, for all EU Member States and the data set consists of 560 observations. The variables that were selected relied on other empirical studies carried out by *Dronca (2016), Schneider and Feld (2010), Schneider and Williams (2013),* and *Schneider and Buehn (2012).* As tax evasion is difficult to measure because the individuals involved usually remain untraceable, the shadow economy is used as a proxy for the volume of the tax evasion. From the extensive research drawn regarding this analysis, there are no estimates of the tax revenues evaded regarding the EU Member States. In the next table, the 4 variables used in the model are defined.

Table 1. Variables included in the EViews model

Variable	Meaning	Source
Dependent variable		
Shadow Economy (ShEco)	It encompasses the number of transactions of goods & services that are not reported to the public authorities and, therefore, they cannot be identified by tax collectors and regulators.	Medina & Schneider[3]

[2] The United Kingdom will also be included in this study, as during the period for which the data were processed, it was part of the EU.

[3] Medina, L., Schneider, F. (2018). *Shadow Economies Around the World: What Did We Learn Over the Last 20 Years?*. International Monetary Fund.

Variable	Meaning	Source
Independent variables		
Index of Economic Freedom (IEF)	It scores and ranks countries according to their significance on economic freedom.	Heritage Foundation[4]
Government Effectiveness (GE)	It scores and ranks 5 dimensions of the governance (regulatory quality, rule of law, control of corruption, political stability and voice and accountability).	The World Bank[5]
Human Development Index (HDI)	It scores and ranks 3 dimensions of the human development (educational attainment, life expectancy and GDP/capita).	United Nations Development Programme[6]

Source: Medina & Schneider, Heritage Foundation, The World Bank, United Nations Development Programme

5. Findings

5.1. Data processing and results

The results of the estimation of the panel equation were obtained using the OLS method (LS - Least Squares (LS and AR)) and they are presented in Table 2. *Results from the EViews model*. The corrections for fixed and random effects were made using the Redundant Fixed Effects - Likelihood Ratio, respectively Correlated Random Effects - Hausman Test. As per the Hausman test and Likelihood Ratio test, the probability obtained is below the significance threshold of 5%, so both random and fixed effects can be neglected.

The model under analysis is valid (F-statistic = 276.2773 and Prob(F-statistic) = 0.0000%). Also, the indicator R^2 has a value of 59.8507%, which means that the variance of the shadow economy is influenced by the independent variables included in the model in a proportion of approximately 60%. The improved version of the R^2 (adjusted R^2), that considers the amount of independent indicators included in this regression, is 59.6341%. Specifically, if new independent variables are included in the equation and they manifest no relevance or low relevance on the shadow economy, this effect will be penalized through R^2. All indicators analysed in the model presented hereby are statistically significant for a significance threshold of 5%.

[4] https://www.heritage.org/index/, accessed on 20.01.2020.
[5] https://datacatalog.worldbank.org/, accessed on 20.01.2020;
[6] http://hdr.undp.org/, accessed on 20.01.2020.

Table 2. Results from the EViews model

	No effects	**Fixed effects**	**Random effects**
IEF Prob.	- 0.139294 0.0004	-0.139294 0.0004	-0.086547 0.0260
HDI Prob.	-27.11226 0.0000	-27.11226 0.0000	-31.75997 0.0000
GE Prob.	-5.619194 0.0000	-5.619194 0.0000	-5.557029 0.0000
C Prob.	56.66321 0.0000	56.66321 0.0000	56.73954 0.0000
R^2 R2 adjusted	0.598507 0.596341	0.598507 0.596341	0.633695 0.618688
F-statistic Prob(F-statistic)	276.2773 0.000000	276.2773 0.000000	42.22690 0.000000
T. Hausman	0.0000		
Redundant Fixed Effects Tests	0.0001		

Source: Own estimations using EViews

For the analysed variables, the correlation matrix is presented in Table 7. *EViews – Correlations*. The results obtained are between (-0.706606) and (+0.621605), which means that there are correlations between variables, some positive, which means that they are influenced positively, respectively negative ones, which means that there is a negative influence between variables.

In order to have a more comprehensive perspective on the analysis undertaken, the model was also estimated using the Robust Least Squares method, which provides improved regression coefficient estimates when outliers exist. This procedure identifies the outliers and minimizes their influence on the estimation of the coefficients. The results are presented in Table 8. *EViews Output (Robust Least Squares).* The results highlight the same negative link between shadow economy and economic freedom, government effectiveness and human development.

From the analyses on the econometric model, the conclusion is that there is an inverse connection between shadow economy and the 3 independent variables. This aspect is in accordance with the literature that in numerous studies (e.g., *Gemmell, 2001; Princen & Mourre, 2013*; *Lopez, Thomas & Wang, 2010*) indicates that fiscal policies and budget policies have such a defining role regarding the characteristics of the economic framework and thus influencing individuals' behaviour.

As regards the economic freedom, citizens are living in probably the wealthiest and most economically prosperous period, a period that offers various opportunities for exploring any kind of decisions, within the law, regarding their own labour and ownerships. It is said that economic freedom is associated with prosperity for individuals, but the way it impacts the welfare of states is questionable. In order to obtain an answer for the second aspect, the results in the modelled pattern should be viewed.

The shadow economy and the index of economic freedom are linked by a negative coefficient. When an individual does not feel the pressure of state factors in its economic decisions, not feeling the constraint or coercion, his/her desire to hide and try to fulfil his/her options through hidden and evasive methods will decrease. So, in order to improve the level of the registered underground economy, a state must give its taxpayers enough freedom so that they do not feel the necessity to protect themselves for maintaining liberty itself.

The results in the model commissioned in conjunction with the second independent variable are in the sense of the existence of an inverse connection between the human development index and the shadow economy. This means that when the human development that is registered within a state is increasing, the level of the shadow economy will decrease.

For understanding this connection, it is mandatory to see how the human development index is quantified. As per the United Nations Development Programme, it has 3 dimensions, measuring the educational attainment, life expectancy and the GDP/capita. These 3 directions outline a fuller picture of how a state is handling the satisfaction of its citizens and if the state has a citizens-orientated approach in the national policy choices.

Regarding the efficiency in governance, it expresses the trustworthiness of the citizens in the government's commitment to fulfil the obligations assumed, to increase the prosperity through policies outlined on the needs of the state and to act in a fair and legal manner. The civil services and the perception of the individuals regarding their quality is a very important tool in decreasing the level of the shadow economy, as per the analyses hereby presented. When governments establish clear policies and balanced budgets so that the state's main needs are met, and development is also felt by the citizens, the sense of fairness of taxpayers will be improved, and their focus on evasion activities will be significantly diminished.

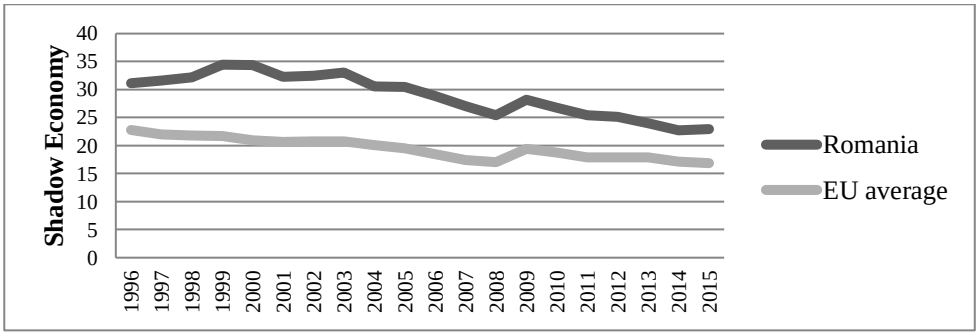
5.2. Analysis of the Romanian framework

As regards the evolution of the shadow economy in Romania, predominantly it was a descending one, reaching from the level of 31.12% reported in 1996 to 22.94% reported in 2015. If, until 1999, the shadow economy in Romania was steadily growing, from 1999, when Romania adopted the National Plan of Accession to the European Union, it began to have a downward trend.

During the analysed period, the lowest level for shadow economy was reported in 2014, and the highest value for the shadow economy was reported in 1999. According to the Romanian Fiscal Council[7], 2014 brought a considerable improvement in the transparency of fiscal policy in Romania. Also, for 2014 the Romanian economy registered economic growth for the fourth consecutive year, the advance in the real gross domestic product (GDP) being 2.8%.

[7] Romanian Fiscal Council (2015), *Annual Report 2014*, www.consiliulfiscal.ro, accessed on 20.01.2020.

Graph 1. Trend of the shadow economy in Romania, 1996 - 2015



Source: Own data-processing based on Schneider

As *Zaman & Goschin (2013)* mention in their study, it is essential to notice the dynamics of the underground economy from different angles. In terms of GDP and GDP per capita, the levels of the shadow economy are as described in the next Table 1. *Shadow economy indicators, Romania, 1996-2015*. The trend of the volume of shadow economy per capita (in euro) is dissimilar from the trend of the shadow economy as percent of the GDP. Actually, shadow economy per capita (in euro) had an upward trend till 2008 (EUR 1,805.64), but starting with 2008, its trend has reversed, mainly because of the lengthened recession.

Table 3. Shadow economy indicators, Romania, 1996-2015

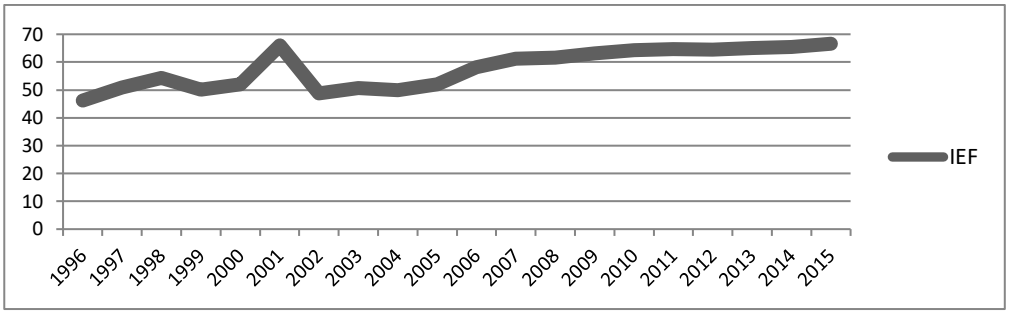
ROMANIA	GDP (million euro)	GDP per capita (euro)	Shadow economy (% GDP)	Shadow economy (million euro)	Shadow economy per capita (euro)
1996	29,035.4	1,281.57	31.12	9,035.82	398.82
1997	31,450.5	1,392.73	31.65	9,954.08	440.80
1998	38,063.3	1,689.74	32.18	12,248.77	543.76
1999	33,726.8	1,499.73	34.45	11,618.88	516.66
2000	40,594.9	1,807.79	34.40	13,964.65	621.88
2001	45,143.6	2,012.60	32.33	14,594.93	650.67
2002	48,695.7	2,230.32	32.51	15,830.97	725.08
2003	51,108.5	2,363.12	33.03	16,881.14	780.54
2004	60,402.0	2,806.64	30.57	18,464.89	857.99
2005	79,223.9	3,705.11	30.49	24,155.37	1,129.69
2006	97,215.6	4,573.34	28.88	28,075.87	1,320.78
2007	127,632.0	6,040.18	27.03	34,498.93	1,632.66
2008	146,590.6	7,097.63	25.44	37,292.65	1,805.64
2009	125,213.9	6,125.84	28.23	35,347.88	1,729.32

ROMANIA	GDP (million euro)	GDP per capita (euro)	Shadow economy (% GDP)	Shadow economy (million euro)	Shadow economy per capita (euro)
2010	125,408.8	6,179.39	26.76	33,559.39	1,653.61
2011	131,925.4	6,531.26	25.41	33,522.24	1,659.59
2012	133,147.1	6,625.55	25.14	33,473.18	1,665.66
2013	143,801.6	7,182.87	23.97	34,469.24	1,721.73
2014	150,458.0	7,542.77	22.73	34,199.10	1,714.47
2015	160,297.8	8,067.06	22.94	36,772.32	1,850.58

Source: Own data-processing based on *Eurostat*[8] and *Medina & Schneider (2018)*

The economic freedom in Romania reflects the economic performance of the country within 1996-2015. This index is in a continuous ascending trend since 2002, this growth being maintained even during the crisis period between 2008 and 2012. If in 1996, Romania ranked 28th (with 46.2 points), reporting the lowest level of the economic freedom index; in 2015, Romania surpassed states such as Italy or France, ranking 21st among EU member states (with 66.6 points). In this regard, Romania must remain on the same path and pursue the sustained growth of this index.

Graph 2. Evolution of the index of economic freedom in Romania, 1996-2015

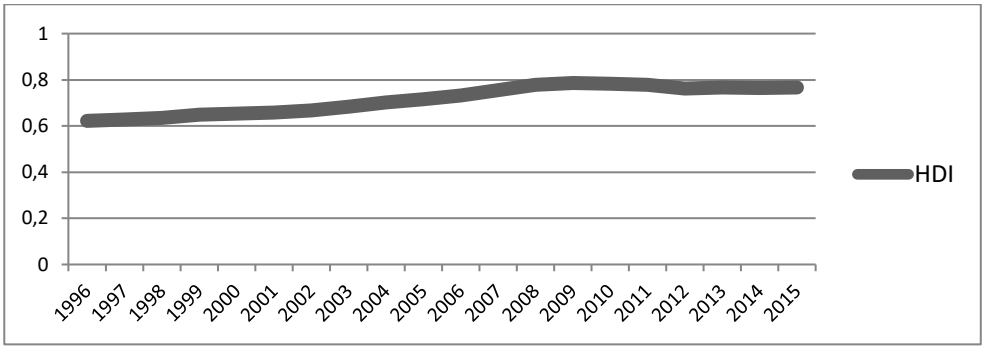


Source: Own data-processing based on *World Bank*

As concerns the human development index, it was reported a moderate dynamics during the period under analysis, in the light of the adversarial internal structural variations and adverse external shocks. The ascending trend of the human development index was acquired mainly due to the increase in the gross domestic product per capita. Even after more than 30 years since the collapse of communism, the political background in Romania continues to be unfavourable for the adequate human development.

[8] https://ec.europa.eu/eurostat/data/database, accessed on 08.02.2020.

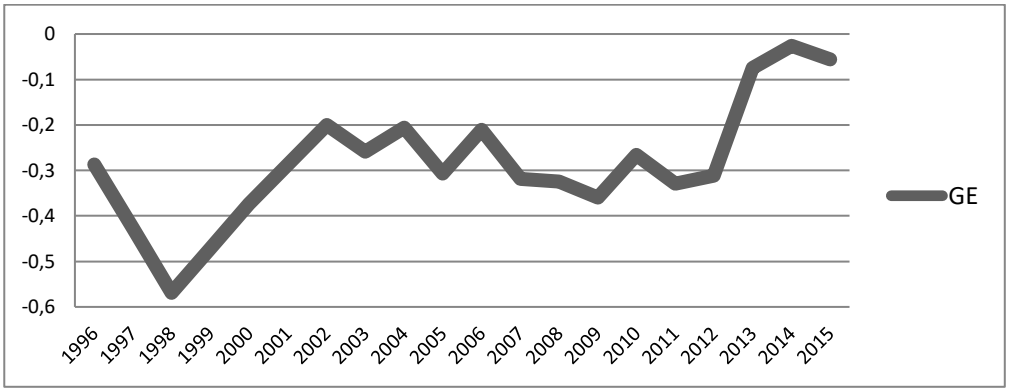
Graph 3. Evolution of the human development index in Romania, 1996-2015



Source: Own data-processing based on *World Bank*;

The results regarding the government effectiveness index reveal a strong progress on the governance infrastructure, but Romania ranks last among the other countries in European Union, each year in the period analysed. As stated in section 3.2 of this paper, the government effectiveness has a strong influence on the level of shadow economy. So, this is one of the reasons Romania has such a precarious performance when it comes to tax evading activities. Starting with 2013, the evolution of the government effectiveness index begins to be an ascending one, but even nowadays it is far from becoming a strengthening governmental environment.

Graph 4. Evolution of the government effectiveness index in Romania, 1996-2015



Source: Own data-processing based on *World Bank*

As concerns the results within the hereby analysis, in order to reduce the level of tax evasion in Romania, the Romanian government should pay more attention to the human development, especially to the education component, the quality of the institutions and their efficiency, as well as to the legal regulations so as to provide more economic alternatives of investment for the individuals to explore. Indeed, in the last 10 years under analysis (2005-2015), the trend of the shadow economy has been a decreasing one for Romania, being also influenced by the positive evolution of the 3 independent variables in the econometric study.

6. Conclusions

To conclude, as per the terms of reference and the methodology of the study, the taxpayer behaviour is influenced by a streamlining government, which ensures rational spending attempts to increase the level of efficiency. Also, the fiscal freedom taxpayers feel within the environment they are living in influences their tax-evading approach. As the rulings of a state are more predominant in the sense of creating a higher standard of education and quality of life, this attitude will be reflected in the level of the shadow economy reported by the state, in a positive manner.

Anyhow, as our society is, in all its aspects, dependent on how taxpayers react, the economically statistical analyses should be concentrated on the taxpayer behaviour. This is why this kind of methods in discovering patterns on how the taxpayer can influence the level of the shadow economy should continue in order to reveal forecasts and descriptions applicable on nowadays reality.

References

[1] Alm, J. (1991). *A Perspective on the Experimental Analysis of Taxpayer Reporting*. The Accounting Review, 66, pp. 577-593.

[2] Brașoveanu, I. V. (2010). *Underground economy and corruption: major problems of the Romanian economy*. Theoretical and applied economics, VII, pp. 68-80.

[3] Dumitru, I. (2018). *The unobserved economy in Romania − causes and consequences.* Romanian Fiscal Council website;

[4] Dronca, A. (2016). *The influence of fiscal freedom, government effectiveness and human development index on tax evasion in the European Union.* Theoretical and Applied Economics, XXIII, pp. 5-18.

[5] Gemmell, N. (2001). *Fiscal Policy in a Growth Framework.* WIDER Working Paper Series no. 2001/84.

[6] Gobena, L. B., Van Dijke, M. (2017). *Fear and caring: Procedural justice, trust, and collective identification as antecedents of voluntary tax compliance*. Journal of Economic Psychology, 62, pp. 1-16.

[7] James, S., Alley, C. (2002). *Tax compliance, self assessment and tax administration.* Journal of Finance and Management in Public Services, 2, pp. 27-42.

[8] Kirchler, E. (2007). *The economic psychology of tax behaviour*. Cambridge, UK: Cambridge University Press.

[9] Kirchler, E., Hoelzl, E., & Wahl, I. (2008). *Enforced versus voluntary tax compliance: The "slippery slope" framework.* Journal of Economic Psychology, 29, pp. 210-225.

[10] Lopez, R., Thomas, V., & Wang, Y. (2010). *The Effect of Fiscal Policies on the Quality of Growth*. The World Bank.

[11] Medina, L., Schneider, F. (2018). *Shadow Economies Around the World: What Did We Learn Over the Last 20 Years?*. International Monetary Fund.

[12] Princen, S., & Mourre, G. (2013). *The role of tax policy in times of fiscal consolidation*. Economic Papers 502.

[13] Romanian Fiscal Council (2015). *Annual Report 2014*, www.consiliulfiscal.ro.

[14] Schneider, F., & Feld, L. (2010). *Survey on the Shadow Economy and Undeclared Earnings in OECD Countries.* German Economic Review, 11, pp. 225-245.

[15] Schneider, F., & Buehn, A. (2012). *Shadow economy around the world: novel insights, accepted knowledge, and new estimates.* International Tax and Public Finance, 19, pp. 139-171.

[16] Schneider, F., & Williams, C. (2013). *The Shadow Economy*. Institute of Economic Affairs.

[17] Torgler, B. (2007). *Tax compliance and tax morale: a theoretical and empirical analysis.* Edward Elgar Publishing.

[18] Zaman, G., & Goschin, Z. (2013). *A new multidimensional ranking of shadow economy for EU countries.* Procedia Economics and Finance.

Appendix

This paper is based on data processing using the EViews software. In this appendix, the outputs that have been generated and interpreted accordingly will be attached.

Table 4. EViews Output

Dependent Variable: SHECO
Method: Panel Least Squares
Date: 09/14/20 Time: 10:16
Sample: 1996 2015
Periods included: 20
Cross-sections included: 28
Total panel (balanced) observations: 560

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	56.66321	2.452098	23.10805	0.0000
IEF	-0.139294	0.038971	-3.574270	0.0004
HDI	-27.11226	3.352747	-8.086583	0.0000
GE	-5.619194	0.392682	-14.30980	0.0000

Root MSE	4.623297	R-squared	0.598507
Mean dependent var	19.50534	Adjusted R-squared	0.596341
S.D. dependent var	7.302996	S.E. of regression	4.639898
Akaike info criterion	5.914379	Sum squared resid	11969.93
Schwarz criterion	5.945293	Log likelihood	-1652.026
Hannan-Quinn criter.	5.926450	F-statistic	276.2773
Durbin-Watson stat	2.491206	Prob(F-statistic)	0.000000

Source: Own estimations using EViews.

Subsequently, two methods were applied for testing the existence of random, respectively fixed effects, with the help of the Hausman and Redundant Fixed Effects tests (for the time component). According to these two tests, both fixed and random effects can be neglected. Hereinafter, the two outputs from EViews obtained after running the 2 tests are attached.

Table 5. EViews Output – Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	45.383539	3	0.0000

** WARNING: estimated period random effects variance is zero.
Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
IEF	-0.086547	-0.139294	0.000069	0.0000
HDI	-31.759970	-27.112263	0.853847	0.0000
GE	-5.557029	-5.619194	0.009944	0.5330

Period random effects test equation:
Dependent Variable: SHECO
Method: Panel Least Squares
Date: 09/13/20 Time: 20:47
Sample: 1996 2015
Periods included: 20
Cross-sections included: 28
Total panel (balanced) observations: 560

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	56.73954	2.403959	23.60254	0.0000
IEF	-0.086547	0.038775	-2.232051	0.0260
HDI	-31.75997	3.387099	-9.376747	0.0000
GE	-5.557029	0.394469	-14.08736	0.0000

Effects Specification			
Period fixed (dummy variables)			
Root MSE	4.416053	R-squared	0.633695
Mean dependent var	19.50534	Adjusted R-squared	0.618688
S.D. dependent var	7.302996	S.E. of regression	4.509633
Akaike info criterion	5.890513	Sum squared resid	10920.86
Schwarz criterion	6.068267	Log likelihood	-1626.344
Hannan-Quinn criter.	5.959921	F-statistic	42.22690
Durbin-Watson stat	2.398245	Prob(F-statistic)	0.000000

Source: Own estimations using EViews.

Table 6. EViews Output – Redundant Fixed Effects Tests

Redundant Fixed Effects Tests
Equation: Untitled
Test period fixed effects

Effects Test	Statistic	d.f.	Prob.
Period F	2.715005	(19,537)	0.0001
Period Chi-square	51.365109	19	0.0001

Period fixed effects test equation:
Dependent Variable: SHECO
Method: Panel Least Squares
Date: 09/13/20 Time: 19:51
Sample: 1996 2015
Periods included: 20
Cross-sections included: 28
Total panel (balanced) observations: 560

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	56.66321	2.452098	23.10805	0.0000
IEF	-0.139294	0.038971	-3.574270	0.0004
HDI	-27.11226	3.352747	-8.086583	0.0000
GE	-5.619194	0.392682	-14.30980	0.0000

Root MSE	4.623297	R-squared	0.598507
Mean dependent var	19.50534	Adjusted R-squared	0.596341
S.D. dependent var	7.302996	S.E. of regression	4.639898
Akaike info criterion	5.914379	Sum squared resid	11969.93
Schwarz criterion	5.945293	Log likelihood	-1652.026
Hannan-Quinn criter.	5.926450	F-statistic	276.2773
Durbin-Watson stat	2.491206	Prob(F-statistic)	0.000000

Source: Own estimations using EViews

The correlation matrix is presented in Table 7. *EViews - Correlations*.

Table 7. EViews – Correlations

	GE	HDI	IEF	SHECO
GE	1.000000	0.452753	0.621605	-0.706606
HDI	0.452753	1.000000	0.616039	-0.587393
IEF	0.621605	0.616039	1.000000	-0.617846
SHECO	-0.706606	-0.587393	-0.617846	1.000000

The output was also generated using the *Robust Least Squares* method and the results are presented in Table 8. *EViews Output (Robust Least Squares).*

Table 8. EViews Output (Robust Least Squares)

Dependent Variable: SHECO
Method: Robust Least Squares
Date: 09/13/20 Time: 19:32
Sample: 1996 2015
Included observations: 560
Method: M-estimation
M settings: weight=Bisquare, tuning=4.685, scale=MAD (median centred)
Huber Type I Standard Errors & Covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	56.91051	2.466206	23.07614	0.0000
IEF	-0.184952	0.039196	-4.718692	0.0000
HDI	-23.74868	3.372036	-7.042830	0.0000
GE	-5.656503	0.394941	-14.32241	0.0000

Robust Statistics

R-squared	0.569913	Adjusted R-squared	0.567593
Rw-squared	0.672655	Adjust Rw-squared	0.672655
Akaike info criterion	525.6112	Schwarz criterion	544.3703
Deviance	10161.12	Scale	4.424485
Rn-squared statistic	849.7462	Prob(Rn-squared stat.)	0.000000

Non-robust Statistics

Mean dependent var	19.50534	S.D. dependent var	7.302996
S.E. of regression	4.652034	Sum squared resid	12032.63

Source: Own estimations using EViews

List of graphs and tables

Tables

Graphs

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Innovative models to revive the global economy
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Assessment of the Nexus between the Banking System and Government Debt Market: Past Trends and Future Challenges

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Abstract

Owing to their capacity to stabilize the market, especially during turbulent times, banks can act as a buffer through an adequate mix of financial operations. Among them, of particular importance are the purchases of government debt securities. Nowadays, banks are being increasingly exposed to the debt securities issued by their own national governments, involving higher risks and weakening the banking system as such. Some national banks acknowledge there is a high risk of intensifying the link between the banking sector and the public sector due to increased direct exposures, represented by debt securities issued by the state and purchased by banks and by the loans provided to central/local governments. Against this background, the paper aims to analyse the situation from the issuer (government) and investors' (banks and their balance sheets) standpoint, by considering selected case studies (the Czech Republic, Hungary, Poland and Romania). In our considerations, we shall use the most recently available data on the bank holdings of debt securities issued by national governments, provided by the ECB database.

Keywords: government debt, commercial banks, balance sheets, banking system, Covid-19 pandemic.

JEL Classification: E52, G21, H63

1. Introduction

The World Bank and IMF handbook (2001) have emphasized that commercial banks invest in government securities in order to meet liquid asset requirements,

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obtain a stable interest income to offset other more volatile investments, manage their short-term liquidity, and take positions on the future movement of interest rates. Commercial banks also use their government debt holdings to hedge their interest rate positions for repo transactions. However, commercial banks should not be forced to hold government securities. Heavy investments in government securities by commercial banks may reflect a weakness in their primary function which is lending.

This paper aims at presenting research findings on the role of government debt securities in the balance sheets of the central banks of four selected countries (the Czech Republic, Hungary, Poland, Romania) since 2007. The major focus is given to the year 2020 and the initial changes triggered by the outbreak of the COVID-19 pandemic.

The paper starts with an investigation of the benefits and risks taken on by banks as major investors on the government debt market. Next, it offers an analysis of government securities in banks' balance sheets covering a timeframe from 2007 to 2019. Particular attention is given to the presence of the banking sector in the government debt market during the Covid-19 pandemic (data from January-May 2020) for the selected cases. Finally, concluding remarks provide an analysis into the short- and medium-term consequences of the persistent interplay between the banking sector and the government debt market.

2. Problem Statement

The interplay between the banking system and the state, through banks' holding of government debt, is a largely debated issue and, against the background of the current global pandemic, it comes at the forefront of public and academic concerns.

At the root of this debate is the fact that Euro-area prudential regulation mechanism allows banks to assign a zero-weight to government debt held in their portfolios and hence to charge no additional capital for it. A direct consequence of this preferential regulatory treatment of banks' exposures to government debt is represented by banks' increased interest in purchasing and holding these financial instruments in their portfolio rather than other types of assets with various degrees of riskiness.

There is a large strand of literature that notices the concentrated exposure of banks in many countries across Europe to their own sovereign, by focusing on specific issues of interest. For instance, Gros (2017) starts from the belief that banks should be allowed to buy large amounts of their own sovereign in order to contribute to stabilizing the market during a crisis episode and explains why such reasoning is erroneous. Therefore, it is recommended that banks are discouraged from holding too much domestic government debt and that governments change the category of investors they are targeting for financing large public debts.

Some recent empirical research conducted by CESIFO (Saka, 2019) on a large bank-level dataset covering the entire Eurozone crisis outlined that this crisis had caused the reallocation of government debt from foreign to domestic banks. The explanation brought up by several other studies is twofold: i) governments have

imposed on to banks in their jurisdiction to expand their exposure on government bonds and hence to finance the state (Becker and Ivashina, 2018; De Marco and Macchiavelli, 2015); ii) the widespread belief that the state is less willing to default if sovereign debt is mainly held by domestic banks rather than foreign ones (Broner et al., 2010; Gennaioli et al, 2014). Evidence shows an informational friction. In normal times, the level of government debt held by domestic and foreign banks is balanced, while during financial or economic crisis episodes, it is noticed that foreign banks' access to real time information regarding the true repayment capabilities of the governments becomes of utmost importance.

Most studies identify the occurrence of risks and vulnerabilities for those banks which are heavily exposed to government debt. Pagano (2016) uncovers that in the aftermath of the 2008 global financial crisis, banks' exposures to domestic sovereign risk, due to holdings of government bond, have amplified the transmission of stress to the banking system. The author explains that the increased sovereign risk caused the market value of government bonds to drop, which further triggered equity losses for banks, amplified their default risk and their funding costs. A conclusion is that large domestic sovereign exposures of banks operating in fiscally vulnerable countries (such as those in the Euro-area periphery) can exacerbate the impact of the sovereign stress, the volatility of bank risk and lending.

A similar conclusion is reached by Altavilla et al. (2016), who claim that in stressed Euro-area countries, the banks exhibiting the largest exposure to the sovereign experienced significant increases in the solvency risk, sharper reductions of their lending activity and more pronounced rises of their lending interest rates than the less exposed banks. There is found a direct relationship between the drop of government bonds' price and the decreases in the loan growth rate.

Cooper and Nikolov (2018) explore the "diabolic loop" established between the government and the banking system and warn about potential bank solvency vulnerabilities. The authors argue that low confidence in governments' capabilities decreases the market value of government bonds, a trend that has a negative impact on banks' balance sheets and threatens their future solvency. In case a large-scale bank failure occurs, the government will provide incentives for bailing it out in order to prevent a costly default. The tight interplay between the government and banks is fuelled by banks' desire to hold riskless government debt, rather than issue sufficient equity to protect their own solvency and depositors against potential loss.

Other studies (e.g., Gennaioli et al., 2014) document too the dangerous link between the sovereign and the banking system, arguing that a government default may severely impact banks' balance sheets, generating a decrease in lending to the real economy, a decline in overall economic activity, and even lead to a banking crisis. Gennaioli et al. (2018) rely on a broad sample of 20,000 banks in 191 countries and 20 sovereign default episodes, to perform an in-depth analysis on the role played by large sovereign exposures during sovereign defaults. The findings indicate that banks tend to hold a large share of government bonds in normal times, particularly those banks which grant fewer loans and operate in less financially-

developed countries. In times of sovereign default years, the financial behaviour of banks holding an average exposure to government bonds reports a change, implied by a lower growth rate of loans.

Another debated belief is related to the particular involvement of undercapitalized banks in purchasing government bonds, in order to take advantage of the zero risk-weight assigned to domestic sovereign exposures or to increase profitability with no risk taking. Lamas and Mencía (2019) took it off from this assumption and verified the validity of this statement empirically. They discovered that poorly capitalized banks are not associated with higher holdings of domestic sovereign bonds, neither had they taken advantage of the depressed financial market conditions to expand their portfolios of government bonds.

Chronopoulos et al. (2019) have focused on identifying the set of leading factors lying at the root of bank holdings of own government debt and relied on a dataset of 295 banks in 35 countries. Their findings indicate that the main determinants are represented by the structure of bank ownership (domestic, foreign, or government ownership), the quality of bank governance, and the level of the country's financial development. An interesting conclusion is that banks' home bias in holding government debt is widely spread, being considered an international phenomenon, owing to a mix of both bank-specific and country-specific factors.

3. Aims of the Research

Having as the starting point the literature overview abovementioned, our paper aims at bringing a fresh perspective on the nexus between the government and the banking sectors in four Central-Eastern European countries, by investigating the evolution of banks' exposure to government debt and putting particular emphasis on the current distress period represented by the Covid-19 pandemic crisis.

4. Research Methods

The major method applied in the quantitative research is a statistical and comparative analysis based on the ECB database (Statistical Data Warehouse). The analysis takes into account the data on the general government sector (GG) and monetary financial institutions (MFIs) in accordance with the ECB methodology and Eurostat.

5. Findings

In the years 2007-2019, public debt in the four selected countries was on the rise. In Hungary only, the public debt figure was above the EU criterion of 60% of GDP. Nonetheless, the biggest difference between 2007 and 2019 was reported in Romania, and the smallest in Hungary. In terms of the average debt against GDP, the countries under investigation ranked as follows: Hungary, Poland, Czech Republic, and Romania (Table 1).

Table 1. Government debt (in percentage points)

	Czech Republic	Hungary	Poland	Romania
2007	27.5%GDP	65.7%GDP	44.5%GDP	11.9%GDP
2019	30.8%GDP	66.3%GDP	46.0%GDP	35.2%GDP
dynamic (2007-2019)	3.3	0.7	1.5	23.3
average level (2007-2019)	36.4	74.7	50.8	31.0

Source: Own calculations based on ECB data

MFIs played a significant role on the government debt market. In the countries under investigation, the share of MFIs as investors in debt portfolio oscillated between 20% and 50% on average.

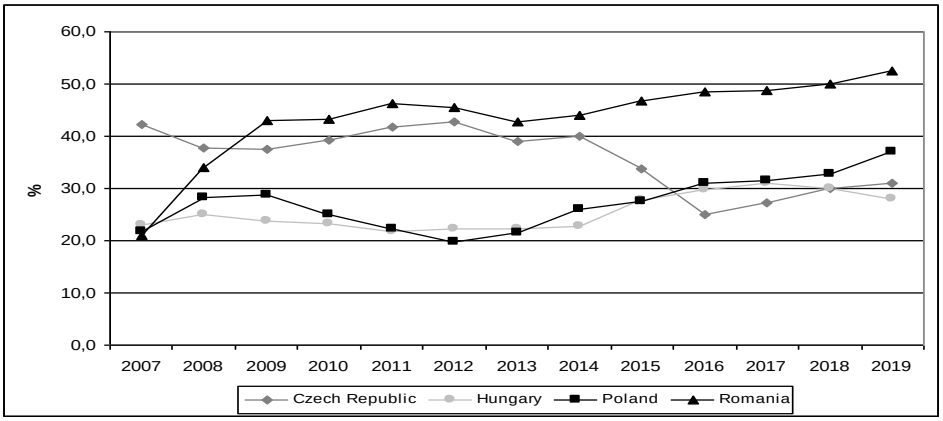


Figure 1. Share of MFIs in government debt as investors
Source: Own calculations based on ECB data

Monthly data for 2007 - May 2020 indicate an increase in the value of government securities in MFIs assets (Figure 2). Particularly interesting is the systematic growth of the balance sheet position in Poland after 2012. Similarly, after its accession to the EU, Romania reported an increase in the nominal value of government bonds purchased by banks, too. In March-May 2020, Poland and Romania reported relatively the highest increase in MFIs activity on the debt market and, historically, the highest level of this balance sheet position.

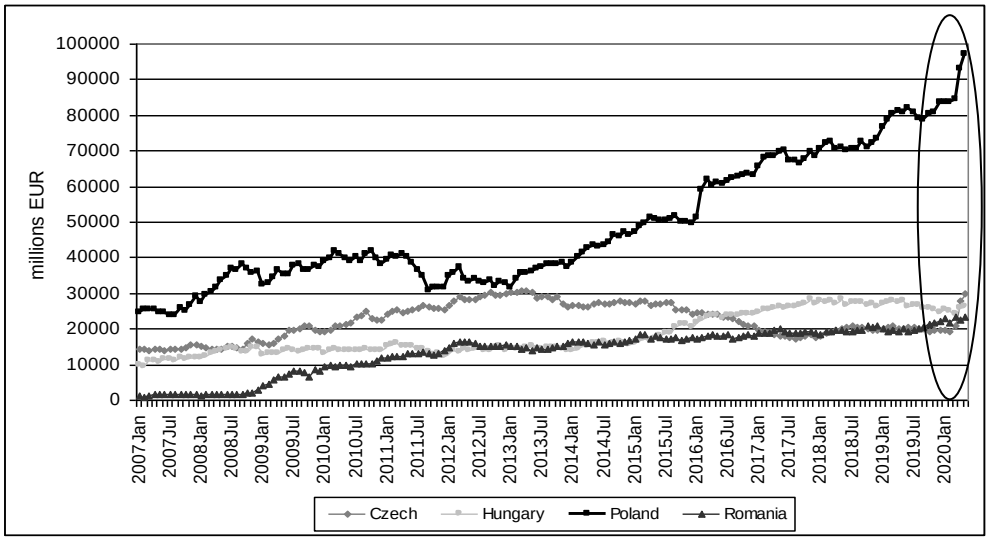


Figure 2. Holdings of debt securities issued by domestic General Government reported by MFIs excl. ESCB (nominal stock)
Source: ECB database

Since April 2020, in three out of the four countries under investigation, the gap between growth rates of loans to residents total and holdings of government debt by MFIs remained negative (Table 2). This means that the government debt securities growth was more dynamic than the growth of total loans granted by MFIs. It was noticed that the gap was positive in Hungary only.

Table 2. Gap between loans to domestic residents total and holdings of government debt by MFI (in percentage points)

	Czech Republic	Hungary	Poland	Romania
2020 Jan	9.5	17	-1.7	-3
2020 Feb	12.3	16	0.4	-2.2
2020 Mar	2.7	17.7	-0.9	-6.1
2020 April	-42.5	13.8	-13.8	-8.1
2020 May	-42.4	16.1	-19.7	-5.7

Source: Own calculations based on ECB data

It is noteworthy that the share of loans granted to the general government sector by MFIs also began to grow steadily (with a growing trend notably visible in Romania). This might signify the increased engagement of MFIs in financing the government with all the financial instruments available (Table 3).

Table 3. Share of loans to government in total loans to domestic residents in MFI balance sheets (in percentage points)

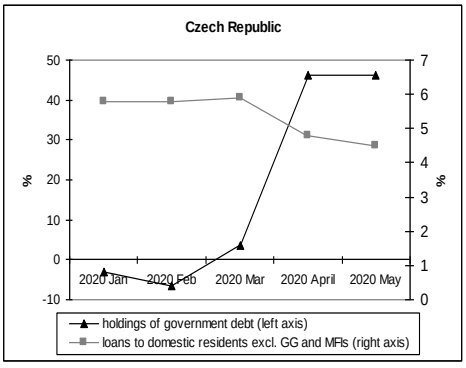
	Czech Republic	Hungary	Poland	Romania
2020 Jan	0.8	3.2	6.1	2.9
2020 Feb	0.8	3.3	6.1	3.0
2020 Mar	0.9	2.9	6.0	4.2
2020 April	0.9	2.9	6.0	5.6
2020 May	1.0	3.0	6.2	5.7

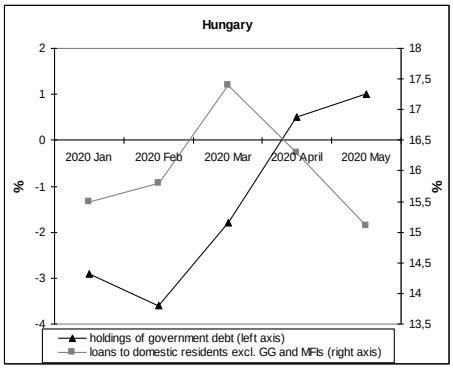
Source: Own calculations based on ECB data

The outbreak of the COVID-19 pandemic resulted in the lock-down of the economies under analysis and many other economies across the world. The period from March to May 2020 reflects an economic stagnation. As a result, economies worldwide require huge financial support. The major role in this respect should be played by MFIs.

As analysis findings show, the beginning of the COVID-19 pandemic saw the reversed trends between the dynamics of maintaining government securities and granting loans to entities other than public and financial ones. In each of the countries under analysis, March or April marked the beginning of the trend change (Figure 3). Partially, this circumstance was brought about by the restrictions under which many businesses and financial institutions were closed, further exacerbated by the immobility of the society.

Today, it is essential to carry out further analyses into the trends under discussion as maintaining or aggravating the trends over the months to come could threaten both the economy and the banking sector itself.





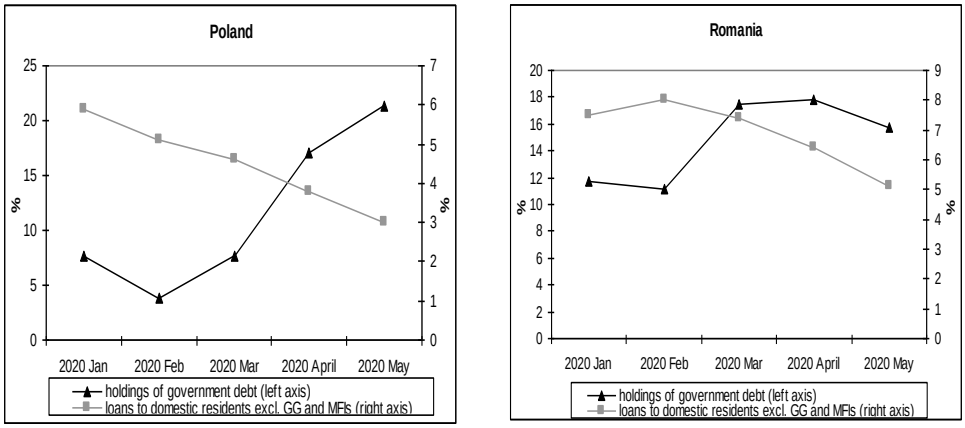


Figure 3. Growth rate of holdings of government debt by MFIs versus loans to domestic residents (excl. GG and MFI)

Source: ECB database

6. Conclusions

Following the example of the European Central Bank, which launched the Public Sector Purchase Programme in 2015 and the Pandemic Emergency Purchase Programme in March 2020, the central banks of the states outside the Euro zone also intensified the purchase of government securities. Thus, commercial banks are now becoming increasingly engaged in operations involving central banks.

As the analysis findings reveal, since the outbreak of the previous financial crisis in 2008, most of the countries under analysis demonstrate a growing trend in relation to both the nominal value of government debt and the role of banks in the government debt market. This means that in that respect, the countries were not well prepared to face the current crisis.

The findings of the research carried out at the beginning of the pandemic crisis (i.e. March-May 2020) in selected CEE countries signal a number of initial problems that can be exacerbated by the financial and economic impact of the pandemic in the months to come. The European Commission forecasts an average drop in GDP across the EU by 7.5% and an increase of public debt of as much as 95% of GDP (EC, 2020). These forecasts alone are a good reason to carry out further observations in this respect.

The growing gap in the countries under research might imply an increased risk of MFIs being excessively involved on the debt market which translates into reducing the basic function of banks, i.e. granting loans to the non-government sector.

References

[1] Altavilla, C., Pagano, M., and Simonelli, S. (2016). *Bank Exposures and Sovereign Stress Transmission*, Working Paper 11, European Systemic Risk Board.

[2] Becker, B., Ivashina, V. (2018). Financial repression in the European sovereign debt crisis, *Review of Finance*, 22, pp. 83-115.

[3] Broner, F., Martin, A., Ventura, J. (2010). Sovereign risk and secondary markets. *The American Economic Review*, 100, pp. 1523-1555.

[4] Chronopoulos, D. K., Dotsis, G., Milonas, N. T. (2019). International Evidence on the Determinants of Domestic Sovereign Debt Bank Holdings, *J Financ Serv Res*, https://doi.org/10.1007/s10693-019-00326-4.

[5] Cooper, R., Nikolov, K. (2018). Government debt and banking fragility: the spreading of strategic uncertainty, *International Economic Review*, 59(4), pp. 1905-1925.

[6] De Marco, F., Macchiavelli, M. (2015). *The political origin of home bias: The case of Europe*, available at SSRN 2441981.

[7] European Commission, (2020), Communication from Commission, 2020 European Semester: Country-specific recommendations, COM(2020) 500 final.

[8] Gennaioli, N., Martin, A., Rossi, S., (2014). Sovereign default, domestic banks, and financial institutions, *Journal of Finance*, 69, pp. 819-866.

[9] Gennaioli, N., Martin, A., Rossi, S., (2018). Banks, government Bonds, and Default: What do the Data Say? *Journal of Monetary Economics*, 98 (2018), pp. 98-113.

[10] Gros, D. (2017). Banks as buyers of last resort for government bonds?, *CEPS Policy Insights*, No 2017/43, November 2017.

[11] Lamas, M., and J. Mencía (2019). What drives sovereign debt portfolios of banks in a crisis context? *Working Paper*, Series No 88/March 2019.

[12] Pagano, M. (2016). The sovereign-bank nexus and the case for European safe bonds, *European Economy* 2016.

[13] Saka, O. (2019). Domestic Banks as Lightning Rods? Home Bias and Information during the Eurozone Crisis, *CESifo Working Paper*, No. 7939, Category 7: Monetary Policy and International Finance.

[14] The World Bank and International Monetary Fund (2001). *Developing government bond market. A handbook*, Washington D.C.

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Terrorist Networks as Social Networks

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Abstract

Terrorism remains one of the most stringent socio-economical threats these days, which is why efforts to detect and contain these types of manifestations should not be speared. At the same time, resources have to be allocated efficiently, thus a deeper knowledge on how terrorist networks form and function may be very beneficial in destabilizing those networks and thus preventing terrorist acts. In this paper, we will use the concept of social network analysis and analyse the March 11th bombings in Madrid. Conclusions show that even though the current situation points to mostly separatist terrorism taking place, some of the bloodiest episodes in the recent history of Spain rooted in jihadist terrorism. Efforts should be made in closely surveilling places that are known to be of interest for already known terrorists, as well as monitoring the ties of each individual and mapping potential terrorist networks.

Keywords: Game Theory, Social Network Analysis, Terrorism, Madrid bombings.

JEL Classification: C71, F51, F52

1. Introduction

Although terrorism has become a worldwide phenomenon, no consensus has been reached as to how exactly terrorism can be defined. One of the reasons for this variety of definitions may be explained by the fact that terrorism itself can be split into more than one category. When looking at the motivation that lies behind the actual attack and what is hoped to be obtained by carrying it out, in the literature we found these four most common types of terrorism: jihadist terrorism, ethno-nationalist and separatist terrorism, right-wing terrorism as well as left-wing and anarchist terrorism.

Considering Spain with its March 11th bombings in Madrid as a case study, we look how starting from the predominance of a certain type of terrorism in a country

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and the analysis of known terrorist cells can terrorism be predicted and eventually prevented from taking place.

In the following, section 2 is a short review of the literature on game theory and its use with respect to terrorism, with special focus on terrorist networks and social network analysis. In the next section, we present the methodology on which the case study presented in section 4 is based. Conclusions are presented in section 5.

2. Problem Statement

Studies on terrorism are to be found since the early 80s, but the subject has become significantly more discussed and addressed in the scholarly literature after the attacks from September 11th. Since then, the number of studies regarding terrorism and its consequences has considerably increased.

There are plenty of directions for studies in the literature, from which we recall only some: theoretical and empirical articles on the most suitable methodology for analysing terrorism: game theory or statistical analysis; the types of antiterrorist countermeasures a state can take: proactive measure or reactive ones; the structure of terrorist networks combined with the theory of social network analysis and the theory of graphs; and last, but probably the most offering field is that of researches on the economic consequences of different types of terrorism.

When talking about literature on terrorism, we cannot but mention Todd Sandler and Daniel Arce. They are authors with most contributions in this field of study, their focus being mostly on the game theoretical approach of terrorism. Most of their articles are oriented on the game theoretical approach of terrorism. In the paper called "Counterterrorism. A Game-Theoretic Analysis" (2005), they tackle the subject of which type of measures a government should take against terrorism: proactive or reactive. In order to establish this, they evaluate the costs and benefits of each of the alternatives. In his paper from 2004, Sandler describes deterrence races. In order to overthrow the actions of terrorists, each country makes deterrence effort. The results point to the fact that if the efforts of the players are not coordinated, it might lead to too high costs, whereas if they decide to cooperate instead of trying to deflect terrorism for themselves, the results are better for all nations.

Zimmerman (2011) puts terrorism in the context of globalization. His paper emphasizes on the potential for growing terrorism in the context of globalization as well as the relation between it and immigration. The assumption the study is based upon is that globalization can change opportunity costs. In the article, globalization is defined as an increase in exchanges of goods, persons as well as ideas. Considering that terrorism is based on asymmetric information, we might have to wonder if terrorism has increased by growing international commerce, by the movement of people or by the large scale dissemination of ideas. The author concluded that even though globalization may have contributed to international terrorism, but it is not a determining factor of it.

Another direction of study relates to modelling terrorist networks as social networks. This implies the use of social network analysis. The method is useful in

order to determine the most important individual inside a social network. Since the importance of a person inside a group is relative, more than one variation of centrality measures should be used.

Lindelauf, Hamers and Husslage (2013) model terrorist networks as social networks and apply a network game. In the article, it is pointed out that identifying key players inside a network enables for an easier destabilization of the network. In this way, resources can be allocated more efficiently in the battle against terrorism, only towards the most important terrorist players. As a measure of a player's power inside a network, Shapley value is used. Their model allows also for assessing non-network related factors. The methodology used allows for a hierarchy of terrorists inside the network, and two case studies are used: Bali bombings from 2002, as well as the September 11th Al Qaeda attack.

Besides scientific researchers, there are also regulated authorities that oversee the phenomenon of terrorism. Their object of activity is to study in order to prevent terrorist acts from happening. At European level, Europol is the organism in charge with supervising the prevention and evolution of criminal activities. Its purpose is fighting against European criminality, by taking over the responsibilities of the national police of each member state, in case a crime expands outside the borders of one country. Each year, this organization publishes The EU Terrorism Situation and Trend Report (TE-SAT). Its content is based on information supplied by EU Member States, some non-EU countries and the partner organization Eurojust, alongside information gained from open sources.

The main categories of terrorism analysed in the above mentioned report are jihadist terrorism, ethno-nationalist and separatist terrorism, left-wing and anarchist terrorism, as well as right-wing terrorism.

Jihadist terrorism is associated to military movements "rooted in Islam". Ethno-nationalist and separatist terrorism, as the name suggests, is that form of terrorism motivated by nationalism. Nationalist terrorists seek to form self-determination in some form that may vary from gaining greater autonomy to establishing a completely independent, sovereign state. This can be related to a national, religious ethnic or other form of group that has a feeling of oppression or denial of rights, especially rights accorded to others, or it might even manifest in acts of violence against immigrants in a country. The Irish Republican Army (IRA), the Euskadi Ta Askatasuna (ETA) and the Kosovo Liberation Army are such examples. In Europe, the countries that report most terrorist attacks linked to separatist terrorism are the UK (88), France (42) and Spain (7). Right-wing terrorism is a form of terrorism that originates in different right-wing ideologies, most prominently neo-fascism, this being the rarest form of terrorism encountered. Left-wing terrorism is a form of terrorism meant to overthrow conservative or capitalist systems and replace them with progressive, anarchist societies.

Although most of the literature about Spanish terrorism is focused mostly on ETA, after the Madrid Bombings concerns have also raised in connection with the existence and development of the Spanish Al Qaeda Cell, which is sometimes also referred as the network of Syrian origin or Abu Dahdah network. Such papers

include F Reinares' work "Al-Qaeda's Revenge: The 2004 Madrid Train Bombings". This book has two parts: one focusing on the attack's origins, components and formation and the second one on the fact that it was revenge, the strategy for carrying out the attack as well as the opportunity for it taking place. The book presents how it went from the forming of the Spanish AL Qaeda Cell in 1994 to the events from March 11th. Besides the connections to Osama Bin Laden, The Moroccan Islamic Combatant Group was also involved, alongside some common Spanish delinquents that turned into Jihadists on the occasion of the Madrid bombings.

3. Research Questions / Aims of the Research

The terrorist attack from March 11th in Madrid was a series of coordinated bombings targeting the commuter train system. The attack resulted in 191 people dead and around 2000 injured.

The attacks took place 3 days before Spain's general elections. This, combined with the fact that in Spain the most encountered form of terrorism is the ethno-nationalist and separatist, as pictured in Figure 1, led to the immediate first conclusion that responsible for the attack was the terrorist group active in Spain commonly known as ETA. The figures presented in Figure 1 were obtained from 2017 Europol report The EU Terrorism Situation and Trend Report (TE-SAT).

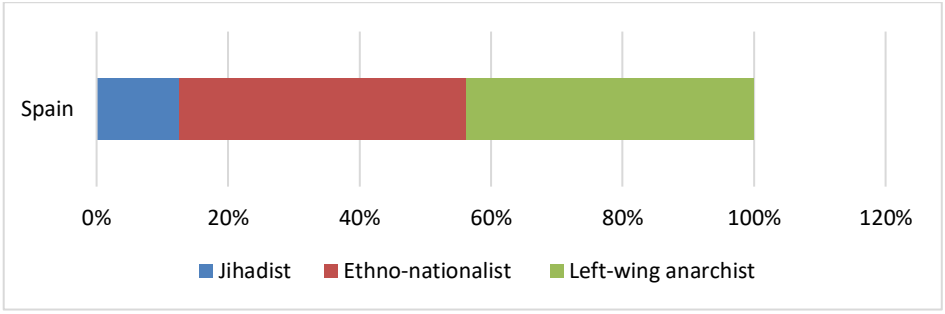

Figure 1. Distribution of types of terrorism inside Spain

Source: Based on 2018 European Union Terrorism and Situation and Trend Report

Nevertheless, after more investigations took place and arrests were made, the situation revealed that the terrorist attack should be classified as jihadist. This will become clearer once we look at how the terrorist network behind the attack was structured.

4. Research Methods

In order to determine the key nodes inside a terrorist network, we will use the theoretical model proposed by Lindelauf, Hamers and Husslage (2013). We will use three centrality measures: degree centrality, betweenness centrality and closeness centrality. These measures will bring important information related to the

hierarchy inside an organization, even though they do not count for non-network related information.

A social network is mathematically presented as a graph G = (N, E), where N = {1, …, n} denotes the set of players. The set of unordered pairs of players {i, j} denotes a network g. Each pair denotes a link between the two players. The set of all links defined on N determines the set of edges E.

The *normalized degree centrality* stands to argue that the more connected a person is, the more important that person is likely to be. The normalized degree centrality of the person *i* is expressed as the fraction of the network with which the person *i* is directly related:

$$C_{degree}(i) = \frac{d(i)}{|N|-1} \quad (1)$$

where:
d(i) is the number of direct relations of the person *i*;
$|N|$ is the total number of persons in the network.

The following inequality should verify: $0 < C_{degree}(i) < 1$

Betweenness centrality is based on the idea that a person is more important when it enables connections between other persons in the network. It is measured by counting the number of shortest paths (short path equal to minimum number of links) between two persons that pass through another person. Let s_{kj} denote the total number of shortest paths between the person *k* and *j* and let s_{kij} denote the number of shortest paths between *k* and *j* that pass through person *i*. The normalized betweenness centrality of person *i* can be defined as:

$$C_{between}(i) = \frac{2}{(|N|-1)(|N|-2)} * \sum_{k,j \in N\{j\}, k<j} \frac{s_{kij}}{s_{kj}} \quad (2)$$

The following inequality should verify: $0 < C_{between}(i) < 1$

Closeness centrality measures the distance from a certain person to all other persons in the network, where l_{ij} is the shortest distance between persons *i* and *j*. The normalized closeness centrality of person *i* is defined as:

$$C_{close}(i) = \frac{|N|-1}{\sum_{j \in N} l_{ij}} \quad (3)$$

The following inequality should verify: $0 < C_{close}(i) < 1$

Results obtained by applying the above described indicators are not relevant as standalone values, but for the rankings they allow inside a given network.

An enhancement to the centrality measures above can be brought by using networks where either links or certain nodes are assigned weights, namely weighted networks. Nevertheless, through this approach, only the structure of the

network is taken into consideration, not allowing for additional information to be embedded.

$$v(S) = \begin{cases} 1 & if\ S_G\ is\ connected \\ 0 & otherwise \end{cases} \quad (4)$$

When we have relevant information regarding certain relationships between players, then the focus can be shifted on the most relevant connections inside the group, making a weighted connectivity game most appropriate.

On the other hand, when we have relevant information regarding certain persons inside the network, as will be the case with our case study, a weighted connectivity game using information about individuals should be applied. In this case equation (4) becomes:

$$v^{individual}(S) = \begin{cases} \sum_{i \in S} w_i & if\ S_G\ is\ connected \\ 0 & otherwise \end{cases} \quad (5)$$

where w_i is the weight assigned to person *i* inside the network.

In order to allocate the power inside coalitions, the Shapley value is used. This allocation rule is based on the marginal contribution of a player inside a certain coalition. The Shapley value of player *i* is defined as per below:

$$\varphi_i(v) = \sum_{S \subseteq N, i \notin S} \frac{|S|!\,(|N|-1-|S|)!}{|N|!} * [v(S \cup \{i\}) - v(S)] \quad (6)$$

5. Findings

In order to apply the methodology described in the previous section, for the Madrid bombings some steps are necessary.

We need to obtain the network to be analysed, this being the input in our model. In order to obtain a graphic visualization of the terrorist network involved in the March 11th bombings in Madrid, we used information from Memon et al. (2008) combined with information from the article Jihadist Radicalization and the 2004 Madrid Bombing Network published by the Combating Terrorism Centre.

According to data obtained during the investigation, the terrorist network behind the attack was formed between March 2002 and November 2003 by the decision to coalesce of four relatively small groups. Two of the groups were interconnected because they evolved from the remnants of an Al Qaeda cell established in Spain around 1994. This cell was led by the Syrian-born Imad Eddin Barakat Yarkas, better known as Abu Dahdah, network that was partially dismantled after the 9/11 incident. A third cluster of individuals who eventually became part of the network was linked to the Moroccan Islamic Combatant Group (GICM), which established structures across Western Europe in the 1990s, particularly in France and Belgium. The fourth cluster was initially composed of a criminal gang active throughout Spain and specialized in illicit trafficking of drugs and stolen vehicles.

As compared to the one presented by Memom et al. (2008), Figure 2 presents the simplified version of the network, focusing mainly on the four clusters that were identified as involved in the attack. The main nodes are the ones represented by each cluster and a weight is assigned to each cluster based on how many of the known terrorists mentioned also by Memom were belonging to each cluster and how well connected they were to the other participants. Given this information, we will apply (5) in the following.

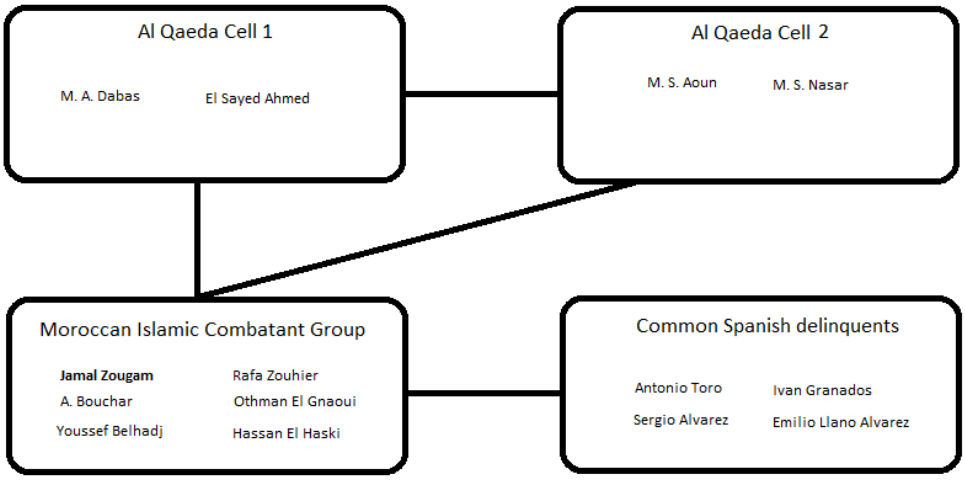

Figure 2. Simplified Terrorist Network for March 11th bombings in Madrid

As a last step, we analyse the rankings obtained by each cluster, which represent the output of the applied model. A comparison between standard centrality measures and game theoretical centrality measures should be performed.

Table 1. Weights assigned to clusters

Cluster	Weight
Old Al Qaeda faction 1	2
Old Al Qaeda faction 2	2
Moroccan Islamic Combatant Group	4
Common Spanish delinquents	1

Centrality measures presented in Table 2 were obtained using the theoretical model described in the previous section.

Table 2. Centrality measures

Cluster	Degree	Betweenness	Closeness	Individual Weight
Old Al Qaeda faction 1	0.667	0.333	0.750	5.097
Old Al Qaeda faction 2	0.667	0.333	0.750	5.097
Moroccan Islamic Combatant Group	1.000	1.000	1.000	10.195
Common Spanish delinquents	0.333	0.000	0.600	2.549

Given the results for all three indicators, it is obvious that the determining factor in the attack from Madrid was the involvement of the persons from the Moroccan Islamic Combatant Group and that the contribution of Spanish men was only minimal and it was only related to suppling some of the materials from which the bombs were made.

Most of the men involved were of Moroccan origin, being economic immigrants with both legal and illegal residence documents. Even though the incident was considered one of home-grown terrorist, the involvement of the two minor al Qaeda remnant cells proves that there were also international ties to terrorism, so the statement cannot be considered entirely true.

A general fact about terrorism that proves to be also the case in this situation is that the people attracted into these kinds of acts are recruited through many channels. For the case of Spain, it happened mostly in mosques, worship sites, countryside gatherings and private residences where most of the members of the Madrid bombing network adopted extremist views but few also adopted a violent conception of Islam while in prison.

6. Conclusions

Even though analysing data from 2017 it seems that Spain is mostly affected by ethno-nationalist incidents or by left-wing anarchism, one of the bloodiest incidents in the history of the countries seems to be mostly tied to jihadism. This proves once more the volatile nature of terrorism occurrence.

By applying a theoretical model, we confirmed the results of the investigations. Unfortunately, most of such analysis can be done for now only after the event occurs, but in time, with the use of newer models and permanent training of those models, we could get even predictions of terrorist behaviour.

This is why it is important for more effort to be directed towards the study of the terrorist cells, because if the formation of such groups can be prevented, the chance of emerging attacks that have high impact on the population decreases.

Moreover, places known to spread such beliefs, as well as the already known connections of terrorism, suspects should be mapped and closely followed, since any knowledge into this type o terrorist network might help preventing an attack.

References

[1] Lindelauf, R. H. A., Hamers, H. J. M., Husslage, B. G. M. (2013). Cooperative game theoretic centrality analysis of terrorist networks: The cases of Jemaah Islamiyah and Al Qaeda, *European Journal of Operational Research*, 229, pp. 230-238.

[2] Memon, N., Larsen, H. L., Hicks, D. L., Harkiolakis, N. (2008). Detecting Hidden Hierarchy in Terrorist Networks: Some Case Studies. *Conference: Intelligence and Security Informatics*, IEEE ISI 2008.

[3] Arce, D., & Sandler, T. (2005). Counterterrorism. A Game-Theoretic Analysis, *Journal of Conflict Resolution*, 49(2), pp. 183-200.

[4] Sandler, T., and Enders, W. (2004). An Economic Perspective on Transnational Terrorism, *European Journal of Political Economy*, 20(2), p. 302.

[5] Reinares, F. (2020). *Al-Qaeda's Revenge: The 2004 Madrid Train Bombings*. Columbia University Press, 2016, retrieved from www.jstor.org/stable/10.7312/rein70454. Accessed 8 Sept. 2020.

[6] Zimmermann, E. (2011). Globalization and terrorism, *European Journal of Political Economy*, 27, pp. S152-S161.

[7] European Union Terrorism and situation and Trend report (2018), accessed via https://www.europol.europa.eu/tesat-report.

[8] Jihadist Radicalization and the 2004 Madrid Bombing Network, retrieved from https://ctc.usma.edu/jihadist-radicalization-and-the-2004-madrid-bombing-network/.

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Auditing Practices during Pandemic Times – Implications, Prospects and Leading Factors

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Abstract

The paper subscribes to a current concern related to audit profession and auditing practices during pandemic times and has a two-fold objective. The first one gravitates around performing a review of the recent official opinions in the field of audit and corporate governance and its contribution to the overall economic indicators. The second objective aims at identifying the institutional, regulatory, economic and financial environment indicators that may exert an impact on the strength of auditing and reporting standards, to uncover whether country-specific environments contribute to strengthening the quality of audits. The empirical analysis comprises 28 European countries, covering a timeframe from 2000 to 2019 and relies on a panel regression framework. The set of explanatory variables considered comprises: i) a financial environment proxy, represented by the Index of Financial Stress; ii) an economic development variable, represented by GDP per capita growth rate; iii) country governance indicators, such as the political stability, the regulatory quality, the control of corruption and the economic policy uncertainty. A dummy variable related to the status of a country's membership to the Euro-zone will be also tested, to reveal whether the strength of auditing and reporting standards is determined by the country's membership to this group. Another dummy variable included in the analysis is related to the occurrence of the 2008 global financial crisis and is meant to serve as a proxy for another global turmoil time, similar to the one witnessed at present. The conclusions will allow us to formulate some remarks and expectations regarding the potential impact of the pandemic on the strength of audit standards and the potential challenges that may arise in the future for this profession.

Keywords: Audit profession, auditing standards, pandemic, panel regression.

JEL Classification: C23, M42, M48

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1. Introduction

The auditor's responsibility is to obtain sufficient and appropriate evidence before issuing the auditor's report on the financial position and performance of the companies operating in certain business environments. In other words, auditor's report provides evidence that the financial report presents a true and fair view of a company's financial position and performance. The auditing practices usually have been considered the most relevant surveillance mechanism in the process of corporate governance because all business decisions are based on the information presented in financial statements. If the auditing practices are failing, then all other research and findings about the financial position and performance of the companies are under the question.

Despite of the fact that all auditors within the European Union are operating under the same financial and auditing standards, there are still many differences in auditing practices among the EU countries. This is due to different factors that go beyond the financial reporting and auditing standards. However, in uncertain circumstances, financial environment, governance indicators and economic development play a crucial role in this process as well.

The aim of this paper is to investigate the influence of several country-specific governance indicators, financial and economic environment indicators on the strength of auditing standards among EU countries. There are many researches finding that financial and economic environment indicators have a strong impact on auditing practices in the EU countries. For instance, it is assumed that better regulatory environment at the national level leads to stronger auditing practices. In addition, active measures in preventing corruption can be translated into stronger auditing practices. At the opposite, economic and legal constrains lead to poor quality of auditing practices. These factors are increasingly more highlighted in the challenging-pandemic times.

2. Auditing in the context of financial environment, governance and economic development indicators

The OECD usually promotes the best world practices. Among other issues of good corporate governance principles, it is presented that the "information should be prepared and disclosed in accordance with high quality standards of accounting and financial and non-financial reporting" (OECD, 2015, p. 42). In other words, investor's protection is critical to efficient capital formation to fund innovation and entrepreneurial risk taking (Doty, 2014.) In that sense, audit can promote long-term capital investment, but to do so, investors must consider it to be relevant and reliable (Doty, 2014). To provide relevant and reliable financial statements, the role of auditing is crucial in that sense. An annual audit should be conducted by an independent, competent and qualified auditor, in accordance with high-quality auditing standards, in order to provide an external and objective assurance to the board and shareholders that the financial statements fairly

represent the financial position and performance of the company in all material aspects (OECD, 2015, p. 43).

Prior studies have identified several factors associated with the economic growth of a country, including a country's: legal system, banking system, stock markets, and accounting standards (Abdolmohammadi, Tucker 2002). The focus of the researchers was to examine cross-country differences in accounting and auditing to assess their role in a country's economic development. Many research papers are focused on the governance indicators and its influence on the strength of auditing and reporting standards (Michas, 2011; Hasanuddin, 2018). These studies aimed at analysing the influence of governance indicators on the integrity of financial statements. However, due to the actual unexpected events, new indicators should be included in the model (Accountancy Europe, 2020). In that sense, the value added by this paper refers to connecting strength of auditing and reporting standards to the financial environment, governance and economic development indicators considered among EU countries.

3. Methodological Insights and Variables Selection

3.1. Variables employed and data sources

In order to comprehensively assess the influence of several country-governance indicators and of financial and economic environment indicators on the strength of auditing standards among EU countries, it has been considered a sample of 8 explanatory indicators, out of which 2 are represented by dummy variables. Details on all indicators employed in the analysis, brief explanations and sources of data can be found in table 1.

Table 1. Variables employed and data sources

Type of indicator	Indicator	Explanation	Source
Audit practices	Strength of Auditing and Reporting Standards Index	The index is computed based on survey responses to the question "In your country, how strong are financial auditing and reporting standards?" The level 1 is extremely weak, while 7 is extremely strong.	World Economic Forum Global Competitiveness Index (Schwab, 2019)
Financial environment	Index of Financial Stress	Financial stress measure computed individually for each EU country, that captures three financial market segments: equity markets, bond markets and foreign exchange markets.	European Central Bank

Type of indicator	Indicator	Explanation	Source
Governance indicators	Political Stability	It measures public perceptions of the likelihood of political instability.	Worldwide Governance Indicators, http://info.worldbank.org/governance/wgi/#home
	Regulatory quality	Public perception of government's ability to design and implement sound policies and regulations.	
	Control of corruption	It reflects public perceptions of the extent to which public power is exercised for private gain.	
	Economic Policy Uncertainty - EU level	It measures the European policy-related economic uncertainty, by counting the frequency of newspaper articles containing the terms uncertain or uncertainty, economic or economy, and one or more policy-relevant terms.	Baker, Bloom, Davis, Measuring Economic Policy Uncertainty
Economic development	GDP per capita growth rate	Gross domestic product divided by mid-year population number; it accounts for a country's economic development or well-being.	Eurostat

Source: Authors

The indicators included in this study are based on theoretical considerations and debates launched by practitioners and economic literature. All of them are investigated now for the first time, in an empirical manner. The first dummy variable is related to the status of a country's membership to the Euro-zone. The analysis will reveal whether the strength of auditing and reporting standards is determined by the country's membership to this group. The dummy variable for the occurrence of the 2008 financial crisis is meant to serve as a proxy for a global turmoil time, similar to the one witnessed at present. The conclusions will allow us to formulate some remarks and expectations regarding the potential effect to be triggered by the pandemic on the strength of auditing standards.

The cross-section sample is represented by twenty-eight European countries, while the time dimension covers the period ranging from 2000 to 2019, data being collected with annual frequency from official databases of various institutions.

The research hypothesis tested below is aimed at uncovering whether a country's auditing practices are determined by the dynamics of the economic, financial and state's governance capabilities.

3.2. Model specification

The empirical analysis employs the panel data regression technique, because our intent is to simultaneously analyse all 28 European countries in the sample, by accounting for both a cross-section and a time dimension. In addition, we benefit from a large number of observations in the initial sample so as to ensure the reliability of estimates. Another reason for using panel regression has its roots in the econometric theory (Roberts & Whited 2012; Wooldridge 2003) which claims that in cases of endogeneity, the statistical accuracy of estimates may be distorted. In our study, there is a source of endogeneity, represented by measurement errors or computational inaccuracies due to the use of proxy variables, such as indexes or other composite indicators used to assess unobservable or difficult to quantify variables.

The general specification of the panel regression model is as follows:

$$\text{Strength of auditing practices}_{it} = \sum \alpha G_{it} + \beta\ \text{GDP per capita}_{it} + \Omega\ \text{Financial stress}_{it} + \text{Dummy}_{\text{euro-zone}} + \text{Dummy}_{\text{financial crisis}} + \varepsilon_{it} \quad (1)$$

where:

$i = 1, 2, \ldots, N$ represents the number of countries in the sample;

$t = 1, 2, \ldots, T$ is the time frame;

Strength of auditing practices $_{it}$ = the dependent variable for the country *i* at the time *t*;

G_{it} = vector of governance indicators;

ε_{it} = the error term.

The panel data regression has been estimated with the Pooled EGLS (Cross-section random effects) method. Hausman Test for Correlated Random Effects indicated that there is presence of random effects. Therefore, the panel regression with random effects best describes our data.

4. Results Obtained and Interpretation

Before running the panel regression, all variables have been tested for collinearity and unit root presence. In addition, in order to gain preliminary information on the statistical features of these time series, a series of descriptive statistics has been computed.

Table 2. Summary of basic descriptive statistics

	Strength of auditing practices	Index of finance. stress	Political Stability	Reg. Quality	Control of Corruption	EPU	GDP per capita	Dummy Euro-zone	Dummy financial crisis
Mean	5.223736	0.14124	71.6304	84.5492	78.0989	172.5391	1.394	0.678	0.18181
Median	5.207961	0.102	71.2600	84.6153	79.6208	167.25	1.600	1	0
Maximum	6.532445	0.57	100	100	100	274.78	23.98	1	1
Minimum	3.886952	0	30.2884	59.13	47.0873	81.22	-14.26	0	0
Std. Dev.	0.638667	0.10977	14.4071	9.59135	15.2205	51.56666	4.148	0.467	0.386
Skewness	-0.08222	1.71771	-0.3227	-0.2129	-0.2509	0.185629	0.470	-0.764	1.64991
Kurtosis	1.926804	6.26431	2.78094	1.99791	1.71119	2.6014	9.246	1.584	3.7222
Jarque-Bera	15.1277	288.210	5.96361	15.2154	24.5487	3.807313	512.1	55.72	146.434
Probability	0.000519	0	0.05070	0.00049	0.00000	0.149023	0	0	0
No. obs.	308	308	308	308	308	308	308	308	308
Cross sections	28	28	28	28	28	28	28	28	28

Source: Authors, based on Eviews

The minimum and maximum values recorded by each variable are two summary statistics with straightforward interpretation: the higher the difference between them, the largest the fluctuations recorded by a variable across given countries and timeframes. The economic policy uncertainty exhibits the larger gap between these statistics, being a sign of ample heterogeneity in the time series values. Political stability, regulatory quality and control of corruption follow a similar pattern of evolution, experiencing however fluctuations across countries. The lowest difference among maximum and minimum levels is recorded for the financial stress index, followed by the audit strength index.

The time series variability feature across time and countries is complemented by the standard deviation statistics, which emphasizes the spread of a time series' values around their mean. Higher levels of standard deviation are associated with greater heterogeneity within the sample. In our case, economic policy uncertainty exhibits the largest deviation (51.56) across all considered countries and time periods, followed by control of corruption (15.22), political stability (14.40) and regulatory quality (9.59). This result indicates that the presence of extreme low or high values is more frequent for these specific variables. At the opposite is the index of financial stress, which records the lowest standard deviation among all considered variables.

The skewness and kurtosis statistics provide additional information regarding the shape of the distribution function. Five time series out of the 9 considered have a kurtosis level below the threshold 3, therefore one can assume that the distribution function is platikurtic and its height is lower than that of a normal distribution. Skewness levels indicate that four time series depict a positive asymmetry, meaning that higher values of the variables are more present in the time series than lower ones. Another five time series (audit practices, regulatory

quality, political stability, control of corruption, Euro-zone dummy) show negative asymmetry and hence lower values are prevailing in the sample.

Table 3 synthesizes the panel estimation results for the model specification, by controlling the countries' degree of economic development (measured as GDP per capita) and membership to Euro-zone.

Table 3. Output of the regression analysis

Dependent Variable: Strength of auditing practices				
Method: Pooled EGLS (Cross-section random effects)				
Cross-sections included: 28				
Total pool (balanced) observations: 308				
Swamy and Arora estimator of component variances				
Cross sections without valid observations dropped				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	1.325796	0.364484	3.637457	0.0003
Index of financial stress	0.488467	0.209806	2.328187	0.0206
Political Stability	0.003789	0.00247	1.533923	0.1261
Regulatory Quality	0.031934	0.00604	5.287388	0
Control of Corruption	0.013983	0.004247	3.292248	0.0011
Economic Policy Uncertainty	-0.00106	0.000337	-3.13277	0.0019
GDP per capita growth	-0.00933	0.00498	-1.8742	0.0619
Dummy Euro-zone	-0.06885	0.10413	-0.66114	0.509
Dummy financial crisis	0.041423	0.053449	0.775005	0.4389

Source: Authors, based on Eviews

The dummy related to the country's membership to the Euro-zone is not statistically significant in relation to the dependent variable, suggesting that auditing and reporting practices are harmonized across countries, no matter they use or not the single currency.

Irrespective of the length considered for the 2008 global financial crisis, namely 2008-2009 or an expanded period of 2008 – 2011, the estimated coefficient for the dummy variable is never statistically significant. Hence, this dummy doesn't exert an impact on the dependent variable audit strength. By extrapolating this result to the actual pandemic crisis implications on the auditing practices strength, it isn't expected to generate a shift in the reliability and soundness of auditing practices.

As regards the threat of systemic risks occurring in the financial system, proxy with the variable index of financial stress, there is a positive relationship between it and the dependent variable, suggesting that in times of financial turmoil the auditing practices tend to be strengthened.

In terms of country's governance indicators, three out of four indicators are highly statistically significant. There is a positive sign between regulatory quality, the control of corruption and the dependent variable. Better and sound state's regulations and increased monitoring and sanctioning of the corruption phenomenon are translated into strengthening auditing practices. The economic policy uncertainty index, as a proxy for people and companies' economic sentiment and belief regarding the actual and future economic policy predictability, is negatively related with the dependent variable. Thus, in times of low uncertainty and increased predictability of economic policies and strategies, the auditing and reporting practices tend to be strengthened by audit companies.

Decreases of economic development and wellbeing, expressed by GDP per capita, further generate a strengthening of audit practices. This result may be explained by relying on the arguments brought by Doty (2014), which claims that the audits have to be as reliable and useful as required and make use of increased professional skepticism in order to consolidate investors' trust and help promoting capital formation for subsequent economic growth and business development, while maintaining cost-effective protection for investors.

Apart from the average value of the intercept computed for all countries in the sample, the effect estimation has computed also an individual intercept for every country, as a deviation from the overall average. Therefore, the results reported for each country are slightly different, due to the intercept value. It appears that in Malta, Austria, Belgium and Hungary, the cumulative impact of all independent variables is more pronounced than in other countries.

5. Conclusion

This paper develops an empirical model examining the influence of different indicators on the strength of auditing and reporting standards among the EU countries. As assumed, the results of panel regressions showed that auditing and reporting practices are harmonized across countries, no matter they use or not the single currency. In terms of country's governance indicators, three out of four indicators are highly statistically significant. There is a positive sign between regulatory quality, the control of corruption and the dependent variable. This means that better quality in state regulations and increased monitoring and sanctioning of the corruption phenomenon are strengthening auditing practices. The economic policy uncertainty index, as a proxy for people and companies' economic sentiment and belief regarding the actual and future economic policy predictability, is negatively related to the strength of auditing and reporting. Thus, in times of low uncertainty and increased predictability of economic policies and strategies, the auditing and reporting practices tend to be strengthened by audit companies. Decreases of economic development and wellbeing, expressed by GDP

per capita, further generate a strengthening of audit practices. However, the significant impact on the indicators can be attributed to the pandemic year. In this context, it is recommended to repeat this research next year. The input data will probably differ due to the pandemic year.

References

[1] Abdolmohammadi, M. J., and Tucker, R. R. (2002). *The Influence of Accounting and Auditing on a Country's Economic Development*, Review of Accounting and Finance, 1(3), pp. 42-53, https://doi.org/10.1108/eb026990.

[2] Accountancy Europe (2020). *Coronavirus virus Impact on Auditing for 2019 Year-ends and Beyond: Analysis of guidance for European Auditors Factsheet*, https://www.accountancyeurope.eu/publications/coronavirus-impact-on-auditing-for-2019/.

[3] Accountancy Europe (2020*). Coronavirus Crises: Country responses to the Implications on reporting*, https://www.accountancyeurope.eu/publications/coronavirus-crisis-coun
try-responses-to-the-implications-on-reporting/.

[4] Doty, J. R. (2014). *The Role of Audit in Economic Growth*, Speech at U.S. Chamber of Commerce The Future of Financial Reporting, Washington, DC, https://dart.deloitte .com/USDART/ov-resource/a2510a49-3f37-11e6-95db-9d1de161569d.html.

[5] Eurostat (2020). Real GDB per capita https://ec.europa.eu/eurostat/web/products-datasets/-/sdg_08_10.

[6] Hasanuddin, H. (2018). The Influence of Good Corporate Governance, and Quality of Audit against the Integrity of the Financial Statements. *International Journal of Economics Management and Social Science*, 1(3), 2018, pp. 111-119, doi:10.32484/ ijemss.v1i3.17.

[7] Michas, P. (2011). The Importance of Audit Profession Development in Emerging Market Countries. *The Accounting Review*, 86(5), pp. 1731-1764. Retrieved September 20, 2020, from http://www.jstor.org/stable/23045586.

[8] OECD (2015). *G20 OECD Principles of Corporate Governance* https://www.oecd.org/ daf/ca/Corporate-Governance-Principles-ENG.pdf.

[9] Roberts, M. R., Whited, T. M. (2012). Endogeneity in Empirical Corporate Finance (October 5, 2012). *Simon School Working Paper*, No. FR 11-29, http://dx.doi.org/10. 2139/ssrn.1748604.

[10] Schwab, K. (eds.) (2019). The Global Competitiveness Report, *World Economic Forum* http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.

[11] Scott, R., Baker, N. B., Steven, J. D. (2016). Measuring Economic Policy Uncertainty, *The Quarterly Journal of Economics*, 131(4), November 2016, pp. 1593-1636, https:// doi.org/10.1093/qje/qjw024.

[12] Wooldridge, J. M. (2003). *Analysis of Cross Section and Panel Data*, The MIT Press, Cambridge, Massachusetts.

[13] World Governance Indicators https://info.worldbank.org/governance/wgi/.

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Romanian Stock Market under Global Pandemic: Do Traders Care about COVID-19 News?

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Abstract

In this paper, we examine the Romanian Stock Market response to the news related to COVID-19 pandemic. Using daily quotes of the BET Index and several other stocks representing certain business sectors, daily returns were found to be impacted by Coronavirus fake news in a negative way, but the effect is weak. Other indices showing news coverage of the virus were not found to be as relevant throughout the daily returns distribution.

Keywords: Coronavirus, Stock Market, Pandemic, News.

JEL Classification: G01, G14, G41

1. Introduction and Problem Statement

Financial markets all over the world are under dramatic impact due to the rapid spread of Coronavirus. Furthermore, the general lock-down measures affected all businesses, leading to a surge in job insecurity, and a lack of basic and essential services. The level of risk present on the financial markets is causing investors to suffer big losses in a short period of time.

The social restrictions also mean that people are now lacking the opportunities to interact and are turning more and more to social media, TV, and other news sources in order to be informed. As most of the topics today are covering Coronavirus, a market-wide sentiment appears, which is subject to "noise", thus making the stock market investors create higher volatility due to "irrational" abrupt portfolio reconstructions (Zaremba et al. 2020).

Current literature showing how COVID-19 pandemic is affecting the financial markets is still limited and generally shows the uncertainty related to the disease: how deadly it really is, whether and when can we get a vaccine, what effects government policies will have, how people will respond (Wagner, 2020), eventually leads to stock market returns decline. Badar (2020) finds that the

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reaction to the increase in the number of deaths is weak, and that stock markets react strongly during early days of confirmed cases. Zhang (2020) also concludes that these reactions are clearly linked to the severity of outbreak in each country. To our knowledge, there is no study tackling the Romanian stock market response to the pandemic.

In this paper, our main objective is to investigate the effects of several COVID-19 news indicators on the Romanian Stock Market, more specifically the BET Index, and further extended to stocks representing different business sectors (banking, pharma, oil & energy, IT & communications, hotels & food). Data spanning from beginning of March 2020 until the middle of May 2020 was used in order to analyse if the traders are influenced by the pandemic media coverage, and notable quotes shifts in BET or any other business sector stocks can be blamed on an "emotional" trading behaviour. Simple, quantile and panel regressions were used in order to better understand the effects of the news-related variables extracted from the RavenPack analytics tool.

Our findings indicated that Coronavirus news impacts the evolution of the stock market, however it's not a strong effect, and it can only be noticed in certain quantiles. The rest of the paper has the following structure: Section 2 presents the data and methodology, Section 3 discusses the results, and Section 4 concludes the paper.

2. Data and Methodology

2.1. Data

Daily BET Index quotes were extracted from the Bucharest Stock Exchange, and the daily return was calculated starting with March 2nd until May 15th. In total, we used 52 observations which are the most relevant as Romania was in general lockdown, and showing the strictest regulations during this period. Also, in order to investigate if some business sectors are being impacted more by the news than others, we established five business sectors and chose two of the stocks that are more liquid for each of them. These were used as panel data (Banking – TLV &BRD, Pharma – BIO & SCD, Oil & Energy – SNP & SNG, IT & Communications – DIGI & LIH, Hotels & Food – EFO & SFG). The quotes were extracted from Thomson Reuters and added in the model as daily returns ($Ri, t = \frac{Pi,t}{Pi,t-1}$ -1).

The Coronavirus news indicators were obtained from RavenPack, which is one of the leading data analytics platforms that monitor big data and provide valuable information for financial professionals, and are specific for Romania. The daily values were extracted from the January 2020, but they became consistent starting with March 1st, so only data from that date forward was used for accuracy and alignment purposes with BET daily quotes. The six COVID-19 news variables are explained in Table 1.

Other independent variables included in the model are the Dow Jones Index (as daily return), the UK Economic Policy Uncertainty Index (being the only

European index with daily frequency), and the Equity Market-related Economic Uncertainty Index (which is one of the US economic uncertainty indices).

All independent news variables were calculated and used as relative values, and the correlation matrix shown a strong link between the MHI and MCI due to the fact that both are calculating the percentage of news that are covering the coronavirus topic in Romania (Table 2).

Table 1

Panic Index (PI)	Measures the levels of news chatter that makes reference to panic or hysteria and Coronavirus. Source: RavenPack https://coronavirus.ravenpack.com/
Media Hype Index (MHI)	Calculates the percentage of news talking about the novel Coronavirus. Source: RavenPack https://coronavirus.ravenpack.com/
Fake News Index (FNI)	Measures the level of media chatter about the novel virus that makes reference to misinformation or fake news alongside COVID-19. Source: RavenPack https://coronavirus.ravenpack.com/
Country Sentiment Index (CSI)	Shows the level of sentiment across all entities mentioned in the news alongside coronavirus. Source: RavenPack https://coronavirus.ravenpack.com/
Infodemic Index (II)	Calculates the percentage of all entities (places, companies, etc.) that are somehow linked to COVID-19. Source: RavenPack https://coronavirus.ravenpack.com/
Media Coverage Index (MCI)	Shows the percentage of all new sources covering the topic of the novel coronavirus. Source: RavenPack https://coronavirus.ravenpack.com/

Table 2

	PI_	MHI_	MCI_	II_	FNI_	CSI_
PI_	1					
MHI_	0.373982	1				
MCI_	0.344244	0.848424	1			
II_	-0.0752	-0.12879	-0.18352	1		
FNI_	0.201967	0.164668	0.162711	0.183668	1	
CSI_	0.160639	-0.02136	-0.10927	-0.25025	-0.003	1

2.2. Methodology

We started the econometric approach with a simple regression to see if, at a general level, the BET Index is being impacted in any way by the pandemic news appearing in Romania. The results can be seen in Table 3.

After the simple regression model, we used quantile regression to examine the effects for different intervals throughout the distribution of BET Index evolution. The quantile regression is much better for analysing these effects as it does not only focus on the mean and makes no assumptions about the distribution of the residuals. This will let us explore different effects of the independent variables on certain percentiles. The estimated coefficients for the chosen quantiles are presented in Table 4.

In the last model, we followed the econometric approach from Cepoi (2020) which used a panel quantile regression framework to investigate the stock market's reaction to coronavirus news in the top six most affected countries by the pandemic. We applied the same logic to the business sector stocks that were chosen, and the coefficients for the selected quantiles are shown in Table 5.

3. Findings

The simple regression including the news and uncertainty indices clearly showed that the Romanian investor doesn't take into consideration the COVID-19 news, and the only variable that is relevant is the Dow Jones Index. It can be concluded that the Romanian press cannot cause a great deal of impact on the Stock Market with regard to Coronavirus, nor can we say that DJI is impacted either by this sort of news as a recent study (Arshian Sharif et. al. 2020) found that US investors may react differently in terms of their investment decisions for example, "bad" news about the US climbing infected cases, deaths, governmental distancing guidelines as well as oil price movement shocks may be perceived differently by market traders. Bad news may induce short-term traders to sell, while long-run traders may perceive the same news as a buying opportunity with the perception that such news would lead to higher long term gains.

Table 3

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.14461	0.290542	-0.497721	0.6213
DJI_	0.494456	0.064384	7.679833	0
MHI_	-0.02064	0.02146	-0.961945	0.3416
FNI_	-0.00077	0.00054	-1.420549	0.1628
CSI_	-5.53E-05	0.001264	-0.043794	0.9653
II_	-0.00016	0.009711	-0.016304	0.9871
MCI_	0.012114	0.031937	0.379315	0.7064
EMEUI_	0.007406	0.006363	1.163813	0.2511
UKEPU_	-0.01541	0.013273	-1.160754	0.2523
R-squared	0.612266	Mean dependent var		-0.2245
Adjusted R-squared	0.538412	S.D. dependent var		2.922121
S.E. of regression	1.985297	Akaike info criterion		4.368199
Sum squared resid	165.539	Schwarz criterion		4.70911
Log likelihood	-102.389	Hannan-Quinn criter.		4.498471
F-statistic	8.290208	Durbin-Watson stat		2.141974
Prob(F-statistic)	0.000001			

The quantile regression allowed us to check for possible impact of the news indices at different intervals through the distribution of BET returns, resulting the below coefficients. The result was interesting as in higher quantiles fake news show a negative impact towards BET returns; however, it is in a decreasing manner as we advance towards higher volatility. Apart from the DJI, that is relevant across the entire distribution of returns, no other variables were found to be relevant.

Table 4

	Q10th	Q25th	Q60th	Q75th	Q90th
DJI_	0.615714***	0.437982***	0.527003***	0.450618***	0.597405***
PI	-0.008305	-0.001534	0.000754	-0.000325	-0.002452
MHI_	-0.007013	-0.020676	0.002417	-0.003891	0.001989
FNI_	0.000266	-0.00042	-0.001045***	-0.00108***	-0.001427***
CSI_	0.002125	-0.001271	-0.000399	-0.000282	0.001548
II_	0.004435	0.003923	0.00012	-0.006059	0.013894
EMEUI_	0.005306	0.008531	0.007387	0.009979	0.016497
UKEPU_	-0.041344	-0.000919	-0.009881	-0.00667	-0.001393

Table 5 shows the coefficients of the panel quantile regressions for each business sector.

The Panic Index is showing increasing relevance towards the high quantiles of the IT & C sector with an increasing coefficient as well. The lack of relevance towards the other sectors is a good thing, meaning that investors are not reacting to coronavirus hysteria related news. The Fake News Index has a general negative effect on all sectors, however this effect is very weak and it is not present in the low quantile. The IT & C sector again seems to react to fake news starting with the 60th quantile onwards. The effect is weak, but it exists. The Country Sentiment Index shows an effect only in the 10th quantile with a negative coefficient in the banking sector and a positive coefficient in the hotels & food industry, however, again the impact is very weak. In the higher quantiles, the Infodemic Index is proving to be relevant as the market is reacting to news about companies and places being affected by the coronavirus.

Table 5

	PI_	MHI_	FNI_	CSI_	II_	MCI_
Q10th						
Banking	0.00482	-0.04705	-0.00012	**-0.00455**	-0.01190	-0.02633
Pharma	0.00360	-0.06702	-0.00108	-0.00064	-0.00501	0.03812
O&E	-0.00521	0.05404	-0.00043	-0.0025 9	0.02691	-0.03179
IT&C	-0.00322	-0.01936	0.00062	-0.00212	0.00615	0.01491
H&F	0.00075	0.04857	-0.00047	**0.00419**	**0.02763**	-0.02107
Q25th						
Banking	0.00356	0.06221	**-0.00147**	-0.00171	0.00791	-0.06484
Pharma	0.00201	0.01976	0.00006	-0.00175	-0.00243	-0.04624
O&E	-0.00246	0.00322	-0.00115	-0.00119	0.00534	0.00022
IT&C	0.00004	-0.04277	-0.00003	-0.00127	-0.00993	0.04260
H&F	0.00160	0.00472	**-0.00107**	0.00053	0.01834	0.03386
Q60th						
Banking	-0.00185	-0.00372	-0.00118	0.00066	0.00996	0.01887
Pharma	0.00086	-0.00850	-0.00002	-0.00151	-0.01385	-0.01020
O&E	-0.00040	0.00289	-0.00054	0.00055	0.00307	-0.00938
IT&C	0.00293	-0.04025	-0.00074	0.00090	0.01261	0.04202
H&F	0.00177	0.01945	-0.00072	-0.00075	-0.00373	-0.02115

	PI_	MHI_	FNI_	CSI_	II_	MCI_
Q75th						
Banking	0.00424	0.01359	-0.00132	-0.00008	-0.00246	-0.06074
Pharma	0.00246	-0.02227	-0.00042	-0.00051	-0.00193	0.00071
O&E	0.00020	0.00816	-0.00065	0.00041	-0.00595	-0.03537
IT&C	0.01390	-0.03047	**-0.00129**	0.00084	0.01868	-0.00299
H&F	-0.00143	-0.00317	-0.00081	0.00039	-0.01351	-0.03705
Q90th						
Banking	0.00709	0.00626	0.00081	-0.00105	-0.02370	-0.07712
Pharma	0.00723	-0.05104	-0.00025	0.00035	-0.00502	0.03480
O&E	0.00117	0.04428	-0.00093	0.00119	-0.00249	**-0.08555**
IT&C	**0.02004**	-0.04271	**-0.00181**	0.00155	**0.02206**	-0.00463
H&F	-0.00574	0.02694	0.00052	0.00126	-0.03214	-0.06408

4. Conclusions

This paper shows to what extent the COVID-19 news are impacting the daily returns on the Romanian Stock Market. Effects are present in certain quantiles, yet they are very weak. Fake news is proving to impact returns in a negative way as investors are responding to all uncertainty the virus shows.

Due to the sample size, we advise that our findings should be taken with caution, and we encourage further researches using a larger data sample to study the long-term effects of the pandemic on the financial market by also taking into consideration monetary policy and other macroeconomic factors.

References

[1] Badar, N. A. (2020). Stock markets' reaction to COVID-19: Cases or fatalities? *Elsevier Research in International Business and Finance*.

[2] Broadstock, D. C., Zhang, D. (2019). Social-media and intraday stock returns: The pricing power of sentiment. *Elsevier Finance Research Letters*.

[3] Cepoi, C.-O. (2020). Asymmetric dependence between stock market returns and news during COVID-19 financial turmoil. *Elsevier Finance Research Letters*.

[4] Sharif, A., Aloui, C., Yarovaya, L. (2020). COVID-19 pandemic, oil prices, stock market, geopolitical risk and policy uncertainty nexus in the US economy: Fresh evidence from the wavelet based approach. *Elsevier International Review of Financial Analysis*.

[5] Wagner, A. F. (2020). What the stock market tells us about the post-COVID-19 world. *Nature Human Behaviour Journal*.

[6] Zaremba, A., Kizys, R., Aharon, D. Y., Demir, E. (2020). Infected Markets: Novel Coronavirus, Government Interventions, and Stock Return Volatility around the Globe. *Elsevier Finance Research Letters*.

[7] Zhang, D., Hu, M., Ji, Q. (2020). Financial markets under the global pandemic of COVID-19. *Elsevier Finance Research Letters*.

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Evaluating the Performance of the Enterprise in the Telecommunications Sector and the Impact of R&D on Profitability

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Abstract

In this paper, we have pursued the measurement of the financial performance in the telecommunications sector, namely a direct approach towards Digi Telecommunications Group.

This paperwork examines empirically three groups of indicators: the rates of return on invested capitals, the liquidity and the indicators of profitability. Due to the high degree of validity in its capacity to analyse and measure various aspects of the financial health of a company, the analysis of the financial report was realised using the data provided by the Bucharest Stock Exchange through its annual reports and the Thomson Reuters Eikon platform. The rates of return on capitals are relevant indicators, much appreciated by the investors interested in analysing the financial performance of large companies. The relevant reports which reflect various aspects of the financial health of the company were analysed and compiled in order to arrive to a conclusion with respect to the financial situation of Digi Telecommunications Group. The results indicate a high level of return in 2017 compared with years 2018 and 2019, most likely indicating the strengthening of the company's capacity to control the costs while pursuing stronger profit margins. The liquidity slightly decreased for the four years under study. The analysis of the rates of return on capitals, of liquidity and profitability ratios clearly show a stable and broadly positive trend for the years 2016 to 2019, highlighting an improvement in the company's resource management and a positive outlook for the company and good news for the investors.

A long term improvement of the company's profit results is prompted by R&D projects, which constantly contribute to its sustainable development. The R&D programmes are not only key and basic components to development of science and technology; they also play an important role in developing and sustaining the growth of the national economy and corporate business. The R&D process is associated with investment, process which can be the one of the most critical determinants in boosting scientific and technological progress.

Keywords: financial performance, rates of return on capitals, R&D programmes, indicators of profitability.

JEL Classification: G20, G32

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1. Introduction

Changes and evolutions on the financial market should also be reflected in the financial management of enterprises, the adaptation of services and products to the requirements and needs of the market, regardless of the business segment.

The importance of the telecommunications system has been demonstrated, lately more than ever, by the need to ensure safe and high-quality services.

What we have pursued through this study is the determination of the most important financial indicators and the creation of a clear image for investors on the profitability of the Digi Telecommunication Group, company listed on the Bucharest Stock Exchange.

Digi Communications Group is a leading European operator in the field of electronic communications, with operations in Romania, Hungary, Spain and Italy. Depending on the number of fixed internet connections registered at the end of 2019, in Romania, Digi had a market share of 53%, Telekom Group 21%, the other providers totalling 26%[3].

Continuous development in the telecommunications sector is related to R&D investments in new technologies and the improvement of services and the growth of the market segment.

The aim of this study is to highlight the results of key financial indicators, such as return on assets (ROA) and return on equity (ROE), liquidity and to reflect on the other indicators of financial profitability.

ROA - return on assets measures the efficiency of the capital allocated in the fixed assets and in the current assets of the enterprise. It does not consider the way capital is procured (own or borrowed) and is independent of the financing policy. For a better return on capital, it is important that this indicator is as high as possible. A financial manager must have other comparable market data to track the level of business efficiency, such as the inflation rate, the average rate of return on the business sector, the interest rate on deposits.

ROE - return on equity represents the efficiency of the use of the own capitals, it emphasizes the capacity of the enterprise to earn profit by using the own capitals at its disposal. The indicator shows the rate of return on capital invested by shareholders and/or associates. As with the return on assets, the manager or financial manager must consider the inflation rate, the average rate of return on the sector of activity, and the rate of interest on deposits.

Liquidity is a factor which has a very important role in the evaluation of financial performance (Bărbuță-Mișu, Madaleno, 2019)[2]. More than that, this hypothesis may be interpreted as the degree to which an asset can be at a time converted into cash, but here depending on the asset demand and supply. In this situation, we can say that liquidity risk is also one of the important causes of a financial crisis and we must consider it as an important factor in determining financial performance.

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2. Problem Statement

The issue of knowing and measuring the financial performance of the enterprise is an essential element in assessing and improving economic efficiency. The evolution of the economic environment in recent decades has significantly changed the way we approach performance at the enterprise level, so that many theories in the field have been adapted to the new economic reality, and, in some cases, complemented by new complementary theories.

Many researchers (Bhargava, 2017) [4] analysed the financial statements of two information technology companies in India, WIPRO Ltd and INFOSYS Ltd, for five years, 2011-2012 and 2015-2016. Bhargava used several financial ratios to make a comparison between the two companies in relation to profitability and capital structure. The result of his analysis showed a significant difference of the ratios used between the two companies.

Another study (Bansal, 2015) [1] assured the finance and accounting performance of leading IT Indian companies for the period 2010-2014. Bansal analysed the financial statements of four IT companies, namely TATA CONSULTING SERVICES, WIPRO Ltd, INFOSYS Ltd, and TECH MAHINDRA Ltd. The analysis was conducted for five years, to compare the measurements of liquidity, profitability, market performance, solvency, and leverage levels. He concluded that Infosys Ltd is the most sought-after company for investors. Along similar lines is Tata Consulting Services, whose working capital turnover, total asset turnover and DuPont analysis returns show encouraging signs for shareholders who have profits as their point of consideration.

A study on Indian Telecom Companies (Pandey et al., 2013) [9] analysed the financial statements of the four telecom companies in India, BSNL, RELLANCE, AIRTEL, and MTNL. Four financial ratios have been analysed and used, current ratio, fixed assets to total turnover, debt to equity ratio and return on equity ratio to assess if there is a difference in this group of companies. The authors used ANOVA analysis to test the data for five years, from 2008 to 2012. The results of their analysis reveal a significant difference of the above ratios between the companies under study.

Other studies (Santos and Brito, 2012) [11] and (Selvam et al., 2016) [12] agreed to represent that firm performance was a subset of the dimension consisting of the unidimensional or multi-dimensional indicator. The domain includes from the overall financial indicator (profitability, market value, and growth) to the social indicator (employee and customer satisfaction, environmental and environmental audit performance, corporate governance performance, and social performance). Some studies (Karabag and Berggren, 2014) [7] researched how the impact of firm strategy and also industry structure as well as business group membership and state support can influence firm performance in Turkey; in this research, they use a data set compiled from the largest manufacturing firms. The conclusions of the study highlighted that industry structure and business group membership were the strongest determinants of firm performance. Other study (Saleem and Rehman, 2011)[10], applied a linear regression model to determine the correlation between

the liquidity and profitability indicator, and the empirical results of the study confirmed that there exist an important control of liquid ratio on ROA whereas there is an insignificant effect on ROE indicator**.** In his study, (Bărbuță-Mișu et al., 2019)[3] analyse what are the possible factors able to influence the financial performance level, in firms of the European Union, given the crisis period effect. They presented the risk factors capable to affect asset values and firms' financial performance, but in the paper, they have been highlighting the following factors: borrowed capital repayment and labour productivity, leverage, solvency, asset turnover, liquidity as representing indicators that are affected by a potential financial crisis.

Also, various studies show either poor or no statistical relation between capital structure and performance firm (Ebaid, 2009)[5]. Ebaid investigates the impact of capital structure choice on the performance of 64 firms in the Egyptian capital market. He uses the following accounting measures: ROA, ROE, gross profit margin, and concludes that capital structure choices, generally, have a weak-to-no impact on firm return.

Researcher (Al-Taani, 2013) [8] used the data of 45 manufacturing companies which are listed on the Amman Stock Exchange. Multiple regression analysis was applied on performance indicators such as: ROA and Profit Margin as well as Short-term debt to Total assets, Total debt to Equity and Long-term debt to Total assets, as capital structure variables. The results show that there is a negative and insignificant relationship between short-term debt to total assets and long-term debt to total asset, also ROA and PM. The results of the study show that statistically, capital structure of the firms is not a major determinant of their performance. The conclusion highlights that managers of manufacturing firms should exercise caution while choosing the amount of debt to use in their capital structure as it affects their performance negatively.

3. Research Questions / Aims of the Research

In support of investment decisions, the financial information provided by the company is vital. Thus, the financial health is followed by both the company's managers and shareholders (Ibrahim, 2019) [6].

In respect of current shareholders, it can provide important and revealing insight regarding the following questions: should they buy more common or preferred stocks or should they sell some of their currently owned shares? Financial results help in responding to these questions by assessing the calculated risk and anticipated return from acquiring shares in the two distinct stock options, regardless of whether they are common or preferred. This information is also useful for potential investors as it helps guide them towards buying stocks that best fit the levels of risk and return that they are most comfortable with. The financial results help the managers in comparing the financial situation of the company with that of their competitors on the market. At the same time, the suppliers and lenders also rely on the financial accounting information. Suppliers need to make an accurate judgment regarding the ability of their clients in order to negotiate better

contractual terms and conditions in relation to credit and payment for their goods and services. In turn, lenders require financial information from their clients to help them assess the financial position of the company that they are lending capital to. Furthermore, researchers and financial analysts are interested in consulting the financial accounting data in order to identify both the current developments and the trends in the performance of the corporation or the industry. For example, one can easily visualize the profit growth movement by conducting a type of analysis known as time-series analysis. Additionally, the analysts find the financial accounting information very valuable as it allows them to investigate structural and performance commonalities between industry competitors and to perform cross sectional analysis between two or more industry players.

4. Research Methods

The sources of the data and financial information were obtained from the financial reports of Digi Telecommunications Group, as well as from the platform Thomson Reuters. The data collected through these sources was analysed and used in determining financial indicators, such as indicators of profitability, liquidity and capital structure. The indicators were calculated over a period of four years, 2016-2019.

Table 1. Variable description

Description	Abbreviation	Calculation
Profitability		
Gross Margin	Gross Margin	Gross Profit/Revenue*100
EBITDA Margin	EBITDA Margin	EBITDA/Total Revenue*100
Operating Margin	Op.Margin	Operating profit/Total Revenue*100
Pretax Margin	Pretax Margin	Pretax Income/Revenue*100
Effective Tax Rate	Effective Tax Rate	Income Tax/Pretax Income*100
Net Margin	Net Margin	Income After Tax/Total Revenue*100
Return on Equity	ROE	Net income /Average total Equity*100
Return on Assets	ROA	Income After Tax/Avr. Total Assets*100
Return on invested capital	ROIC	Income After Tax/Avg LT Capital
Liquidity		
Quick Ratio	Quick Ratio	Current Assets*Inventory/Current Liabilities
Current Ratio	Current Ratio	Current Assets/Current Liabilities
Times Interest Earned	TIE	EBIT/Interest Expense
Cash Cycle (Days)	Cash Cycle (Days)	Average Inventory - Abg A/P Days/Avg. A/P Days

Source: Authors' development based on data from Thomson Reuters platform

5. Findings

The determination of the main financial indicators of Digi Telecommunications Group will be presented below. The results indicate a high level of return (ROE and ROA) in 2017 compared to years 2018 and 2019. The return on invested capital (ROIC) represents the performance of the exploitation of the entire economic asset of the company, reporting the total profit obtained to the entire economic asset. This indicator related to the inflation rate is higher, which allows the company to recover its investments.

Table 2. Profitability indicators

Profitability	**2016**	**2017**	**2018**	**2019**
Gross Margin	93.1%	96.2%	95.9%	97.1%
EBITDA Margin	29.7%	31.3%	30.3%	37.4%
Operating Margin	9.4%	12.6%	9.9%	12.2%
Pretax Margin	2.7%	8.7%	3.8%	5.2%
Effective Tax Rate	49.0%	21.9%	52.2%	33.6%
Net Margin	1.4%	6.8%	1.8%	3.4%
ROE	-	65.6%	12.5%	24.6%
ROA	-	4.81%	1.28%	2.28%
ROIC	-	7.5%	2.1%	3.7%

Source: Authors' development based on data from Thomson Reuters platform

In Table 2, we presented the results of profitability indicators from 2016 to 2019, thus highlighting their evolution over time. According to the first result, it is obvious that the company had a high profitability in 2017, the Return on Equity (ROE) was 65.6% compared to 2018 when it registered 12.5%, and a slight increase in 2019 where it registered 24.6%. The same evolutions are represented by the Return on Assets (ROA), more precisely 4.81% in 2017, the highest value recorded in the years studied followed by a decline in 2018, 1.28% and an increase in 2019 where ROA was 2.28%. A favourable result was also recorded and ROIC in 2017, 7.5%.

Through ROA, we have ensured the efficiency of the capitals allocated in the fixed assets and current assets of the company, but this does not consider the way of procuring the own capitals (own or borrowed) and is independent of the financing policy. On the other hand, ROE is represented by high values; it validates the capacity of the enterprise to make a profit by using its own capital, because the results presented are well above the current inflation rate or the interest rate on deposit.

Table 3. Liquidity indicators

Liquidity	**2016**	**2017**	**2018**	**2019**
Quick Ratio	0.40	0.36	0.28	0.29
Current Ratio	0.44	0.38	0.31	0.31
Times Interest Earned	1.8	3.2	2.2	2.4
Cash Cycle (Days)	-	(3,662.6)	(3,400.0)	(4,698.9)

Source: Authors' development based on data from Thomson Reuters platform

Table 3 shows the analysis of liquidity indicators, quick ratio, current ratio, times interest earned and cash cycle. The current ratio measures a company's ability to pay current or short-term liabilities with its current or short-term assets. In the four years studied, the result of the indicator was below 1, the highest value being 0.44 in 2016. In this situation, creditors would consider the company a financial risk because it might not be able to easily pay down its short-term obligations. The quick ratio also measures the liquidity of a company by measuring how well its current assets could cover its current liabilities. However, the quick ratio is a more conservative measure of liquidity because it doesn't include all the items used in the current ratio. Similar to the current ratio, this indicator is below 1, which could create difficulties in the company's ability to pay its debts in the short-term.

6. Conclusions

The goal of this paper was to measure the financial performance of Digi Telecommunications Group. The research was focused on analysing the performance indicators: the rates of return on capitals, the liquidity and the indicators of profitability. The results showed a high performance of the company in the studied period, especially in 2017 when ROE was 65.6%, ROA 4.81% and ROIC 7.5%.

On the other hand, the liquidity indicators registered a low coefficient, which can create difficulties in case of short-term payments, and this may reduce confidence to partners or suppliers.

Liquidity risk is also considered one of the major causes of financial crises of the company and should thus be considered by economists as an important factor in financial performance and profitability. A high liquidity shows the financial force of the firm and in the literature we found a significant positive relationship between liquidity variables (quick ratio, current ratio) and the profitability of the firm.

Based on the results and information presented, the study can continue at a larger scale, at the level of the entire sector and in making a comparison at the level of EU companies.

References

[1] Bansal, R. (2015). A Comparative Analysis of the Financial Performance of Selected Indian IT Companies during 2010-2014, *The IUP Journal of Accounting Research and Audit Practice*, XIV(4), pp. 43-60.

[2] Bărbuță-Mișu, N., Madaleno, M. (2019). The financial Performance of European Companies: Explanatory Factors in the context of Economic Crisis, *Journal Ekonomika*, 98(2), pp. 6-18.

[3] Bărbuță-Mișu, N., Madaleno, M., Ilie, V. (2019). Analysis of Risk Factors Affecting Firms' Financial Performance − Support for Managerial Decision-Making, *Sustenability*, 11(18), pp. 1-19.

[4] Bhargava, P. (2017). Financial Analysis of Information and Technology Industry of India: A case Study of WIPRO Ltd and INFOSYS Ltd, *Journal of Accounting, Finance and Auditing Studies*, pp.1-13.

[5] Ebaid, I. E. (2009). The impact of capital structure choice on firm performance: empirical evidence from Egypt, *Journal of risk Finance*, 7, pp. 477-487.

[6] Ibrahim, M. (2019). Measuring the Financial Performance of a Telecommunications Corporation, *International Journal of Recent Technology and Engineering*, 8(4), pp. 4992-4994.

[7] Karabag. S. F., Berggren. C. (2014). Antecedents of firm performance in emerging economies: Business groups, strategy, industry structure, and state support, *Jurnal of Business Research*, 67(10), pp. 2212-2223.

[8] Khalaf Al-Taani (2013). The Relationship between Capital Structure and Firm Performance: Evidence from Jordan. *Global Advanced Research Journal of Management and Business Studies*, 2(11), pp. 542-546.

[9] Pandey, S., Verma, V., and Vikas, J. (2013). Measuring Financial Soundness of Indian Telecom Companies: A Comparative Analysis, *The International Journal of Management*, 2(2), pp. 1-13.

[10] Saleem, Q., Rehman, R. U. (2011). Impact of Liquidity Ratios on Profitability. *Interdiscip. J. Res. Bus.*, 1, pp. 95-98.

[11] Santos, J. B., and Brito, L.A.L. (2012). Toward a Subjective Measurement Model for Firm Performance. *Brazillian Administration Review*, 9(6), pp. 95-117.

[12] Selvam, M., Gayathri, J., Vasanth, V., Lingaraja, K., and Marxiaoli, S. (2016). Determinants of Firm Performance: A Subjective Model. *International Journal of Social Science Studies*, 4(7), pp. 90-100.

[13] Site web: www.ancom.ro.

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Analysis of Granger Causality between Migration and Gross Domestic Product in Romania

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Abstract

In this paper, we aim at evaluating any relationship of causality between migration indicators (both emigration and immigration) and GDP for Romania, including an analysis considering the countries of destination and origin. On the basis of official statistical data, we hope to reach a valid conclusion as to whether the migration phenomenon poses a definitive influence on the GDP. The type of causality studied is the Granger one, by pursuing the Toda-Yamamoto methodology, as the GDP, considered for the purposes of this paper as GDP per capita, is highly expected to be non-stationary. The assessment of causality will aim the two directions, by pairs of indicators, emigration-GDP, immigration-GDP and net migration-GDP.

Keywords: migration, immigration, GDP, causality, model.

JEL Classification: F22, O40

1. Introduction

As the world evolves, so is the phenomenon of migration. Migration has been around for centuries, and since the free circulation of human capital among European countries, this phenomenon is becoming more and more present in the European Union and not only. As Blouchoutzi & Nikas (2014) state, large-scale emigration can be noticed after the collapse of the socialist system and of the economies of some Eastern European countries.

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Well-known information about migration is that it has an economic impact on both parties involved: on the economic development of the country from which the human capital is leaving, and also on the economic growth of the country that receives the new flux of people. But the information and results regarding the nature and the dimension of this impact differ from one study to another. This lack of uniform results makes migration a debated topic of discussion in the economic literature. In this study, we analyse both emigration and immigration and their impact on the economic growth of a country.

2. Problem Statement

Emigrants, peoplewho leave their native country, are considered to have an impact on the economic development of the country they leave behind. But what kind of impact? Some studies consider this impact to be a negative one. This particular hypostasis has a logical argumentation. Since human capital is leaving, so is its contribution to the economy. ItIt does not pay taxes and itit does not put any money back in the economy. Atoyan et al. (2016) mention the fact that the emigration of skilled and qualified persons can reduce the labour force and productivity, having a negative impact on the economic growth of the country of emigration. Kindleberger (1965) sees output reduction and human capital export as main losses determined by emigration. Madhavan (1985) also talks about a "skill drain" as a cost in the long run that can reduce development, if emigrants are professionally trained and highly educated. Kindleberger (1965) calls this a dynamic loss, where young, productive and skilled persons leave the country.

So, in theory, emigrants influence in a negative way particularly the economic development, the Gross Domestic Product (GDP) of the country they leave behind. But is this really true? Other studies argue that emigrants do contribute to the economic growth through remittances, the sum of money they send back home, to their family, money that re-enter the economic circuit of the country from which they left. A study on the causality between remittances and GDP has been presented by Păunică et.al. (2019). Kindleberger (1965) presents remittances and forgone consumption as main benefits of emigration. Remittances are considered by Blouchoutzi & Nikas (2014) as a compensation for the countries of emigration, for loss of their human capital. Their study reveals that remittances contribute to the formation of the gross fixed capital, but the impact on economic growth depends on the way remittances are used by the country that receives them. Madhavan (1985) also identifies remittances as a factor that improves the balance of payment, while Rapoport & Docquier (2006) consider that the economic performance of a country is positively influenced by emigration and remittances in the long run. But is the gain obtained through remittances at least equal, if not greater, than the cost of the lost human capital? Can emigration be a positive thing for a country and its economy?

In return, immigrants, people that enter another country, other than their native place, may also have an influence on the economic development of the country they enter. But the question remains the same. What kind of impact? According

to the international literature, immigration tends to have a favourable impact on the economic development of the country that receives the new human capital (Bove & Elia, 2017). Morley's (2006) study can also offer evidence for a long run causality relation from economic growth per capita to immigration. Muller (1989) also considers that immigrants contribute to economic growth. Păunică etal. (2018) have analysed some facets of globalization, by outlining the behaviour of globalization indicators.

Immigrants' influence can be a positive one, based on a logical argument: they contribute to the economy by paying taxes and inserting money back into the economy in which they live. Neal & Uselding (1972) consider that immigration contributes to capital stock through social savings. Chiswick et al. (1992) consider that an increase in the immigration rate may have a favourable impact on the capital formation and also on the native population's income. The OECD study brings to our attention that migrants' contributions in taxes exceed the benefits they receive and also that migration boosts the percentage of the population that is of working age, stating that if migration expands the workforce, the GDP at an aggregate level is expected to grow (http://www.oecd.org/migration/OECD%20 Migration% 20Policy%20Debates%20Numero%202.pdf). Boubtane et al. (2013) demonstrate that immigration has positive influence on the GDP per capita and a negative influence on aggregate unemployment, but in turn it is influenced by the economic condition of the country to which people migrate. They also state that the positive influence of immigration on economic growth can be enhanced by the immigrants' level of education.

We should also take into consideration, while talking about the beneficial influence of immigration, that immigrants can bring with them new knowledge, know-how and other valuable information that can be beneficial to a country's development. Bove & Elia (2017) support the premises that migrants bring with them, in the advantage of the country they move to, new perspective and skills that can contribute to economic development or even technological innovation. The OECD study also brings to our attention that migrants possess certain skills and abilities, contributing to technological progress, research and innovation and human capital development, and contrary to our expectation, are not a burden for the economy (http://www.oecd.org/migration/OECD%20Migration% 20Policy%20 Debates%20Numero %202.pdf). Boubtane et al. (2016) considers that immigrants can contribute to innovation and technological progress through their skills, and confirm a small positive influence of migration on the GDP per capita.

But can immigration also have a negative influence? The country receiving immigrants also has to pay the cost of their assimilation and introduction to the economy. If immigrants are not productive in return, the cost can exceed the benefits they bring to the economy. Borjas (1995) considers that fiscal costs are superior for unskilled immigrants, due to the fact that they are more likely to pay fewer taxes and also use government services. We can also bring into discussion here the communication, cultural and other social barriers to an efficient integration of immigrants into employment, which can make their contribution less beneficial

to the economy. Bove & Elia (2017) mention that, economic growth can be negatively influenced by the diversity immigrants bring, by the barrier of communication and coordination. Nevertheless, the result suggests that the diversity brought by immigration is in general favourable for economic growth.

We should also mention that, in the case of immigration, we face another problem, which is also intensively debated in the literature. By employment, immigrants and natives will tend to apply for the same position at the same company. Is the demand in the labour market great enough to support the integration of everyone? Or may the country also face unemployment? Immigrants can compete with native-born persons on the labour market and also can determine a decrease in the wages offered by the employer, but evidence to support this hypothesis is scarce (Friedberg & Hunt, 1995). Boubtane et al. (2013) consider that immigration does not have a negative impact on employment opportunities.

All these uncertainties can hinder the economic development of the country that receives immigrants. So, the question remains the same. Is the gain obtained by accepting immigrants at least equal, if not higher, than the costs? Can immigration be a positive thing for a country and its economy?

If we look closely at the international studies, the answer to our questions becomes obvious: it depends! It may not be the answer we look for, it may not be clear, but it might be true. It depends. It depends on numerous factors, such as the level of education of the person that leaves or enters a country, its age, health and so on. As Madhavan (1985) said, the influence that emigration has on economic development is affected by a series of elements such as population growth, number of emigrants and their characteristics, the volume of remittances, and so on. Borjas (2019) also considers that the relation between immigration and growth is influenced by the size of the immigration phenomenon, the skills, knowledge and ability of the immigrants and the degree of assimilation, stating that immigration is more beneficial in terms of economic grow if immigrants are high-skilled workers that pay taxes and are not a burden. For Hanson (2012), innovation is also supported by high-skilled immigrants who also pay more taxes and contribute to productivity growth.

In order to better understand the impact of migration (in term of emigration and immigration) on the GDP, in the following sections we analysed the particular case of Romania.

3. Research Questions / Aims of the Research

The question this study addresses is the existence of a Granger causality relationship between three indicators of migration (immigration, emigration and net migration) and the economic growth, measured by the Gross Domestic Product per capita, in Romania.

Subsequent to this question, we have defined the following research hypotheses:

- H1. Emigration causes the Gross Domestic Product per capita.
- H2. Immigration causes the Gross Domestic Product per capita.
- H3. Immigration net migration causes the Gross Domestic Product per capita.

4. Research Methods

The research method applied for this study was the Toda-Yamamoto method for Granger Causality, and is based on the algorithm presented by Giles (2011). The suitability of this method for the study derives from two reasons:

- the size of the sample;
- the probability (not known before) to deal with non-stationary variables, moreover they could be integrated as different order variables, which also prevents the application of the regression between the first differences.

All data were extracted from the Romanian National Institute of Statistics Tempo online database. The dataset involves four components:

- emigration (dataset "*Permanent emigrants by country of destination*", code *POP309D*, metadata available in the Tempo database, see NSI, 2020a). The data selected include total values and values by countries, and the measurement unit is the number of persons.
- immigration (dataset "*Permanent immigrants by country of origin*", code *POP310D*, metadata available on Tempo database, see NSI, 2020b). The data parameters are the same as those used for the previous indicator.
- Gross Domestic Product per capita, dataset "*CON107B - The main aggregates per inhabitant - ESA 2010*", indicator *"Gross Domestic Product"*, expressed in "*Current prices, lei*". Metadata are available on Tempo database, see NSI, 2020c).

Our dataset covers the interval between 1995 and 2018, the geographical dimension refers to Romania, highlighting, within the dataset, the countries of origin (for immigration). The analysis of immigration refers to the analysis of the total number of migrants and the analysis of the number of migrants by continents: America, Europe and other countries.

Given the fact that we applied Eviews® to analyse our data, the methodology was implemented with the following characteristics (derived from the structure of our dataset):

Unit root tests. The tests applied were the Augmented Dickey-Fuller (ADF, for a maximum of 5 lags, automatic lag selection based on the *Schwarz Info Criterion*) and the Phillips-Perron (PP, with *default Bartlett kernel spectral estimation method* and *automatic selection* based on *Newey-West bandwidth*). Given the evolution of the datasets, the tests were applied for the *Trend and intercept* option.

Estimation of VAR models. For each pair of variables, a VAR model was designed, with an initial lag established on the basis of the optimum criteria, for a maximum of four lags (the value was chosen as indicated by the majority of the criteria, when no majority existed, the SIC criterion was given preference).

Test of the VAR models, namely the four tests:

AR roots test;

Autocorrelation LM test;

Normality test: Cholesky of covariance (Lutkepohl);

White heteroskedasticity test (No Cross Terms).

Giles (2011) indicates that, in case of unsatisfactory stability (AR roots) or autocorrelation, the maximum lag length should be increased by one unit, until these issues are solved. But Hacker and Hatemi-J (2003) indicate that misleading results can be obtained through Toda-Yamamoto method, if the normality and ARCH tests display unsatisfactory results.

Therefore, we have applied Giles's (2011) instructions for stability and autocorrelation problems, but, if a model failed the normality and heteroskedasticity tests, it has not been considered for the application of the following stages.

After this step, the models were set to a maximum lag length that reflects the maximum possible compliance with the tests, under the rules defined in the above paragraphs.

Application of the modified Wald test for the suitable models, following the procedure described by Giles (2011).

Subsequent to the tests applied for original data, we have attempted to analyse the causality between the logarithms of initial values, and thus discover any causality between the elasticity of the migration indicators and the elasticity of the GDPC.

5. Findings

5.1. Emigration and Gross Domestic Product per capita

The first step was to test the unit roots for the two data series, and the results are presented in table 1.

Table 1. Degrees of integration

Test	Emigration	GDPC
ADF	1	2
PP	1	2

Source: Authors' representation, based on the application of ADF and PP tests

Both tests indicate the same order of integration, and the maximum order, to be applied in the final step of the analysis is therefore 2.

The maximum lag length for the estimated VAR model (named var_em) has been established by interpreting the information criteria.

After applying the specification tests on the VAR(1) model, the results of the stability (AR roots) test cannot be accepted, even after defining a VAR(7), while VAR(8) is impossible to be configured, as there are not enough data available. Therefore, we cannot proceed further with the desired test of Granger causality.

The analysis of logarithm data began, as well, with the order of integration for the target variables. All variables were found to be I(1). A VAR model was then estimated, at an optimum lag length of 1…1. The next step (the reliability tests) indicates a stable model, but there are signs of non-normality and heteroskedasticity, therefore the model cannot be used in future analyses.

5.2. Immigration and Gross Domestic Product per capita

The unit root tests for the two variables outlined the following results:

Table 2. Degrees of integration

Test	Immigration	GDPC
ADF	2	2
PP	1	2

Source: Authors' representation, based on the application of ADF and PP tests

Even if different orders of integration are obtained after interpreting the parameters of the two tests, there is no influence on the final step of the methodology, as GDPC is I(2).

The VAR(IM GDPC) was then estimated, with an optimum lag length of 1…1, as indicated by all information criteria applied on the model. Following this adjustment, the model was then subjected to specification tests, but, the stability issues persisted, as in the case of immigration, up to maximum lag length 7 (at least one root above 1 has been found in each one of the seven models estimated).

When analysing the logarithm data, we start from a maximum order of integration that is 1, and a VAR(1) after assessing the results of information criteria tests.

The model is not stable and cannot be brought to a stable state, even if it is transformed to VAR(7).

5.3. Net migration and Gross Domestic Product per capita

The unit root tests led to the following orders of integration for the two variables:

Table 3. Degrees of integration

Test	Net migration	GDPC
ADF	2	2
PP	1	2

Source: Authors' representation, based on the application of ADF and PP tests

Because GDPC is I(2), this is the maximum order of integration that can be applied in the final step. We have estimated the initial VAR as VAR(1), as indicated by all information criteria. However, during the stability test, unit roots above 1 prevent the use of the model for further testing.

As in Romania, the net migration has some negative values, it is not possible to extract logarithms from the data.

5.4. Immigration from Europe and Gross Domestic Product per capita

The data regarding the immigration from Europe was computed by the authors, by aggregating the data for the European countries of origin.

The order of integration has been evaluated to 2 for all variables, and confirmed by both tests applied.

The initial VAR(3) model was unstable, so the lag length was gradually extended to the maximum allowed (7). However, none of the AR root tests succeeded.

5.5. Immigration from America and Gross Domestic Product per capita

Both ADF and PP test verified that the immigration variable is I(1), while GDP is I(2).

Having designed the VAR model between the variables, the optimum lag length was 4. But, as in the previous case, the model presents roots above 1 and we cannot move further (the maximum lag length was increased to 7).

6. Conclusions

Despite our initial hopes, no model was suitable for analysis, as we chose to follow the conservative approach to VAR testing, described in the research methodology. The dataset had a fair number of observations, but still not enough to allow an increase in the lag length, to allow better exploration of the research hypotheses. The orders of integration for the variables approached made the attempt to use the regression between first differences not applicable.

We hope that, as datasets increase in number of observations, we will be able to pursue the research hypotheses defined in this paper, in the future. The topic is very important for the economy and society, and sound results obtained from analyses can contribute to the better understanding of the phenomenon. Furthermore, the intention of the authors is to expand the study, first at the level of the European Union, in the hope to achieve more significant outcomes.

References

[1] Atoyan, M. R., Christiansen, L. E., Dizioli, A., Ebeke, M. C., Ilahi, M. N., Ilyina, M. A., ..., & Raei, M. F. (2016). *Emigration and its economic impact on Eastern Europe*. International Monetary Fund.

[2] Blouchoutzi, A., & Nikas, C. (2014). Emigrants' remittances and economic growth in small transition economies: The cases of Moldova and Albania. *Journal of Economics and Business*, 17(2), pp. 97-117.

[3] Borjas, G. J. (1995). The economic benefits from immigration. *Journal of Economic Perspectives*, 9(2), 3-22.

[4] Borjas, G. J. (2019). *Immigration and economic growth* (No. w25836). National Bureau of Economic Research.

[5] Boubtane, E., Coulibaly, D., & Rault, C. (2013). Immigration, growth, and unemployment: Panel VAR evidence from OECD countries. *Labour*, 27(4), pp. 399-420.

[6] Boubtane, E., Dumont, J. C., & Rault, C. (2016). Immigration and economic growth in the OECD countries 1986-2006. *Oxford Economic Papers*, 68(2), pp. 340-360.

[7] Bove, V., & Elia, L. (2017). Migration, diversity, and economic growth. *World Development*, 89, pp. 227-239.

[8] Chiswick, C. U., Chiswick, B. R., & Karras, G. (1992, December). The impact of immigrants on the macroeconomy. In *Carnegie-Rochester Conference Series on Public Policy*, 37, pp. 279-316, North-Holland.

[9] Friedberg, R. M., & Hunt, J. (1995). The impact of immigrants on host country wages, employment and growth. *Journal of Economic Perspectives*, 9(2), pp. 23-44.

[10] Giles, D. (2011). *Testing for Granger Causality.* Retrieved from https://davegiles. blogspot.com/2011/04/testing-for-granger-causality.html.

[11] Hacker R. S., & Hatemi-J, A. (2003). *Tests for Causality Between Integrated Variables Based on Asymptotic and Bootstrap Distributions*. Working Paper 2003:02, Department of Statistics, Lund University.

[12] Hanson, G. H. (2012). Immigration and economic growth. *Cato J.*, 32, p. 25.

[13] http://www.oecd.org/migration/OECD%20Migration%20Policy%20Debates%20Numero%202.pdf.

[14] Kindleberger, C. P. (1965). Emigration and economic growth. *PSL Quarterly Review*, 18(74).

[15] Madhavan, M. C. (1985). Indian emigrants: numbers, characteristics, and economic impact. *Population and Development Review*, pp. 457-481.

[16] Morley, B. (2006). Causality between economic growth and immigration: An ARDL bounds testing approach. *Economics Letters*, 90(1), pp. 72-76.

[17] Muller, T. (1989). Immigration Policy and Economic Growth. *Yale Law & Policy Review*, 7(1), pp. 101-136.

[18] Neal, L., & Uselding, P. (1972). Immigration, a Neglected Source of American Economic Growth: 1790 to 1912. *Oxford Economic Papers*, 24(1), new series, pp. 68-88.

[19] NSI (2020a). *POP309D − Permanent emigrants by country of destination metadata*. Retrieved from http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table.

[20] NSI (2020b). *POP310D − Permanent immigrants by country of origin metadata.* Retrieved from http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table.

[21] NSI (2020c). *POP310D − Permanent immigrants by country of origin metadata.* Retrieved from http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table.

[22] Păunică, M., Manole, A., Motofei, C., & Tănase, G.L. (2019). The Impact of Remittances on GDP and Household Consumption. An European Union Countries Analysis. *Economic Computation & Economic Cybernetics Studies & Research*, 53(4), pp. 97-114.

[23] Păunică, M., Manole, A., Motofei, C., & Tănase, G.L. (2018). The Globalization in the actual Context of the European Union Economy. *Proceedings of the International Conference on Business Excellence*, 12(1), pp. 739-750.

[24] Rapoport, H., & Docquier, F. (2006). The economics of migrants' remittances. *Handbook of the economics of giving, altruism and reciprocity*, 2, pp. 1135-1198.

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Real Convergence in the European Union: Insightful Evidence from the New Member States

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Abstract

The European Economic Communities have been established in the second half of the last century in order to promote cooperation instead of confrontation, endowing the Western European countries with the appropriate means to perform the values of a modern economic integration process, based on sustainable and long-term development. With the advancement of the integration process, one of the main objectives of the European Union aimed the economic, social and territorial convergence between and within countries and regions. The main purpose of the paper is to study income convergence in the European Union between 1995 and 2018, using β- and σ-convergence indicators. The results of our study confirm the (absolute) β-convergence hypothesis, as poorer European countries experienced a higher catching-up speed comparing to the developed Member States from Western Europe. Furthermore, the catching-up process in the New Member States was accompanied by a reduction in the income gaps between countries (σ-convergence). These trends are encouraging for the European Union and confirm its potential to assure economic convergence between its Members.

Keywords: European Union, real convergence, New Member States.

JEL Classification: O40, O52, O57.

1. Introduction

The establishment of the European Economic Communities has changed the facet of the European continent, transforming war in peace and enemies in friends. Taking into consideration the success of the first initiatives of integration, more and more countries expressed their willingness to become part of the European group. The expansion of the European Union was accompanied not only by

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opportunities, but also by complex challenges. Nowadays, one of the main challenges that threatens the regional stability and prosperity derives from the persisting income gaps between its Members. The main purpose of this paper is to study real convergence in the European Union, by taking into consideration the evolution of GDP per capita between 1995 and 2018, trying to respond to the question if the New Member States are catching-up or lagging behind. In this respect, we have calculated the (absolute) β- and σ-convergence, illustrating that the average catching-up speed was around 2% per year in the European Union and approximately 3% in the New Member States. The paper is structured as follows: the first section illustrates the researchers' perspectives in the field of economic growth and convergence, also comparing the performances of the New and Old Members; the following section presents the methodology used in order to test the hypotheses of the paper, which is based on the neoclassical growth model assumptions. The main findings of the β- and σ-convergence tests are depicted in the fifth part of the paper, while the final section contains the conclusions, together with the limitations and future direction of research.

2. Problem Statement

The topic of real convergence has become increasingly studied with the subsequent waves of expansion of the European Union. Convergence has been examined in relationship with the economic growth theories, researchers being interested in identifying the main determinants of the different growth rates between countries and regions. Moreover, analysts focused on the perspectives of the poorer countries to catch-up with the level of the developed ones, as stated by the neoclassical growth model assumptions. Studies approaching the topic of income convergence with a strong focus on Central and Eastern Europe region or which contain in-depth comparisons between the two group of countries (New versus Old Members) were conducted by Kaitila (2004), Cuñado & Perez de Gracia (2006), Matkowski & Próchniak (2007), Reza & Zahra (2008), Rapacki & Próchniak (2008), Dobrinsky & Havlik (2014), Kaitila (2014), Matkowski et al. (2016), Grela, et al. (2017), Alcidi et al. (2018). Kaitila (2004) analysed the process of income convergence calculating the β- and σ- coefficients between 1960 and 2001. Referring to the Old Member States (15), the analyst identified two periods of convergence, between 1960-1973 and 1986-1991, divided by a period of stagnation (1973-1976). Kaitila also examined the evolutions that occurred in the Central and Eastern European countries that joined the European Union in 2004, identifying a catching-up process between 1993 and 2001 and higher growth rates compared to the Old Member States. Similar conclusions were reached by Matkowski & Próchniak (2007), who examined income and cyclical convergence in the European Union. The results of the study carried out by Matkowski & Próchniak confirmed a process of income convergence in the Central and Eastern European countries between 1993 and 2004. The analysis performed by Bâzgan (2019) revealed that large fiscal improvements in the EU countries had a less

positive effect on the development of economic growth than fiscal adjustments based on medium-sized consolidation.

In another paper, Matkowski, et al. (2016) studied absolute convergence in the New Member States compared to Old Member States group (15) between 1993 and 2005 using β- and σ-convergence. The analysts concluded that the group of ex-communist states registered annual growth rates reaching on average 3.2%, while the EU (15) only 1.5%. In order to capture in detail, the growth trends, Matkowski et al. divided the temporary horizon into 3 subsections. In the 1993-2000 sub-period, which marked the transition from the centralized economy to the market economy, the average growth rate in the Central and Eastern European group was around 3.3%, while in the West of the continent it was 2.8%. The period 2000-2007 was characterized by an intensive economic advance of the New Member States with average annual rates of 6%. In contrast, in the period 2007-2015, the financial and economic crisis hampered the economic growth in both groups, so that the catching-up speed was below 1% for the both groups of countries.

Dobrinsky & Havlik (2014) were interested in studying real convergence in the New Member States before and after the accession to the European Union. In this respect, the analysis studied σ- and β- (absolute and conditional) convergence between 1995 and 2011. Analysts have found evidence in favour of the absolute β-convergence assumption, the convergence rate of the Member States being around 2% per year. By calculating the values of σ-convergence, the analysts identified a general trend of reduction in the income gaps in the European Union (27). At the same time, Dobrinsky & Havlik studied conditional convergence, including as explanatory variables the labour cost, the internal and external savings (% GDP), and the share in international trade. The results of the conditional convergence model also suggest a catching-up speed around 2% per year.

In line with the previous studies, Grela et al. (2017) identified an average catching-up speed around 2% per year in the European Union between 1997 and 2004. In order to estimate the conditional convergence, Grela expanded the absolute convergence model by including the investment rate, the labour supply and the population growth rate. In this respect, the analysts pointed out that the first two indicators had a positive and significant influence on the GDP per capita growth rate, while the population growth rate had a negative impact. As in the case of the absolute model, the catching-up speed was around 2% in the conditional framework. On the other hand, Nicolescu & Dragan (2020) explored the influence of age, level of education and investments on the employment rate of non-EU immigrants. The results showed that the highest impact on the employment rate is found in the case of non-EU immigrants with age between 18-34 and 35-64 years and with a tertiary level of education. However, the analysts illustrated that income convergence in the New Member States was hampered by the economic and financial crisis, which resulted mainly in a decrease of FDI inflows in this group of countries.

3. Aims of the Research

The purpose of this paper is to examine real convergence in the European Union, by taking into consideration the evolution of the income per capita between 1995 and 2018. In this respect, we have tried to perform a comparative analysis between the New and Old Member States with the purpose of identifying if the former group is catching-up or lagging behind. Consequently, one of the main objectives of our research was to test the assumption that the countries that joined the European Union in the 2000s experienced a higher speed of convergence as reflected by the β-coefficient, compared to the Old Member States. Another purpose of this paper was to examine if the income disparities, as reflected by the σ-convergence, diminished between and within the two sub-groups. Overall, we have tried to respond to the question whether the objective of real convergence can be reached in an enlarged European Union.

4. Research Methods

Convergence is a complex process that can be analysed from multiple perspectives. In this paper, we have tried to study the evolution that occurred in the European Union between 1995 and 2018, using cross-sectional data approaching the values of GDP per capita (as % of EU average) for 27 Member States, which was obtained from Eurostat database. First of all, we have examined the aggregate evolution of income between 1995 and 2018 by comparing the performances of two sub-groups of countries: the Old Member States (14) – which comprises the founding Members (with the exception of Luxembourg) and the countries that joined the European Union in the last century – and the New Member States (13) – which includes the Central and Eastern European countries, Cyprus and Malta.

In the second section of the paper, we have tried to study the (absolute) β-convergence and σ-convergence for all 27 Member States, by focusing on the evolutions which occurred in the New Member States group. In this respect, our quantitative study is based on the neoclassical growth model assumptions, which were initially stated by Solow (1956). From Solow's perspective, the differentials in growth rates between countries are determined by the volume of physical capital, the economies being in different stages of economic growth. The neoclassical growth model suggests that countries will reach the same level of development in the long run.

In close relationship with the neoclassical growth model assumptions, there are the concepts of β- and σ-convergence applied by Barro & Sala-i-Martin. The former approaches a potentially negative relationship between the initial level of GDP per capita (in our case 1995) and the subsequent growth rates, while σ-convergence studies if the income gaps are diminishing in time.

In order to study the absolute β-convergence, we have computed a simple linear regression, where the depended variable is the GDP per capita growth rate between 1995 and 2018 and the independent variable is the logarithm of the initial income:

$$\frac{1}{T}[\frac{y_{it}}{y_{i0}}] = a + \beta_1 ln(y_{io}) + \varepsilon \quad (1)$$

y_i = GDP per capita in economy "i"
y_{i0} = the initial level of GDP per capita

β-coefficient, which reflects the speed of convergence was calculated based on the following formula:

$$\beta = -\frac{1}{T} ln(1 + \beta_1 T) \quad (2)$$

T = period of time

In order to examine if the GDP per capita disparities between the Member States diminished during the 24-year period, we have studied the evolutions of σ-convergence taking into consideration both the standard deviation of the logarithms (equation no. 3) and the coefficient of variation (equation no. 4 and 5).

$$\sigma log_t = \sqrt{(\frac{1}{n}) \sum_{i=1}^{N} [\log (y_{it}) - \log (\mu_t)]^2} \quad (3)$$

y_{it} = GDP per capita of economy "i"
μ_t = arithmetic average of y_{it}

$$\sigma_t^2 = (\frac{1}{n}) \sum_{i=1}^{N} [(y_{it}) - \mu_t]^2 \quad (4)$$

$$\sigma = \sqrt{\sigma^2}, \quad CV = \frac{\sigma}{\mu} \quad (5)$$

5. Findings

Figure 1 compares the values of the GDP per capita in the New Member States in 1995 and 2018, also illustrating the growth rate over the 24 years for each country. Having in 1995 an average GDP per capita around 30% of the European Union's average, the three Baltic States experienced impressive economic growth rates, as follows: Lithuania 145% (GDP per capita in 1995 was 32.7 PPS and in 2018 was 80.2 PPS), Estonia 131% (GDP per capita in 1995 was 35.4 PPS and in 2018 was 81.6 PPS) and Latvia 126% (GDP per capita in 1995 was 30.3 PPS and in 2018 was 68.6 PPS). Other countries that have been catching-up since 1995, being closer to the Community's average are Romania, which more than doubled its GDP per capita, and Poland, with an increase by 65%. In opposition with the general trend of this group of countries, Malta experienced a negative economic growth rate, its GDP per capita decreasing from 94.3 PPS to 89.2 PPS.

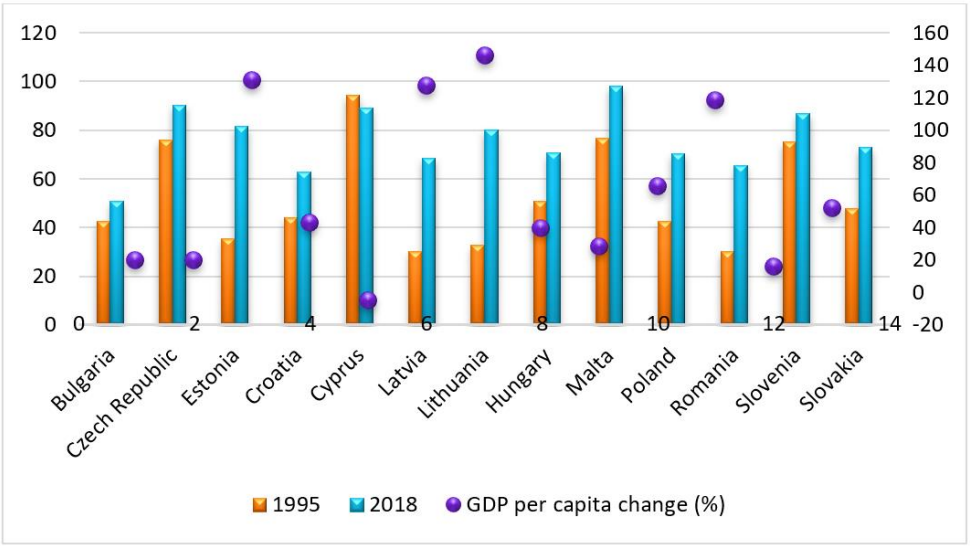

Figure 1. GDP per capita in the New Member States (PPS as % of EU average)
Source: Authors' processing based on data provided by Eurostat)

In contrast with the evolutions that occurred in the New Member States group, the Old Member States experienced a rather negative trend, mainly the Southern European countries. In this respect, Greece recorded a reduction in its GDP per capita relative to the EU average by 25%, while Italy by 29%. The only country in this group that experienced an increase of its GDP per capita during the 24-year period was Ireland.

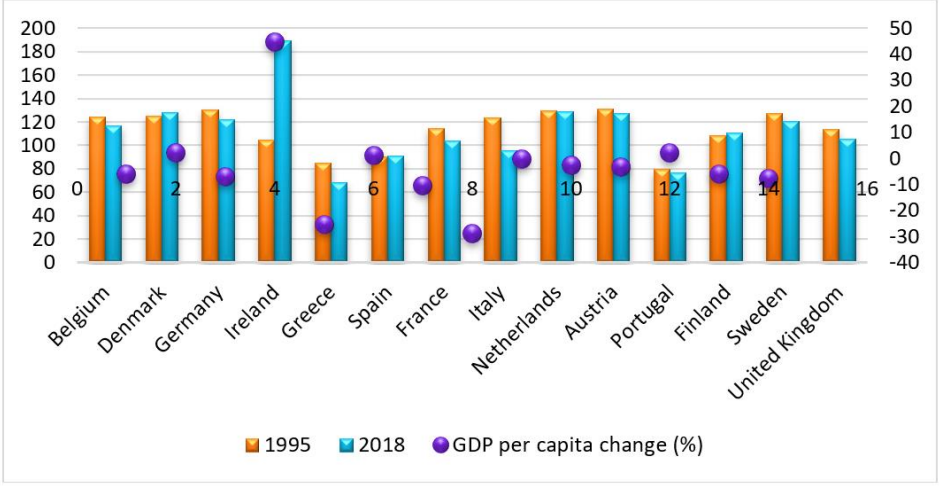

Figure 2. GDP per capita in the Old Member States (PPS as % of EU average)
Source: Authors' processing based on data provided by Eurostat

The analysis of the evolutions which occurred in the two subgroups of countries is continued by the study of the neoclassical growth model assumptions. In this respect, we have calculated the absolute β-coefficient, trying to capture the catching-up speed of the Member States between 1995 and 2018. Figure 3 illustrates the average GDP per capita growth rates between 1995 and 2018 in respect to the initial logged GDP per capita (PPS as % of EU average). As shown in Figure 1, the most impressive GDP per capita growth rates were experienced by the three Baltic States. The average growth rates per year in these states were 3.8% in Lithuania, 3.5% in Estonia and 3.5% in Latvia. Moreover, Romania and Poland experienced a catching-up speed which reached on average 3.3% and respectively, 2.1% per year. In the Old Member States subgroup, as shown above, a significant improvement of the GDP per capita was recorded by Ireland. This country experienced on average a GDP per capita growth rate of 2.4% per year. In contrast, there are also countries, mainly from Western and Southern Europe, which experienced annual reductions in GDP per capita (PPS as percentage of the EU average). For example, France experienced an average GDP growth rate of -0.4% per year, while Greece -0.9& and Italy -1%. These evolutions are posing into question the objective of the European Union to assure a sustainable long term growth for all its Members. Applying the equation no. 2, the average catching-up speed in the European Union was 2.07% between 1995 and 2018.

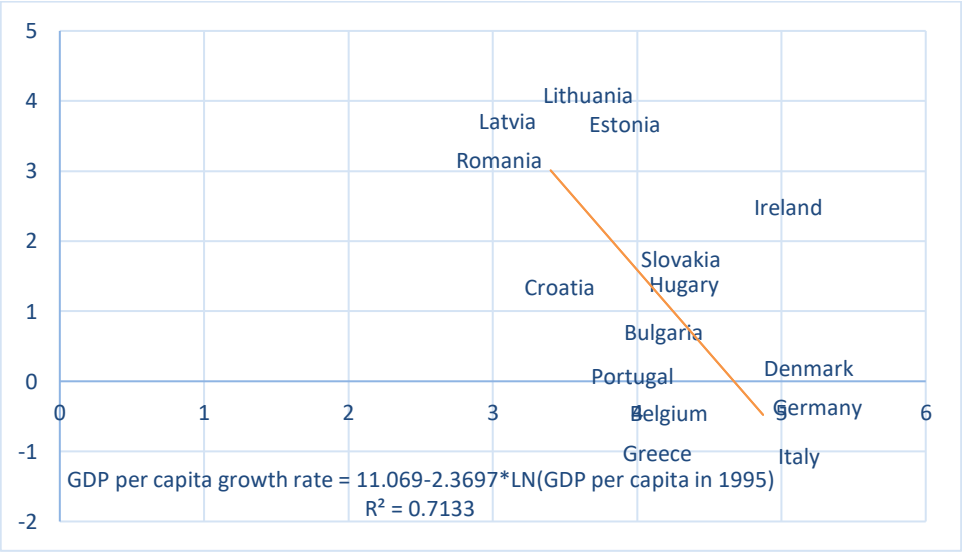

Figure 3. β-convergence in 27 Member States
Source: Authors' computation based on data provided by Eurostat

In order to capture the economic landscape of the last 24 years in the New Member States, Figure 4 illustrates the evolution of the GDP per capita growth rate between 1995 and 2018 relative to the initial income. Similarly, the negative slope of the trend line suggests that initially poorer Member States experienced higher GDP growth rates. As shown above, in the group of the New Member States, the highest GDP growth rates were experienced by Lithuania (3.8%), while the lowest by Cyprus (-0.2314%). As the value of the β-coefficient suggests, the catching-up speed in this group of countries was higher compared to the European Union, reaching on average 3%. The negative sign of the coefficient confirms the negative relationship between the initial level of the GDP per capita and the subsequent growth rates.

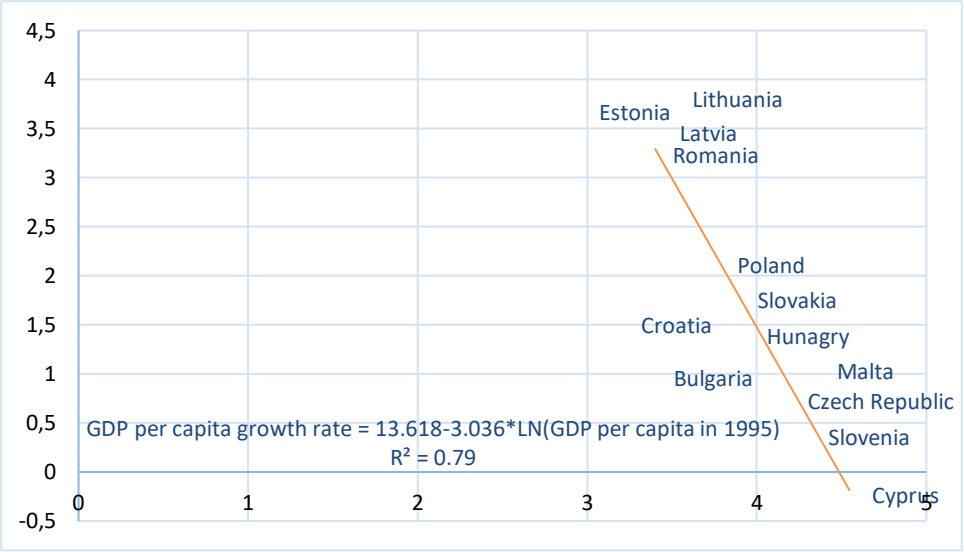

Figure 4. β-convergence in the New Member States (13)
Source: Authors' computation based on data provided by Eurostat

In order to study if the income disparities in the European Union and the two sub-groups of countries diminished between 1995 and 2018, we have tried to calculate the σ-coefficient using 2 measures, the log of standard deviation and the coefficient of variation of the cross-country sample. As suggested by Ram, (2017), these two measures indicate similar trends, but can lead to different amplitude of the annual changes. Figure 5 illustrates the evolution of σ-convergence, which was computed based on the equation no. 3. The income gaps between the 27 member States decreased by 15%. In the New Member States group, the disparities reduced by almost 60%, which suggest that the composing countries became more and more homogenous in terms of income per capita. By contrast, the Old Member States experienced an increase by 45% in the income gaps, as suggested by the values of the standard deviation.

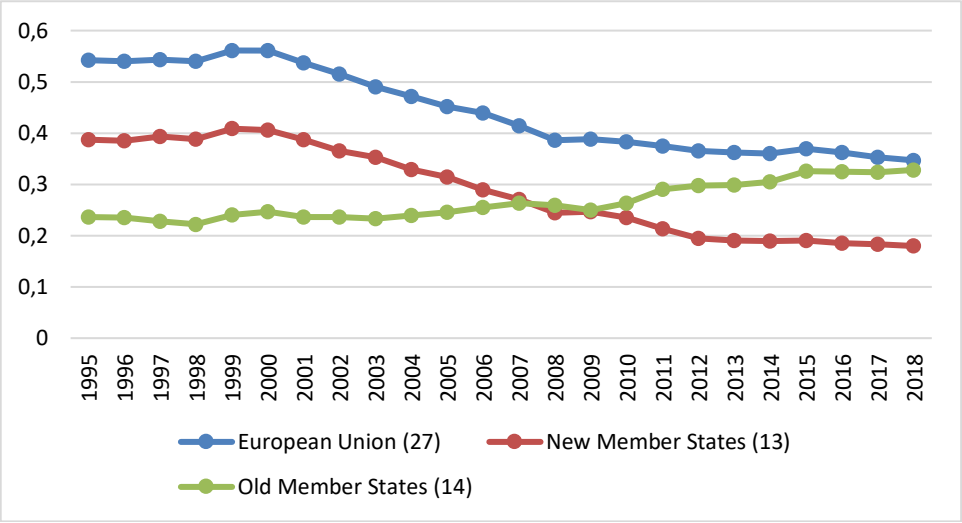

Figure 5. σ-convergence in the European Union based on standard deviation
Source: Authors' computation based on data provided by Eurostat

Figure 6 illustrates the evolution of σ-convergence based on the coefficient of variation. Both methods of calculation lead us to similar findings: the income gaps within the New Member States group decreased between 1995 and 2018, while in the Old Member States increased. As suggested by Ram (2018), the amplitude is different depending on the indicator used for measurement. Consequently, computing σ-convergence as coefficient of variation led us to a reduction in income gaps by 36% in the European Union's group and by 54% for the New Member States cluster. In contrast, the heterogeneity in the Old Member States increased by 39% between 1995 and 2018.

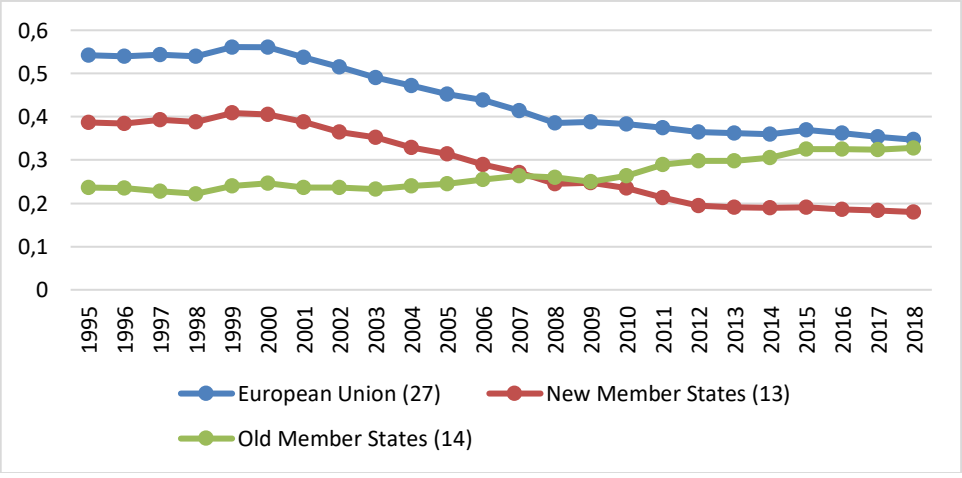

Figure 6. σ-convergence in the European Union based on coefficient of variation
Source: Authors' processing based on data provided by Eurostat

6. Conclusions

The European Union is one of the most powerful economic and political player worldwide, that has gathered under the same common values European countries with different historical backgrounds and heterogeneous economic performances. The accession of the countries from Central and Eastern Europe and of the two Mediterranean islands has remained a key point in the recent history of the European Union and its consequences are still largely discussed. The main purpose of this paper was to study income convergence in the European Union between 1995 and 2018 using β- and σ-convergence. Our findings are in line with the conclusions of the previous studies on this topic, which confirm an average catching-up speed of 2% per year. Similar with other researchers, we have illustrated that the New Member States have experienced a higher catching-up speed, reaching on average 3% between 1995 and 2018. Moreover, we have found evidences in favour of σ-convergence, which measures if the income gaps diminish between and within groups, with the exception of the Old Member States subgroup, where income disparities increased. A limitation of this study derives from the measurement of the GDP per capita: the growth rates obtained by studying convergence based on GDP per capita in PPS as percentage of the EU's average are lower compared with the analysis based on the GDP per capita in euro. Moreover, more Member States experience negative economic growth when taking into consideration the GDP per capita in PPS as percentage of the EU's average, compared with the standard measurement in euro. The analysis could be continued by extending the absolute convergence equation, in order to capture the explanatory variables that might determine the differences in growth rates within the European Union.

References

[1] Alcidi, C. et al. (2018). Income convergence in the EU: a tale of two speeds. CEPS - Policy Brief. Retrieved from: https://www.ceps.eu/ceps-publications/income-convergence-eu-tale-two-speeds/.

[2] Barro, R. J., & Sala-i-Martin, X. (1992). Convergence. *Journal of Political Economy*, 100(2), pp. 223-251. DOI: 10.1086/261816.

[3] Bâzgan, R. M. (2019). Fiscal management on revenue-based or expenditure-based adjustments: an empirical evidence from EU-Countries, *Management & Marketing*. Challenges for the Knowledge Society, 14(1), pp. 163-175. DOI: 10.2478/mmcks-2019-0011.

[4] Cuñado, J., & Perez de Gracia, F., 2006. Real convergence in some Central and Eastern European countries. *Applied Economics*, 38(20), pp. 2433-2441. DOI: 10.1080/00036840500427718.

[5] Dobrinsky, R. & Havlik, P. (2014). Economic Convergence and Structural Change: the Role of Transition and EU Accession. Vienna: The Vienna Institute for International Economic Studies. Retrieved from: https://wiiw.ac.at/economic-convergence-and-structural-change-the-role-of-transition-and-eu-accession-p-3357.html.

[6] Grela, M. et al. (2017). Is Central and Eastern Europe converging towards the EU-15? NBP Working Papers 264. Warsaw: Narodowy Bank Polski. Retrieved from: https://www.nbp.pl/publikacje/materialy_i_studia/264_en.pdf.

[7] Kaitila, V. (2004). Convergence of Real GDP per capita in the EU15. How do the accession countries fit in?. *ENEPRI Working Paper*, No. 25/January 2004, pp. 1-34. Retrieved from: http://aei.pitt.edu/1843/1/ENEPRI_WP25.pdf.

[8] Kaitila, V. (2014). Transnational Income Convergence and National Income Disparity: Europe, 1960-2012. *Journal of Economic Integration*, 29(2), pp. 343-371. DOI: 10.11130/jei.2014.29.2.343.

[9] Matkowski, Z., & Próchniak, M. (2007). Economic Convergence between the CEE-8 and the European Union. Eastern European Economics, 45(1), pp. 59-76. DOI: 10.11130/jei.2014.29.2.343.

[10] Matkowski, Z., Próchniak, M., & Rapacki, R. (2016). Real Income Convergence between Central Eastern and Western Europe: Past, Present, and Prospects. Denmark. Retrieved from: https://www.econstor.eu/handle/10419/146992.

[11] Ram, R. (2017). Comparison of cross-country measures of sigma-convergence in per-capita income, 1960-2010. *Applied Economics Letters*, 25(14), pp. 1-5. DOI: 10.1080/13504851.2017.1391992.

[12] Nicolescu, A. F., Drăgan, G. (2020), Integrating the non-EU immigrants into the EU labour market. An econometric analysis of some of the specific factors, *Management & Marketing*. Challenges for the Knowledge Society, 15(3), pp. 364-380, DOI: 10.2478/mmcks-2020-0021.

[13] Rapacki, R., & Próchniak, M. (2008). The EU enlargement and economic growth in the CEE new member countries. Brussels: European Commission. Retrieved from: https://ec.europa.eu/economy_finance/publications/pages/publication14295_en.pdf.

[14] Reza, R., & Zahra, K. T. (2008). Evaluation of the Income Convergence Hypothesis in Ten New Members of the European Union. A Panel Unit Root Approach. *Panoeconomicus*, 55(2), pp. 157-166. DOI: 10.2298/PAN0802157R.

[15] Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*, 70(1), pp. 65-94. DOI: https://doi.org/10.2307/1884513.

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Business Continuity during the COVID-19 Pandemic. Ways of Working in Romanian Companies

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Abstract

The purpose of business continuity management is to allow an organization to re-establish its critical processes, after the occurrence of a disaster. Business continuity management represents the key for the enterprises to protect themselves against the risks which are inherent in their environment. In this context, multiple development cycles for business continuity have been proposed by various authors, where the aim was to identify and avoid potential risks in order to continue business processes and services without interruption (Gibb and Buchanan, 2006). Besides the technical backups, the Business Continuity Management must include also social aspects. It has been discovered that service disruptions have a significant negative effect on customers' loyalty.

In this paper, we present and develop the following questions: What is business continuity management and why does an enterprise need a business continuity plan? Did the companies in Romania previously create and test business continuity plans? Are the companies in Romania ready to follow their business continuity plans and continue the activity during this COVID-19 pandemic?

To develop the previously mentioned questions, a quantitative research based on a questionnaire has been applied on a sample of 140 people who are working in various companies in Romania. The main purpose of the research is to identify if the companies in Romania are ready to face this pandemic period.

The result is that enterprises in Romania have already developed business continuity plans and they are ready to continue most of their activities during this period, but they haven't tested, nor reviewed the continuity plans regularly.

This case study presents new insights of current practices in Romania during COVID-19 pandemic for a better understanding of business continuation in an organization, besides analysing the literature and highlighting the prerequisites of a Business Continuity Plan.

Keywords: business continuity plan, companies in Romania, pandemic, business continuity management, organizations, crisis management.

JEL Classification: M20

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1. Introduction

Most professionals agree that, to succeed, business executives spend considerable time analysing the market, developing and deploying strategies, to define performance and financial objectives, to establish and execute operating plans, to report financial results and to communicate with the parties' stakeholders. Most would also agree that, before the global preparation for the transition to the year 2000, business continuity management was not an important priority for all business executives.

Crisis management is based on methods that deal with both the reality and the perception of crises. These methods are documented in a business continuity management plan. Crisis management also uses indicators to define which scenarios constitute a crisis and must therefore trigger the necessary intervention mechanisms. It concerns communication during the phase of reaction to an emergency.

The business continuity plan must be well established, thoroughly tested and in line with the business needs, in order to increase the likelihood of successful recovery of vital documents for the organization.

This paper is organized in two sections. The first part presents the origins and the development over the years of Business Continuity Management. The focus in this part is on how Business Continuity Management evolved and on a conceptualization of the possible strategic role of Business Continuity Management. The second part is represented by the research done in various companies across Romania to exhibit their Business Continuity practices during COVID-19 pandemic.

The main purpose of this research is to generate a better understanding of current practices of Business Continuity Management in small, medium and large sized companies across Romania and to recommend some key actions to be considered by organizations on the journey to improve the resilience to crisis situations.

2. Problem Statement

Business continuity management is the process by which an organization prepares for future incidents that could threaten its primary mission and its long-term viability. These incidents can be local events, such as a building fire, regional events, such as an earthquake, or global events, such as a pandemic. The main components of business continuity management are: management support, risk assessment and reduction, impact analysis, business recovery and business continuity strategy, awareness and training, tests and maintenance. The management support must demonstrate that it supports the development, maintenance and proper execution of a business continuity plan by allocating appropriate resources, personnel and budgets.

Additionally, the risk assessment and reduction must identify potential risks from threats such as fire or flood and determine their likelihood and potential impact on the business. These tasks must take place on site and in the various departments of the company, so that the risks associated with all credible events are understood and properly managed.

Furthermore, impact analysis is used to identify the business processes that play a key role in preserving the functioning of business units in the event of a disaster, and to determine when they must be completely restored.

Thus, business recovery and business continuity strategy focus on the measures, people and resources required to re-establish a critical business process. For a proper execution of the plan, it is crucial to inform about the business continuity management program and the continuity plans, as well as to raise awareness among the parties concerned. The business continuity development represents the main goal, alongside with proactive management and having a readiness to handle any type of incidents (Păunescu, Popescu, and Blid, 2018).

Also, the key to successfully face a possible incident is having an organizational learning system in place because it will help the activity to be continued without having any disruptions as the knowledge propagation is a great mechanism integrated into organizational learning (Bratianu, Prelipcean, and Bejinaru, 2020).

All staff must have scheduled regular tests for the continuity management program and continuity plans. The continuity management systems and the corresponding documentation must be maintained in order to remain relevant and in line with the priorities of the company.

Preparing for emergencies is no longer just for companies located in regions with high seismic activity or threatened by cyclones. In addition to pandemics and natural disasters, it must now take into account anthropogenic disasters, such as an attack. Knowing how to act during an emergency is a key part of preparedness and can do all the difference when every second counts.

An example of a recent emergency event that has affected both large and small companies is the COVID-19 pandemic.

The following figure (Figure 1) shows the actions needed to meet the requirements for business continuity management.

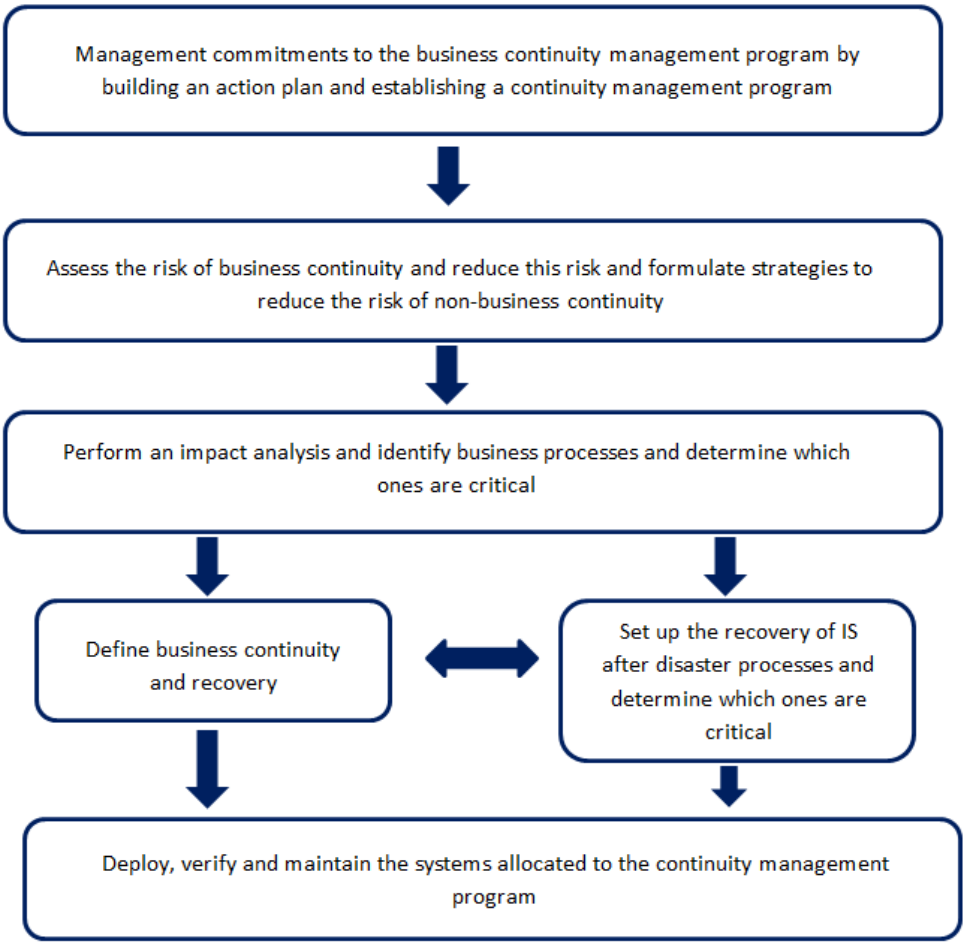

Figure 1. Flow diagram corresponding to the requirements relating to business continuity management
Source: Authors' own contribution

A pandemic is the outbreak of a disease worldwide. An influenza pandemic occurs when a new type of influenza A virus appears against which humans have little or no immunity. This virus then begins to cause serious illness and spreads easily from person to person. Many countries have started to prepare for a pandemic. They identified their critical infrastructure sectors, such as finance, banking, energy, transport and public administration. These sectors must develop business continuity plans aimed at preserving critical business functions during a pandemic. A pandemic can have a devastating economic impact, as it makes staff unavailable, which is likely to result in business disruption. If a pandemic occurs, it is likely to be long-term and general, and may require temporary changes in many parts of society: schools, offices, transport and other public services, in particular.

Business continuity management – evolution over time

It was in the 1970s that the concept of continuity of activity appeared (Rothstein, 2002). Traditionally, the provisions relating to business continuity focus on technical components (recovery plans for computer systems, management of technical incidents, etc.) (Bandyopadhyay, 2000), and the definition of these plans was based on the theory of probabilities applied to planning (in English, "probability-based planning").

It was not really until the late 1990s that business continuity became a concept extended to the entire enterprise, without the definition of plans escaping the intensive use of probability. Therefore, business continuity management is considered to be a constituent part of risk management.

From 2001, driven by the collective awareness following the September 11th attacks, the development of business continuity management is marked by a diversification of approaches and methods. A first set of works gives it a new role, already tending to make it a full-fledged management discipline (Bennasar, 2010), (Besleau, 2008). Thus, to cope with events that have a strong impact and a low probability of occurrence (Bandyopadhyay 2000), we will cite the transition to analysis methods based on impacts instead of methods based on probability.

Since 2006, regulations, standards and certifications play a capital role in the development of what has become a major subject. Banks and insurance companies are among the first companies to advocate the development of business continuity plans in their organizations.

Business continuity management is a form of management, a set of rules on which decision-making is based for the implementation and maintenance in operational condition the procedures, solutions, organizations and know-how aimed at approaching the principle of business continuity. The business continuity plan describes these choices that will have to be made according to the situations in which we will find ourselves.

There are several standards and directives of international scope in terms of business continuity management. The most successful standard in business continuity management is BSI 25999 published in 2006 by the British Standards Institution. This standard follows the work of the Business Continuity Institute and in particular the PAS 56 standard − the specification for business continuity management, published in 2003 (BCI 2007). BS 25999 has been designed to establish the process, principles and terminology related to business continuity management.

BS 25999 served as the basis for the structure of the first standard on business continuity with an international focus (St-Germain et al. 2012). ISO, the main international standardization organization, and more precisely one of its Technical Committees, TC 223, is conducting a series of works on crisis management, resilience and business continuity (Picard 2010). On this last section, there was a publication in May 2012 of a new ISO standard in the 22300 series on social security, a standard which took up all recommendations of the BS 25999.

3. Research Methods

This case study is based on a quantitative research, using the questionnaire. To carry out the survey, we applied the questionnaire starting mid-April until mid-August 2020 to employees in random, different small, medium and large sized companies across Romania. The persons who took part in this survey are working in various industries (accounting, banking, legal, human resources, etc.). In addition, this questionnaire has 22 questions, divided in three sections. A total number of 140 questionnaires were collected.

The main purpose of the research is to generate a better understanding of current practices of Business Continuity Management in small, medium and large sized companies across Romania, to discover which are the vital functions and resources to business operations and to recommend some key actions to be considered by organizations on the journey to improve the resilience to crisis situations.

Four research hypotheses were formulated:

1. Companies in Romania have Business Continuity Plans, but they are not tested, nor reviewed regularly;
2. Companies in Romania are ready to face this pandemic period and the activity can be greatly accomplished when working from home;
3. The productivity of employees increased during this pandemic period;
4. The employees are feeling safe to continue working from home and the companies are still flexible about remote working.

4. Findings

The presentation of the results begins with the visualization of the characteristics of the respondents. A number of 140 individuals responded to the questionnaire that addresses the business continuity during COVID-19 in different small, medium and large sized companies across Romania.

A large number of respondents are working in the HR department (34.29%), while the least popular departments among the survey respondents are the public sector, training and automotive (0.71%). Also, there were participants to this survey who are working in the food industry (8.57%), banking (7.86%), retail (6.43%), sales (5.71%), energy management (5%), oil & gas (4.29%) and shared services (3.57%).

Most of the respondents are working in companies located in Bucharest, Romania (69.29%), the largest city in Romania.

We can notice in Figure 2 below that there were respondents from other cities as well – Timişoara (9.29%), Călăraşi (5.71%), Iaşi (5.71%), Sibiu (4.29%), Galaţi (3.57%) and Ploieşti (2.1%).

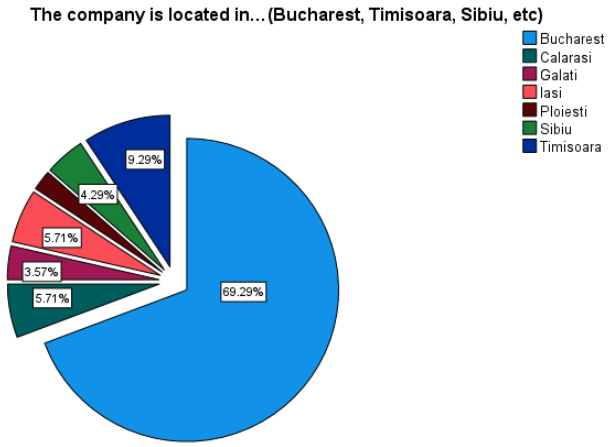

Figure 2. Characteristics of respondents - Cities
Source: Authors' own research results after entering data in SPSS

Regarding the size of the company, most of the respondents are working in companies with a range of 501-1,000 employees (33.57%), followed by the great number of respondents working in large companies of more than 2,000 employees. We can notice in Figure 3 below the statistics.

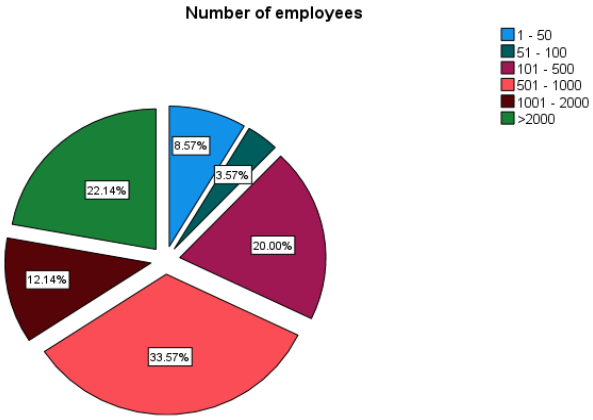

Figure 3. Characteristics of respondents – size of the company
Source: Authors' own research results after entering data in SPSS

The first hypothesis that concerns the companies in Romania who have Business Continuity Plans, but they are not tested or reviewed regularly is demonstrated in the following lines. In Figure 4 we can notice that 88.57% of companies across Romania already have a Business Continuity Plan in place. This means that most of the companies are ready, in theory, to continue their activity following an incident.

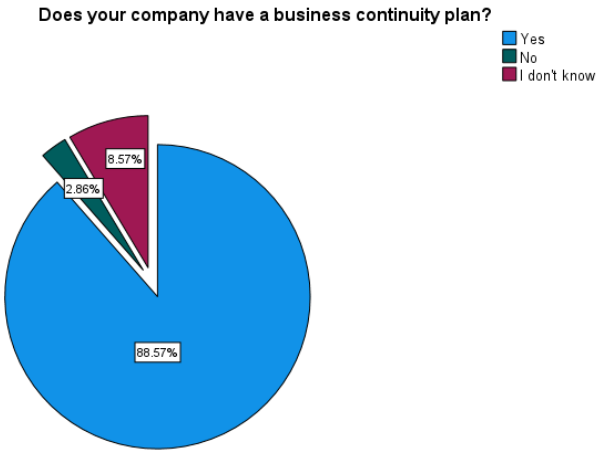

Figure 4. Existence of Business Continuity Plan in companies across Romania
Source: Authors' own research results after entering data in SPSS

As we saw in the above figure, the companies are ready in theory to continue their activity in case of a major emergency. But are they really prepared?

According to the survey respondents, 76.43% confirmed that the companies they are working for do not regularly review the Business Continuity Plan. People learn and induce from previous experiences. We first learn how to use a spoon and then learn how to use forks of different sizes. In Business Continuity Management, we firstly need to practice and test, and then we can adapt and improve the scenarios written in the Business Continuity Plan. Table 1 below shows that most of the companies (49.3%) did not test the BCP scenarios within the last 12 months, but there is also a considerable percentage of 30.7% of companies who did test the scenarios, which means companies across Romania do have BCPs but they are not so interested in testing them regularly.

Table 1. BCP being tested in companies across Romania

Has the BCP been tested within the last 12 months?

	Frequency	Percentage
Yes	43	30.7
No	69	49.3
I don't know	28	20.0
Total	140	100.0

Source: Authors' own research results after entering data in SPSS

The second hypothesis, which relates to the fact that the companies in Romania are ready to face this pandemic period and the activity can be greatly accomplished when working from home it's also tested and demonstrated.

In terms of remote working or working from home, all we need is to have a laptop with all required tools and systems installed, Internet connection and access to vital documents, as well as an organizational learning system. In our digital era, we are able to rely on technology and lucky to have back-up methods well-structured to continue the activity. From 140 respondents to this survey, 96 confirmed that the companies they are working for copy or back-up the organization information, which means 68.57% of them can easily work from home/remotely.

In addition, when developing the Business Continuity Plan, the companies must have an IT recovery plan. A significant percentage of companies across Romania included this aspect in their BCPs (65.71%), which can be noticed in Figure 5 below.

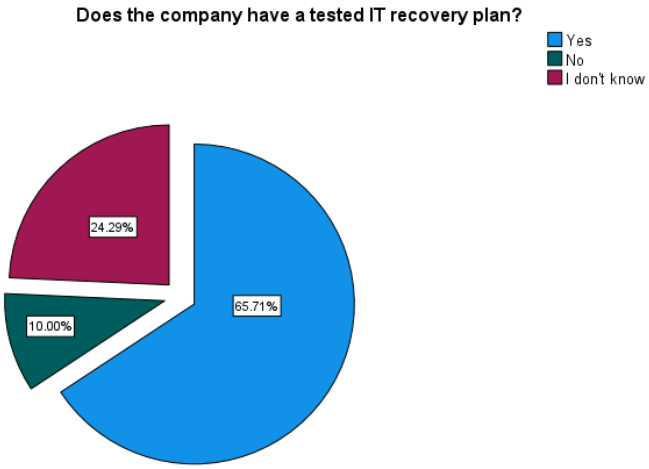

Figure 5. IT recovery plan
Source: Authors' own research results after entering data in SPSS

Furthermore, in case of a service disruption, it is important to keep the key staff or the stakeholders informed about the emergency situation. This aspect should be also included and tested in each Business Continuity Plan & Strategy. While 6.43% of companies across Romania do not have a method to communicate with the stakeholders or key staff and 10% do not know about any method, 83.57% of companies tested and implemented a tool or way to communicate and ease the period of a service disruption.

All above things being considered, we can notice that employees of most of the small, medium and large sized companies across Romania can definitely face this pandemic period, continue their activity and accomplish all tasks, while working from home.

Regarding the productivity of the employees while working from home, hypothesis 3 shows if it has changed during the period of working from home. While the employers considered that the productivity can be impacted during this

period and the employees can be distracted by the family members, children, pets or any other factors, 49.29% of the respondents strongly agree that the productivity has increased during this period of working remotely. In Figure 6 we can notice that more than 72.15% out of 141 respondents consider that the productivity has increased, which demonstrates hypothesis number 3.

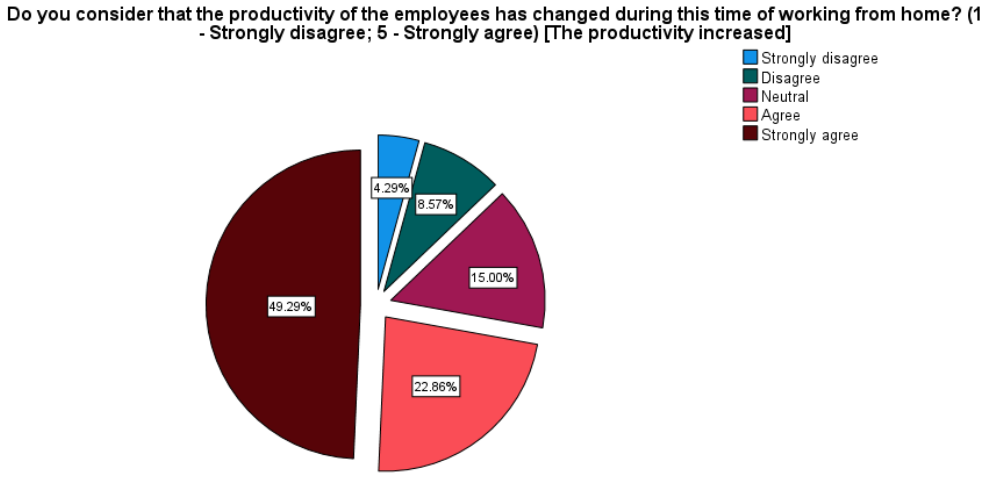

Figure 6. Productivity of employees while working from home
Source: Authors' own research results after entering data in SPSS

On May 18th, 2020, the state of emergency in Romania was lifted and we resumed some of the activities or habits that we previously had, but with certain limits. Hence, the offices could be re-opened and the employers had to decide whether they wanted to continue their activity remotely or not.

In this regard, we have formulated hypothesis 4 and the last one for this study, which concerns whether the employees are feeling safe to return to the office or not.

When asked how they felt (the employees) about returning to the office, the majority, which means 53.57% out of 140 respondents, confirmed that they had mixed feelings. The government didn't provide specific guidelines for the return to office and the employees were concerned. The employees confirmed that they feel safe continuing working from home, rather than returning to the office, even if the safety requirements are met.

In Figure 7 below we can notice that 57.86% of companies are still flexible about working from home, while 7.14% of the respondents confirmed that their companies imposed the return in the office on May 18th, 2020. The companies that required the presence in the office of the employees are activating in the public sector, retail or sales industry. According to the European Commission, the retail sector is one of the most important sectors in the world. The retail sector represents 18% of the GDP and had an annual growth of 8.13% in 2019, in Romania (Busu, Vargas, Gherasim, 2020).

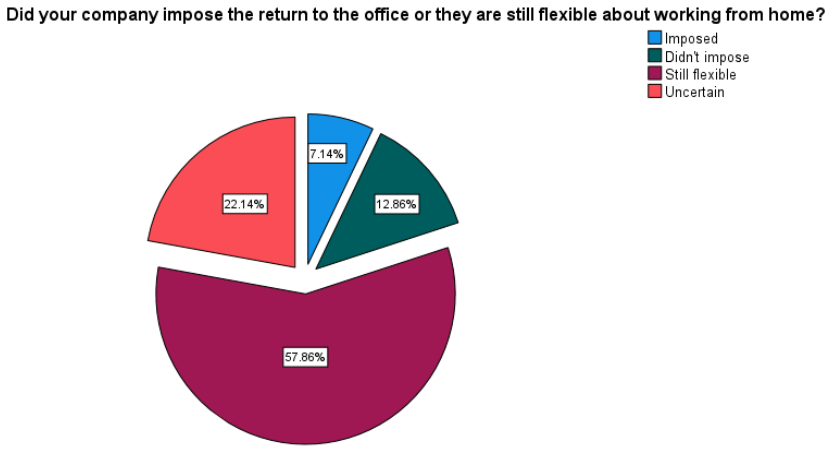

Figure 7. Companies' opinion on continuing working from home
Source: Authors' own research results after entering data in SPSS

Considering the above, the employees are feeling safe to continue working from home and the companies are still flexible about remote working, which demonstrates hypothesis 4.

5. Conclusions

No organization is immune to disruptive events or disruption on duty. Organizations increasingly place quality of service as a strategic issue. However, obtaining this quality of service requires the ability to react to disruptive events without losing control about the system in order to maintain the expected performance. The concept of continuity is born from this will.

In developing a conceptual proposition for BCM to be regarded as having a strategic role, we asked whether firms had strategically oriented BCM in place and, if so, what form this would take in terms of organization and planning. Our analysis offers a synthesis of both concepts and practice to highlight how and why organizations should adopt, integrate and enhance systems to preserve value.

As business continuity becomes more of a mainstream operational reality, strategy researchers should be more attuned to its existence and its cross-functional impact in terms of planning, organizational learning and technological dependencies. Herein lays an opportunity to understand some of the underlying dynamics of organizational behaviour, as organizations prepare for the worst whilst planning for the best. Furthermore, researchers should also be more attuned to the efforts of senior managers to introduce continuity management as part of their new strategies and their attempts to deal with uncertainty.

To conclude, nowadays, the key challenge for the businesses resides in the preparatory process, that is the synchronization of the business continuity plan and procedures with the World Health Organization's and the local health ministry's pandemic alert phases.

References

[1] Asnar, Y., & Giorgini, P. (2008). Analyzing business continuity through a multi-layers model M. Dumas, M. Reichert, & M.-C. Shan, eds. *Business Process Management*, 5240, pp. 212-227.

[2] Bandyopadhyay, K. (2000). Disaster recovery planning by health maintenance organizations: the role of business impact analysis and testing, pp. 16-20.

[3] Bennasar, M. (2010). *Le Plan de Continuité d'Activité et système d'information Dunod*, Paris.

[4] Besleau, E. (2008). *Management de la continuité d'activité: Assurer la pérennité de l'entreprise: planification, choix techniques et mise en oeuvre Eyrolles*. ed., Paris.

[5] Boehmer, W. (2009). Survivability and Business Continuity Management System According to BS 25999 R. Falk et al., eds., IEEE.

[6] Boulos, M. K. N., Lou, R. C., Anastasiou, A., Nugent, C. D., Alexandersson, J., Zimmermann, G., Casas, R. (2009). Connectivity for Healthcare and Well-Being Management: Examples from Six European Projects. *International Journal of Environmental Research and Public Health*, 6(7), pp. 1947-1971.

[7] Bratianu, C., Prelipcean, G., and Bejinaru, R. (2020), Exploring the latent variables which support SMEs to become learning organizations, *Management & Marketing*. Challenges for the Knowledge Society, 15(2), pp. 154-171.

[8] BSI (2006). British Standard Institute standard BS 25999 -1.

[9] Busu, M., Vargas, M. V., Gherasim, I. A. (2020). An analysis of the economic performances of the retail companies in Romania, *Management & Marketing*. Challenges for the Knowledge Society, 15(1), pp. 125-133.

[10] Gibb, F., & Buchanan, S. (2006). A framework for business continuity management. *International Journal of Information Management*, 26(2), pp.128-141.

[11] Herbane, B., Elliott, D., & Swartz, E. M. (2004). Business Continuity Management: time for a strategic role? *Long Range Planning*, 37(5), pp. 435-457.

[12] Hiles, A. (2007). The Definitive Handbook of Business Continuity Management A. Hiles, John Wiley & Sons.

[13] ISO 22301 (2012). International Organization for Standardization. Societal Security-Business Continuity Management Systems − Requirements, Content.

[14] Păunescu, C., Popescu, M. C., and Blid, L. (2018), Business impact analysis for business continuity: Evidence from Romanian enterprises on critical functions, *Management & Marketing*. Challenges for the Knowledge Society, 13(3), pp. 1035-1050, DOI: 10.2478/mmcks-2018-0021.

[15] Picard, J. M. (2010). Societal security: First standards for business continuity and iso 31000. Concepts, simlarities and diffrences. In Congrès LMU. La Rochelle, France.

[16] Rothstein, P. J. (2002). Averting Disaster: Moving Toward Business Continuity Management. HP WORLD Magazine.

[17] St-Germain, R. et al. (2012). Livre Blanc ISO 22301, Sécurité sociétale - Systèmes de gestion de la continuité d'activité.

[18] Tammineedi, R. L. (2010). Business Continuity Management: A Standards - Based Approach. *Information Security Journal a Global Perspective*, 19(1), pp. 36-50.

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Challenges in Education Levels of Generations

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Abstract

Economic growth contributes to changes in education and training. Of great importance are the skills, competences and knowledge that people have when entering the labour market. The level of professional integration is influenced by these aspects. The article presents a comparative situation of the life expectancy of the population in Romania and the European Union. The amount of information is growing. In these conditions, there are all premises for people to be more informed and educated. Due to the aging of the population, measures are needed to adapt the educational process both at the basic level and throughout the life. Interest in adapting to the current demands of the labour market creates conditions for employees to participate in lifelong learning programmes. Thus, for this reason, the aspects regarding the evolution of the level of education of people of different ages are analysed. Implementation of measures to increase investment in education and training leads to a higher level of skills and competences. As a consequence, it can be seen that the number of unskilled workers will decrease. The increase in the degree of adaptability will be an advantage for the workers. They will need to anticipate the need for skills. Lifelong learning can contribute to extending people's professional lives.

Keywords: education and training, education levels, population, Romania, life expectancy.

JEL Classification: I2, N3

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1. Introduction

Worldwide, the number in population is rising (Jianu, I. et al., 2019). Growth has led to increased consumption (Rădulescu, et al., 2018). This raises questions about the possible consequences for the environment, but also for society (Bran, F. et al., 2018).

Unprecedented digital transformations have taken place in recent years, which has led to an increase in the speed of change (Jianu, et al., 2019). The complexity of the modern world has increased. People have the opportunity to be more educated due to access to an enormous, ever-expanding luggage. Also, through digital connections, people have the possibility of interactions much faster than in the past, and space is no longer a barrier (Burlacu, et al., 2018).

There are transformations in the economic, technological and social fields. Thus, measures are needed to make education more prepared for these transformations (Androniceanu, et al, 2017). Due to the aging process, the expected changes to basic education should also be the case for lifelong learning. And when we are talking about the aging process, we are talking about increasing the life expectancy of the population.

At the same time, even education can influence these trends. By providing the necessary skills to the modern world, education can become a powerful tool to reduce inequality (Ionita, & Burlacu, 2009). This can lead to changes in communities and individuals (OECD, 2019). However, an education strategy must take into account the trends that are taking place, as well as the possible ways education can evolve in the coming years. Passive observation of transformations does not lead to progress (Burlacu, 2010, 2011, 2014). Actions that (Stoica, & Burlacu, 2017) can be agreed today must be based on the dialogue and lessons learned from this dialogue (Burlacu, & Jiroveanu, 2009, 2012).

The application of measures to implement a reform in education may be somewhat resilient. Thus, the results of a reform can be visible, verifiable, or interpretable, after a good period of time since the change occurred (Wurzburg, 2010).

The lack of properly trained teachers is one of the reasons for lacking quality education (Androniceanu, & Burlacu, 2017). Another cause is determined by the conditions existing in rural schools (Burlacu, Alpopi, Mitrită, & Popescu, 2019). Quality education also involves teacher education and educational scholarships for poor children, but also improved access to water and hygiene (UN, 2019).

Personal development and widening of individual perspectives can be ensured through participation in education and training programs (Costache, et al., 2015).

Issues of economic recovery can be associated with the creation of new jobs (Burlacu, et al., 2013). The achievement of sustainable growth helps increasing social cohesion (Burlacu, & Neagu, 2007). Measures to achieve this sustainable growth must take into account the global economy, the progress made by the digital industry and the aging population.

Throughout life, in order to increase the capacity for professional integration, it is necessary to acquire knowledge, skills and competences relevant to the labour

market. At present, in the digital era, there is the possibility of acquiring knowledge, skills and competences using computer, electronic resources.

In the article, first, a survey of the life expectancy trend is made. Based on the results obtained, the data on the level of education of the persons aged 25-34 and 55-64 respectively are analysed, by comparison. The research was conducted for the information available for the past 12 years, 2007-2018 for the level of education, respectively 2005-2016 in the case of life expectancy. By comparing the data, it is desirable to identify changes in the level of education for people in the two age groups (25-34 years, respectively 55-64 years).

2. Education Levels

The improvement in the skills and competences needed by the workforce can be achieved by investing in education and training. Rapid changes in the labour market require the anticipation of skills needs. Intervention in education and training systems is also due to changes in technological flows, changes in the environment due to climate change as well as demographic changes and trends. Thus, the prolongation of professional life can be achieved through access to quality education and training programs provided through lifelong learning.

At the same time, human and civic values are preserved and passed on to future generations through education and training (EC, 2015). From this point of view, the following figure shows the evolution of life expectancy at birth for Romania and the European Union (years).

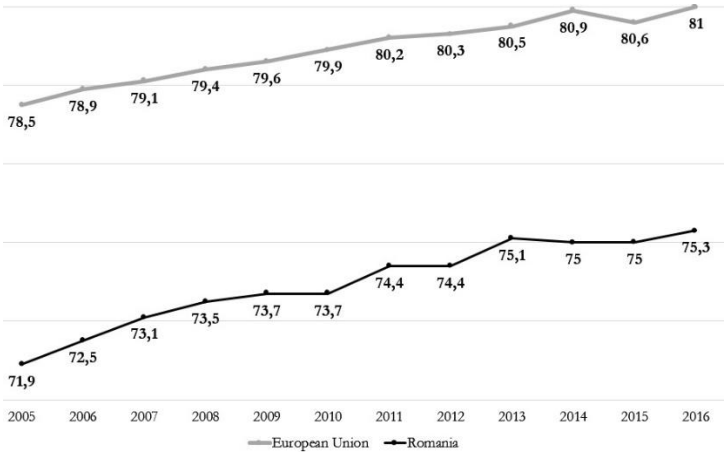

Figure 1. Life expectancy at birth

Source: Own processing according to data published by Eurostat (2019)

Figure 1 shows that for the period 2005-2016, life expectancy has an increasing trend both for the population of Romania and for the population of the EU Member States. Thus, life expectancy for the Romanian population increased from 71.9 years in 2005 to 75.3 years in 2016.

Since levels 0-2 correspond to lower than primary, lower and lower secondary levels, levels 3-4 correspond to upper secondary and post-secondary non-tertiary education, and levels 5-8 correspond to tertiary education, Table 1 presents a comparison of population by educational attainment levels for age groups 25-34, 55-64 and 15-64 respectively, for 2018, in Romania and the European Union (%).

Table 1. Population by educational attainment level, EU and Romania (%)

		25-34 years		55-64 years		15-64 years	
		2007	2018	2007	2018	2007	2018
levels	UE	20.6	15.8	41.7	29.6	32.8	25.6
0-2	RO	21.2	22.9	45.7	26.4	30.9	26.4
levels	UE	49.4	44.4	40.8	47.1	46.6	45.9
3-4	RO	62.2	52.0	45.3	64.2	59.1	58.1
levels	UE	30.0	39.8	17.5	23.2	20.5	28.5
5-8	RO	16.6	25.1	9.0	9.4	9.9	15.5

Source: Own processing according to data published by Eurostat (2019)

According to the data presented, both in Romania and the EU in 2018, the share of the population aged 55-64 with the level 0-2 of education decreased compared to 2007. Also, in 2007, the share of population aged 55-64 with the level 0-2 of education was almost the double of the population aged 25-34. At the same time, from the data analysis for the level 0-2 of education of the population in the 15-64 age group, we notice a decrease in the values for the year 2018 as compared to 2007. Considering the large period of years (from 15 to 64 years), we can assume that the new technologies applied, the new technological processes used in different products, have made individuals update their skills, acquire new skills, acquire new levels of qualification. These changes were mainly for people under the age of 55. In order to be able to continue their professional activity and to keep up with the new changes imposed by technology, they have had to follow education and training programs that have provided them with the necessary skills in the workplaces but have also offered them higher levels of education. This is particularly evident from the comparison of data on the share of the population with education level 3-4 from the 55-64 age group. In Romania and at EU level, in 2018 the weights were higher than in 2007. However, the interest of the population in higher education is noticed by comparing the data on the share of the population with the level 5-8 of education in the 25-34 age group. At the EU level in 2018, the share of the level 5-8 of education in the 25-34 age group increased by about 10% compared to 2007. In Romania, the increase was 8.5%. At EU level, growth is noticed for both the 55-64 age group and the 15-64 age group. In Romania, the increase is significant for the 15-64 age group.

Table 2 shows the population by educational level in the Member States of the European Union for 2018 (%).

Table 2. Population by educational attainment level, countries in the EU (%)

	From 25 to 34 years			From 55 to 64 years		
	levels 0-2	**levels 3-4**	**levels 5-8**	**levels 0-2**	**levels 3-4**	**levels 5-8**
European Union	15.8	44.4	39.8	29.6	47.1	23.2
Austria	11.3	48.4	40.3	20.7	55.8	23.5
Belgium	15.0	38.3	46.7	35.1	34.4	30.5
Bulgaria	16.5	49.4	34.2	19.4	57.2	23.4
Croatia	5.4	60.0	34.5	25.3	56.1	18.6
Cyprus	10.9	31.0	58.2	32.6	40.2	27.2
Czech Republic	6.2	60.2	33.6	9.2	73.8	17.0
Denmark	16.8	36.5	46.7	25.3	44.4	30.3
Estonia	12.2	44.0	43.7	10.9	51.8	37.3
Finland	9.3	50.5	40.2	16.0	44.6	39.4
France	13.2	40.4	46.3	32.6	43.7	23.7
Germany	13.1	54.8	32.1	13.6	60.1	26.3
Greece	12.6	44.4	43.0	44.7	33.5	21.8
Hungary	13.4	56.1	30.5	19.7	62.3	18.0
Ireland	7.3	37.4	55.3	33.1	36.2	30.7
Italy	24.3	48.0	27.7	49.9	37.1	13.1
Latvia	11.0	47.4	41.6	6.8	67.7	25.5
Lithuania	5.8	39.0	55.2	3.4	66.8	29.9
Luxembourg	12.7	34.7	52.6	33.0	40.8	26.2
Malta	30.8	30.9	38.3	70.8	19.5	9.6
Netherlands	13.1	39.4	47.5	31.7	39.5	28.8
Poland	5.6	50.9	43.5	12.1	72.5	15.4
Portugal	29.3	36.2	34.5	72.3	13.7	14.0
Romania	22.9	52.0	25.1	26.4	64.2	9.4
Slovakia	8.3	55.3	36.4	11.6	72.7	15.7
Slovenia	5.8	53.0	41.2	21.0	58.1	20.8
Spain	32.8	23.5	43.6	54.5	20.6	24.8
Sweden	12.4	39.9	47.7	19.7	48.2	32.1
United Kingdom	14.5	37.3	48.2	26.9	39.0	34.1

Source: Own processing according to data published by Eurostat (2019)

From the data presented in the table, it is noticed that the countries with the highest proportions of the level 0-2 of education in the 25-34 age group are: Spain (32.8%), Malta (30.8%), Portugal (29.3%), Italy (24.3%) and Romania (22.9%).

Also, the countries with the highest percentages of level 5-8 of education in the 25-34 age group are: Cyprus (58.2%), Ireland (55.3%), Lithuania (55.2%), Luxembourg (52.6%), United Kingdom (48.2%), Sweden (47.7%).

For the 55-64 age group, the countries with the highest proportions of the level 0-2 of education are: Portugal (72.3%), Malta (70.8%), Spain (54.5%), Italy (49.9%), Greece (44.7%).

At the same time, for the 55-64 age group, the countries with the lowest percentages of the population with level 5-8 of education are: Romania (9.4%), Malta (9.6%), Italy (13.1%), Portugal (14%), Poland (15.4%). Also, the countries

with the highest shares are: Finland (39.4%), Estonia (37.3%), Great Britain (34.1%), Sweden (32.1%), Belgium (30.5%), and Denmark (30.3%).

All sectors of the economy are affected by digital transformations in the economy and jobs. These digital transformations require the acquisition and adaptation of skills.

Thus, a competitive environment and the rapidity of technological change require highly qualified personnel.

Companies use continuous training to give employees new skills or to update existing ones.

The skills required to work in a particular profession are in constant evolution. Under these circumstances, the continuous training of employees is a way to support them in their efforts to adapt to the new requirements.

Renewal of skills is a way to adapt to changes in the labour market.

The interconnection of some activities could lead to another type of approach to the link between training and employment (Dubois & Rousset, 2017).

Considering these aspects, another important indicator analysed is the employment rate for people in the 20-64 age group.

Table 3. Employment rate, EU and Romania (%)

		2007	2017
levels	UE	56.9	54,9
0-2	RO	53.1	54.7
levels	UE	71.4	72.6
3-4	RO	65.1	68.7
levels	UE	83.8	84.0
5-8	RO	85.8	87.9

Source: Own processing according to data published by Eurostat (2019)

If for the EU the employment rate increased in 2017 compared to 2007, only for people with level 3-4 of education, in Romania the employment rate increased for the same period of time for people of all levels of education. More pronounced increases are noticed for level 3-4 of education, respectively level 5-8 of education.

We can say that the basis of sustainable development is the achievement of quality education. Thus, through education and training, besides identifying solutions to the problems of a community, the quality of life of the members of the community can be improved (UN, 2019).

3. Conclusions

The comparative analysis showed a change in time of the level of education for people in the two age groups (25-34 years, respectively 55-64 years).

It is thus demonstrated that technological changes have forced the population to become more educated. These transformations influence both the economic and

social spheres. That is why we believe that measures are needed to make education more prepared for these transformations.

The relevance of a vocational education and training system is mainly given by the response that the system gives to the demands and needs of the labour market. Also, a system of education and training must support economic and social development (Milovanovitch et al., 2018).

References

[1] Androniceanu, A., & Burlacu, S. (2017a). Intelligent system for assessment and grading based on docimologic tests. *eLearning & Software for Education*, 2.

[2] Androniceanu, A., & Burlacu, S. (2017b). Integration of educational technologies in universities and students'perception thereof. In *The International Scientific Conference eLearning and Software for Education*, 2, p. 26. " Carol I" National Defence University.

[3] Androniceanu, A., Burlacu, S., Drăgulănescu, I. V., & Nicolae, E. E. (2017, May). New trends of businesses digitalization in Romania and the behaviour young consumers. In *BASIQ International Conference*: New Trends in Sustainable Business and Consumption, Graz, 31, pp. 27-35.

[4] Burlacu, S., & Neagu, C. (2007). E-Learning or electronic systems of training. Management and Marketing, 823.

[5] Burlacu, S. (2010). Role of training in the knowledge society. In *Proceedings of Administration and Public Management International Conference*, 6(1), pp. 203-208. Research Centre in Public Administration and Public Services, Bucharest, Romania.

[6] Burlacu, S. (2011). Characteristics of knowledge-based economy and new technologies in education. *Revista Administratie și Management Public, (RAMP)*, (16), pp. 114-119.

[7] Burlacu, S. (2012). E-Faculty-management software solution for public administration and management faculty. In *Proceedings of Administration and Public Management International Conference*, 2012(8), pp. 74-83. Research Centre in Public Administration and Public Services, Bucharest, Romania.

[8] Burlacu, S. (2014). Integrating the e-learning dimension in the edu-res master's programme. In *Proceedings of Administration and Public Management International Conference*, 10(1), pp. 139-147). Research Centre in Public Administration and Public Services, Bucharest, Romania.

[9] Burlacu, S., & Grosu, O. (2009). E-Learning through remote laboratories: a new research tool for education assistance. *Economy Transdisciplinarity Cognition*, (1), 88.

[10] Burlacu, S., & Jiroveanu, D. (2012). The role of support open source systems to improve the quality of decisions in an educational institution in romania. In *Proceedings of the 6th International Management Conference:* Approaches in organisational management, 15th-16th, November, Bucharest, Romania (pp. 641-647).

[11] Burlacu, S., Alpopi, C., Mitrită, M., & Popescu, M. L. (2019). Sustainable e-Governance and Human Resource Development. *European Journal of Sustainable Development*, 8(5), p. 16.

[12] Jianu, I., Dobre, I., Bodislav, D. A., Radulescu, C. V., & Burlacu, S. (2019). The implications of institutional specificities on the income inequalities drivers in European Union. *Economic Computation and Economic Cybernetics Studies and Research*, 53(2), pp. 59-76.

[13] Bran, F., Alpopi, C., & Burlacu, S. (2018). Territorial Development-Disparities between the Developed and the least Developed Areas of Romania. *LUMEN Proceedings*, 6(1), pp. 146-155.

[14] Burlacu, S., Enache, A. C., & Stefan, C. (2013). INcreator-Innovative software tool for creation of adaptive education digital content. In *The International Scientific Conference eLearning and Software for Education*, 2, p. 238. "Carol I" National Defence University.

[15] Burlacu, S., Grigorescu, S. D., Stefan, C., & Popescu, C. (2013). Basics of design and testing of a digital content generator tool for e-learning. In *2013 8th international symposium on advanced topics in electrical engineering (ATEE)*, pp. 1-4. IEEE.

[16] Burlacu, S., Rădulescu, C. V., & Bălu, O. F. (2018). Forms of Electronic Training. Principles of Educational Games. In *Proceedings of the International Conference on Economics and Social Sciences*, 1, pp. 36-41. Bucharest University of Economic Studies, Romania.

[17] Burlacu, S., Jiroveanu, D. C. (2009) IT governance and educational ideal, *Administratie și Management Public*, 13, 73-82.

[18] Costache, G., Marinas, C. V., Igret, R., & Burlacu, S. (2015). Internship in the Hr Department – Organizational and Individual Perspectives. In *Proceedings of the International Management Conference*, 9(1), pp. 359-370. Faculty of Management, Academy of Economic Studies, Bucharest, Romania.

[19] Dubois, J.-M., & Rousset, P. (2017). Adapting skills: a challenge digital companies have to meet. *Training* & *Employment*, N°131, September-October 2017.

[20] European Council (2015). *2015 Joint Report of the Council and the Commission on the implementation of the strategic framework for European cooperation in education and training (ET 2020) - New priorities for European cooperation in education and training.*

[21] Eurostat (2019).

[22] Ionita, F., & Burlacu, S. (2009). Public Administration from Romania in the Knowledge Society and E-Learning. In *Proceedings of the Fifth Administration and Public Management International Conference: Public Institutions' Capacity to Implement the Administrative Reform Process"*, Bucharest, June 23-24, No. 25.

[23] Milovanovitch, M., Badescu, M., & Prina, M. (2018). *Reforms in Vocational Education and Training in ETF Partner Countries*, European Training Foundation.

[24] Organization for Economic Cooperation and Development (2019). *Trends Shaping Education 2019*, OECD Publishing, Paris.

[25] Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2018). Demographic explosion and it governance in public institutions. *Managerial Challenges of the Contemporary Society. Proceedings*, 11(1), 18.

[26] Stoica, M. M., & Burlacu, S. (2017) Concepts and trends on e-learning in Romania. *The International Journal of Engineering and Science (IJES*), 6(3), pp. 100-105, ISSN (e): 2319-1813 ISSN (p): 2319-1805.

[27] United Nations (2019). *Quality Education.*

[28] Wurzburg, G. (2010). Making Reform Happen in Education, in *Making Reform Happen: Lessons from OECD Countries*, OECD Publishing, Paris.

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Skill Needs in Romania in the Context of Technological Change

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Abstract

This paper presents the results of an analysis of skill needs in Romania, using available statistical datasets from main statistical institutions. Romania faces high rates of unemployment, and employers report skills shortages limiting firms' growth. Using data from major statistical institutions, we aim at shedding light on the type of skill needs of the economy, especially in the context of technological change, and at providing insights into labour market dynamics and employers' needs, especially in terms of technological diffusion. A rigorous descriptive analysis of the characteristics of skill needs in Romania is implemented. The findings show that Romania was confronted with a labour market crisis before the Covid pandemic, and the ITC sector suffered the most, as it was confronted with some of the highest skills shortages in Romania. Whereas Romanians have the least digital skills in Europe, socio-emotional and digital skills are the most demanded skills across all industries and occupations. Granular analysis of skills demanded by sector is conducted, with an accent on ICT, and useful to policy makers to inform training needs and career information provided.

Keywords: skill needs, ICT sector, Romania, statistical analysis.

JEL Classification: J24, J23, J44

1. Introduction

During the last years, the Romanian economy experienced relatively high growth rates that allowed it to converge to the overall economic development in the EU. Romania's real GDP growth averaged 4.5 percent per year, more than double than the average in the EU-28 during the same period. Romania's

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population continued to diminish, and with it, the available workforce. Over the last years, employment has become progressively intense in services, despite the growth of employment in industry. The industry became a significant job creator, but its structure changed: the textile and *lohn* industry declined, while the auto-moto and vehicles industry increased. New types of businesses and public and private services emerged and developed. Economic growth concentrated more of the workforce into higher value-added activities, and away from agriculture, which was for a long period a safety net for households. Looking forward, the technology is about to influence the nature of jobs in some specific industries (Acemoglu and Autor, 2011; Autor, 2015), and the task content of certain occupations globally. Low fertility, complemented by the out-migration of almost 3.5 million Romanians living abroad in 2018, has resulted in negative population and labour force growth. Considering this, according to the National Bank of Romania, unavailability of skilled staff and lack of skilled personnel is regarded as a significant barrier to development for firms at the national level (NBR, 2017).

In this analysis we focus on Romania, which is one of the fast-growing economies in the EU and aim to showcase in-depth all challenges and developments shown above, considering the need for skills in the ICT sector. Whereas it is well known that the competitiveness of Romania will depend on its capacity to adapt to the technological changes considering the Fourth Industrial Revolution, the understanding of the skill needs in the economy is of paramount importance for informing future analysis in the field, as well as future public policies.

2. Problem Statement

The impact of technology is becoming increasingly complex, focusing on the debate regarding the effect of technological changes on the future of labour, employment and skills. The initial studies have estimated negative effects that could vary from 57% for the jobs in OECD countries, 73% for the jobs in Asia, to 85% for the jobs in Ethiopia (Frey and Rahbari, 2016). Brynjolfsson and McAfee (Brynjolfsson and McAfee, 2014) considered technological change and innovation to be the main causes of unemployment. Subsequently, researches focused on the innovation-employment relationship and the qualitative impact on the labour force competences (Autor et al., 1998; Chennells and van Reenen, 1999).

These findings have been partially rejected by recent studies that estimate moderate effects. Arntz, Gregory and Zierahn (Arntz et al., 2004) estimate the impact of automation on US jobs and note that only 9% of jobs are exposed to the risk of automation.

Structural analysis of job changes in 12 Asian economies by ADB (Asian Development Bank, 2018) suggests that the effects of income growth on demand outweigh the negative impact of technology, which leads to the positive net growth in employment and can help generate jobs in other industries. Other studies (Autor and Salomons, 2017; MGI, 2017) show that if increased productivity generated

by technology has the effect of reducing employment within an industry, this increase generates employment in other sectors and industries.

More recently, some studies have analysed the effect of the gap in technology adoption, showing that technology adoption is determined not only by technological aspects but also by economic efficiency. The technology will not be produced as it is financially more profitable (Asian Development Bank, 2018). Other studies in the field analyse the effects that technology will have on work. New jobs will require higher cognitive and soft skills, and will mainly involve cognitive and non-repetitive activities, especially in the field of services (PwC, 2019). In fact, it was found that the demand for jobs that require non-routine cognitive tasks such as researchers or managers has grown faster than jobs that require routine manual tasks such as line assemblers (Asian Development Bank, 2018).

Also, studies show that emerging new jobs will increasingly require higher-level skills (Frey and Osborne, 2013; Khatiwada and Veloso, 2019) and suggest that the risk of automation is higher in jobs with low salaries and low skills. Thus, it is necessary to prepare the current and future workforce adequately for the transition to highly qualified jobs.

3. Aims of the Research

The main purpose of this research is to highlight the type of skill needs in the economy, especially in the context of technological change, and to provide insights into Romanian labour market dynamics and employer needs, especially in terms of technological diffusion. The main hypothesis of the analysis is based starting from the prevalent opinion crystallized over the past years in the field that unless rapid structural reform measures are adopted, the technological change will widen the digital gap between the poorer and less educated and the richer and more educated consequently, and between the rural and the urban parts of the country. Considering that workforce reskilling and upskilling has the potential to diminish this gap and to smoothen the transition of Romania to the Fourth Industrial Revolution, the current analysis aims to outline the current state of play regarding the demand for skills, especially in the ICT sector, by using existing quantitative and qualitative data. In order to do so, the analysis tries to answer to the following research questions:

1. What jobs and skills are going to be in demand in Romania in the medium term?
2. How is the ICT sector evolving in Romania?
3. What is the digital skill level of the Romanian labour force?

4. Research Methods

Using macro data from major statistical institutions (mainly Eurostat and the National Institute for Statistics, but also the National Bank of Romania), we aim at shedding light on the type of skill needs in the economy, especially in the context of technological change, and at providing insights into labour market dynamics and

employer needs, especially in terms of technological diffusion. A rigorous descriptive analysis of the characteristics of skill needs in Romania is implemented.

5. Findings

The demand for skills in Romania was influenced by various factors, ranging from the brain drains to weak correlation between education outcomes and labour market needs. High rates of inactivity recorded by the working-age population (15-64), especially by vulnerable groups and women, lack of correlation between education and labour market needs, high levels of early school living and the lowest participation in lifelong learning in the EU (Eurostat, 2019), important brain drains (World Bank, 2018), all shape the skills panorama in Romania, contextualizing the skill demand and skill mismatch on the labour market. Other contributing factors are low public spending on active labour market measures and lack of transparency regarding recruitment in public authorities and state-owned companies, as jobs openings are not advertised in PES matching services.

Skills shortages are major barriers in firms' operating environment, hampering corporate investment activity and increasing investment gaps, as finding a qualified workforce is among the top five concerns for Romanian firms (EIB, 2019). Unavailability of skilled staff was regarded as a major barrier to development by 42 percent of non-financial corporations in Romania, while lack of skilled personnel affected especially larger firms (60 percent) and small and medium enterprises (42 percent percent). At a sectoral level, skill shortages affected to a larger degree companies from the industrial sector (51 percent), while companies in services and agricultural sectors were influenced to a lesser extent (40 percent) (NBR, 2019).

5.1. Skills in demand in Romania

There is a consensus on the skill problems facing Romania. Policy documents like the National Strategy for Employment 2014–2020, the National VET strategy 2016-2020, Lifelong learning strategy 2015-2020, Strategy for tertiary education, Strategy for the modernization of educational infrastructure draw attention on the risks associated with the lack of skills or skills uncorrelated with labour market requirements, for the implementation of economic growth strategies.

Romania was confronted with a major skilled labour force crisis before the Covid-19 pandemic. Skills were not evolving in line with the needs of expanding economic sectors, as 81 percent of employers declared having difficulties filling job vacancies. The labour market relevance of vocational education and training outcomes is still limited. Some steps have been taken to recognize learning outside formal education and training and to steer the new dual vocational education and training, yet pressing challenges remain. Other important barriers are: (i) the limited offer of non-formal education and training; (ii) limited participation in vocational qualification programmes for people with a low level of qualifications;

(iii) insufficient coordination between stakeholders; and (iv) insufficient system monitoring, quality assurance and staff training (COM, 2019a).

Skilled workers and administrative officials were highly demanded on the labour market. As it can be noticed from the table below, the lowest demand for labour force was registered in the agricultural field. The vacancies analysis provides an understanding of sectors with higher requests and an indicator of particular skills required in the near future. A response to this issue can be increased participation in education and vocational training and lifelong learning, with special emphasis on digital skills.

Unfortunately, Romania has the lowest participation rate in lifelong learning in the EU, because of attitudinal and systemic problems (Figure 1). As it can be noticed, there is a prevalent self-sufficiency mentality (especially at the level of people at risk on labour market, aged over 40), who believe that their level of skills is perfectly matched to their job description), and that continuous education and training plays little role in job promotion and fulfilling the job description tasks (Balica et al., 2010). Moreover, the LLL system is not adapted to employers' needs generating quality and relevance problems as the education outcomes are not relevant for the labour market needs (MEC, 2015). As noticed in the graphs below, participation to life-long learning is very low, as this is generally not compensated in wages or career progress or valued at the personal level. In the case of ICT skills, in 2018, only 5 percent of the Romanian employers provided training opportunities to their employees, compared to 23% in the EU.

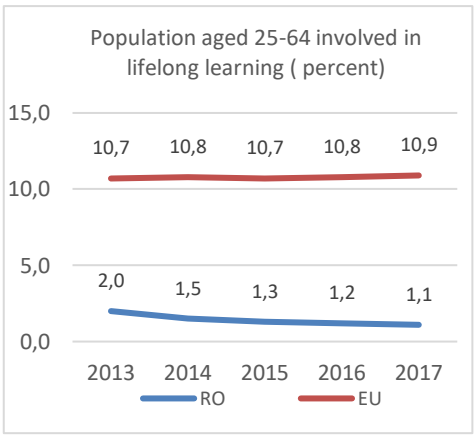

Figure 1. Lifelong learning, 2013-2017
Source: Own computations based on Eurostat data

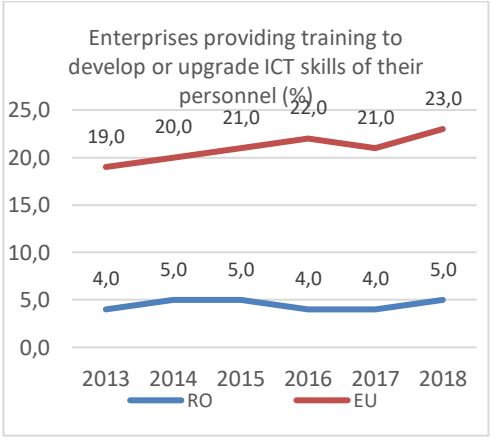

Figure 2. Enterprises providing ICT training, 2013-2018
Source: Own computations based on Eurostat data

5.2 ICT sector in Romania and digital performance

Changes in the occupational structure of the Romanian labour market reflect how it is impacted by demand, and what types of skills are needed. The most significant change is in the ICT sector in Romania which is one of the most dynamic sectors in the country, developing progressively over the past years. This is also a reflection of the trend that the longer-term structural shift is towards a service-orientated economy. The number of companies active in the information and communication sector in Romania grew significantly over the last ten years from 26,482 enterprises in 2011 to 37,254 enterprises in 2017 (Eurostat, 2020). In the context of economic growth, the business evolved in the same rhythm from RON 26 billion in 2010 to RON 51.1 billion in 2018. By far, the ICT sector becomes a high contributing sector to Romania's GDP (5.5% in 2017) (NBR, 2017), with almost 150,000 people employed. Still, according to the EC, in 2017, Romania had the lowest share of ICT specialists in total employment (2.1%). Considering the existing vacancies in the ICT sector, the situation suggests that the gap between demand and supply might be widening, and that the potential of people with ICT skills might remain unexploited.

Whereas the ICT sector is thriving, Romania's digital performance lags. According to DESI (COM, 2019b), Romania is on the last places in Europe accompanied by Bulgaria.

Industry 4.0., digital transformation and innovation are at the heart of the EU's future development for the next 10 years. Industry 4.0., combining communication networks, automation, robots, 3D printing, AI, control systems and automated cars, will significantly impact on the economy, leading to an unprecedented level of automation and operational independence. Technology may replace some jobs, but can also continue to enable job growth. Information and communication technology made possible the spectacular growth of the ICT sector in Romania, which is now confronted with important labour and skills shortages due to the incapacity of the education system to generate a skilled workforce (COM, 2019b).

Advances in robot technology and artificial intelligence have stoked global fears that many jobs may disappear, and different studies (Frames, 2019; PwC, 2019) point to the fact that Romania, as East European Country, shares one of the highest risks of automation replacement in the EU (more than 60 percent). According to the International Federation of Robotics, Romania currently has 11 robots at 10,000 industrial workers. By comparison, in Poland there are 28 robots/10,000 employees, and in Hungary 57 robots/10,000 employees.

Considering the higher job vulnerability of routine tasks (Frey and Osborne, 2013; Nedelkoska and Quintini, 2018), these transformations are considered to affect production lines in manufacturing sector, but also higher-skill professions such as journalism, accounting, tax and management consultancy, legal and other advisory, eventually even education (COM, 2016). Other opportunities will emerge especially in knowledge-intensive sectors, leading to additional labour re-allocation and employment growth in other sectors. Skill mismatches and re-skilling and

up-skilling represent significant barriers to the transfer of workforce across and within sectors (Ryder et al., 2015; UNDP, 2015).

5.3 The demand for digital skills in Romania

According to the European Commission, 90% of jobs need a minimum level of digital competences, and the need for ICT specialists is on the rise (CEDEFOP 2019).

Demand for ICT skills is expected to grow, as ICT labour shortages will increase because the ICT sectors and the digital sector are expected to raise in the next years. Brain drain, outdated teaching methods, outdated learning curricula and low levels of non-cognitive skills contribute to the ICT labour shortage and skill mismatch phenomena (CEDEFOP, 2016). There has been slow progress over the past years, especially in digital skills and the digitization of the economy. The gap between Romania and the EU in terms of skill mismatch, development and skill activation is significant (Figure 3). Also, ICT skill gaps are quite significant, as Romania ranks last place in the EU regarding the individual skills index, computer skills and internet skills (EUROSTAT, 2017). Only 2 percent of employed individuals are working as ICT specialists. Whereas the number of STEM students has doubled over the past few years, the number of teachers has remained the same. There is a significant mismatch between what the market requires and what universities are delivering. Only about 20 percent of the market needs are currently covered, and the provision of ICT training at the firm level remains low (COM, 2019a). Furthermore, even though Romanians are benefiting from ultrafast broadband, broadband networks are underdeveloped in rural areas, with the risk of digital exclusion.

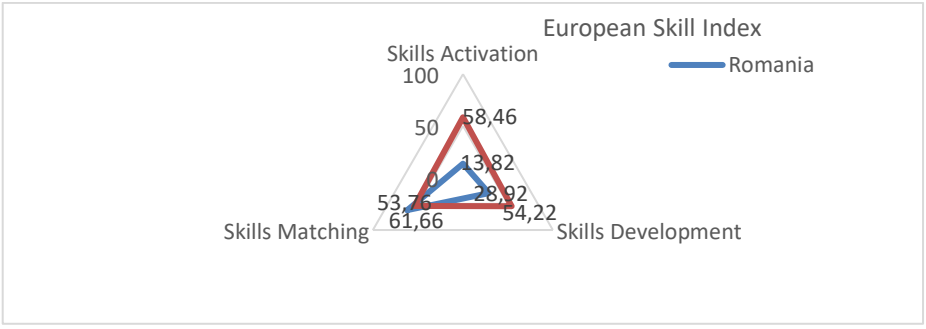

Figure 3. Romania: Skills Panorama Index
Source: CEDEFOP, Skills Panorama Index, 2016

Lack of adequate soft skills is another cause of skilled workforce deficit, as soft skills are taught neither in the education system, nor in the vocational or training system. Soft skills in high demand are interpersonal abilities and communication abilities, such as lack of professionalism, collaboration and weak team work abilities, and problems related to attention to details, planning and organization.

6. Conclusions

As technology is the main driver of change in the labour market, a skill-based, rather than a degree-based labour market (World Economic Forum, 2019), accompanied by a digitalized labour force should be Romania's focus for the next 10 years. Romania's transition to a higher value-added economy, against the background of exponential technological change, current skills shortages, limited skill anticipation/forecasting capacities can be achieved only by permanently upgrading the skills of employees and by strengthening the vocational education and training system in line with the fast-changing needs in the economy. The desired progress cannot be achieved without a digitalized and adaptive workforce. Therefore, ICT skill training should become a compulsory part of every training curriculum.

The paper also shows that statistical data appears to be a useful complement to more traditional sources of information to study in "real-time" skill dynamics and employer needs. In the future, a more specific analysis of the impact of technology on skill needs in Romania should be conducted at the content level, by intercrossing the current occupation and skill registers at the international and national level, considering the shift from routine to non-routine cognitive jobs.

References

[1] Acemoglu, D., Autor, D. (2011). Skills, Tasks and Technologies: Implications for Employment and Earnings, In: *Handbook of Labor Economics. Elsevier*, pp. 1043-1171. https://doi.org/10.1016/S0169-7218(11)02410-5.

[2] Arntz, M., Gregory, T., Zierahn, U. (2004). Benefit Coverage Rates and Household Typologies: Scope and Limitations of Tax-Benefit Indicators (OECD Social, Employment and Migration Working Papers No. 20). https://doi.org/10.1787/08103 6000058.

[3] Asian Development Bank (Ed.) (2018). How technology affects jobs, Asian development outlook. Asian Development Bank, Metro Manila, Philippines.

[4] Autor, D. H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. J. Econ. Perspect. 29, pp. 3-30. https://doi.org/10.1257/jep. 29.3.3.

[5] Autor, D. H., Katz, L. F., Krueger, A. B. (1998). Computing Inequality: Have Computers Changed the Labor Market? *Q. J. Econ.*, 113, pp. 1169-1213. https://doi.org/10.1162/ 003355398555874.

[6] Autor, D. H., Salomons, A. (2017). Does productivity growth threaten employment?.

[7] Balica, M., Bîrzea, C., Fartusnic, C., Horga, I., Jigau, M., Tufă, L., Voicu, B., Achimescu, V. (2010). Survey on the participation in the continuous training of employees at risk on the labour market.

[8] Brynjolfsson, E., McAfee, A. (2014). The second machine age: Work, progress, and prosperity in a time of brilliant technologies., The second machine age: Work, progress, and prosperity in a time of brilliant technologies. W W Norton & Co, New York, NY, US.

[9] Cedefop (2016). Romania: VET in Europe: country report. European Centre for the Development of Vocational Training.

[10] Chennells, L., van Reenen, J. N. (1999). Has technology hurt less skilled workers? A survey of the micro-econometric evidence. Institute for Fiscal Studies.

[11] COM (2019a). Country Report Romania. European Commission.

[12] COM (2019b). Digital Economy and Society Index. European Commission.

[13] COM (2016). Key economic, employment and social trends behind a European Pillar of Social Rights. European Commission.

[14] EIB (2019). Investment: What holds Romanian firms back? (Working Papers). European Investment Bank.

[15] Eurostat (2019). 11.1 % of adults participate in lifelong learning.

[16] Frames (2019). Factory 4.0. How new technologies influences the Romanian economy?.

[17] Frey, C. B., Osborne, M. A. (2013). The future of employment: How susceptible are jobs to computerisation? Technol. Forecast. Soc. Change.

[18] Frey, C. B., Rahbari, E. (2016). Do labor-saving technologies spell the death of jobs in the developing world?.

[19] Khatiwada, S., Veloso, M. K. M. (2019). New Technology and Emerging Occupations: Evidence from Asia. Asean Development Bank.

[20] MEC (2015). Lifelong learning Strategy 2015-2020.

[21] MGI (2017). Jobs lost, jobs gained: Workforce transitions in a time of automation. McKinsey Global Institute, New York.

[22] NBR (2019). Survey on the access to finance of non-financial corporations in Romania. National bank of Romania.

[23] NBR (2017). Studiu al evoluțiilor sectorului IT & C în România. National Bank of Romania.

[24] Nedelkoska, L., Quintini, G. (2018). Automation, skills use and training. https://doi.org/10.1787/2e2f4eea-en.

[25] PwC (2019). Will robots really steal our jobs? An international analysis of the potential long-term impact of automation. PricewaterhouseCoopers.

[26] Ryder, G. (2015). International Labour Office, International Labour Conference (Eds.). The future of work centenary initiative: report of the Director-General: report I.

[27] UNDP (2015). (Ed.) Work for human development, Human development report. United Nations Development Programme, New York, NY.

[28] World Bank (2018). Migration and remittances.

[29] World Economic Forum (2019). Strategies for the new economy. Skills as the Currency of the Labor Market.

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Management of Water Resources at Global Level

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Abstract

The significance of the role of water in the life of the Earth can be fully understood only by analysing the contribution that water has in supporting environmental systems and in supporting human society. The two aspects are interdependent, but sometimes sudden decisions are made about one of them without taking into account the possible effects on the other, as when a city withdraws water from a river without considering the consequences on fish life, or when drainage of wetlands reduces the quality and quantity of water used in urban areas. There is a permanent demand to consider and evaluate the two issues together, starting from speculation about the possible impact of global warming on water supply to one extreme of generalization, to estimates of the essential daily needs of one isolated family at the other end. The purpose of this article is to present both the complex issues of water resources management and possible solutions to solve specific situations. The main research method was the documentary analysis doubled by a realistic debate of the problems from the perspective of economists and environmental specialists. The findings have led us to highlight some of the solutions that, of course, open new approaches and debates that we will consider in future research. These are also the main limits of our research.

Keywords: management, water, globalization, lakes, natural water.

JEL Classification: Q25, Q53

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1. Introduction

The importance of water at a global scale can be perceived by examining the totality of water on Earth, how the basic concepts of the role of water in global life have evolved, how they have been at certain times in harmony or conflict, and how they are presented in miniature as well as on overall scale (Bran et al., 2018). The evolution of thought has been sporadic and has been modestly carried out since the appearance of the monumental 1864 study "Man and Nature; or Physical Geography Modified by Human Activity" (Marsh, 1864), in order to draw attention on the various ways in which the population of the world has changed the environment over time (Angheluta et al, 2019). That examination was renewed a century later by the symposium on "The Role of Man in Changing the Face of the Earth", organized on the basis of general themes about the past, present and future (Thomas, 1959).

Regarding the approaches of human perception on the changes of ecosystems, great attention is paid to the way in which societies from different regions and time periods are interested in the knowledge of the environment, as well as the role played by changing perceptions, attitudes, social movements and scientific processes (Burlacu et al., 2018).

2. Background

In 1996, the Global Water Partnership (GWP) was founded, an international network open to all organizations involved in water resources management: government institutions in developed and developing countries, United Nations agencies, bi- and multilateral development banks, non-governmental organizations and private sector organizations. GWP was created to stimulate Integrated Water Resources Management (IWRM), which seeks to ensure the coordinated development and management of water, land and adjacent resources, to strengthen social and economic well-being without compromising the sustainability of vital environmental systems.

The Stockholm GWP Secretariat has begun distributing documents created and mandated by the TAC to form conceptual plans. These documents contain general topics, as well as those subordinated to them, such as the understanding and definition of IWRM, the water needed to provide food, partnerships between the public and private sectors, water seen as an economic good. According to these documents, the concept of IWRM attracted particular attention after the international conferences on water and environment held in Dublin and Rio de Janeiro after 1992. The general principles, approaches and guidelines relevant to the IWRM are numerous and each has its own appropriate field or areas of application.

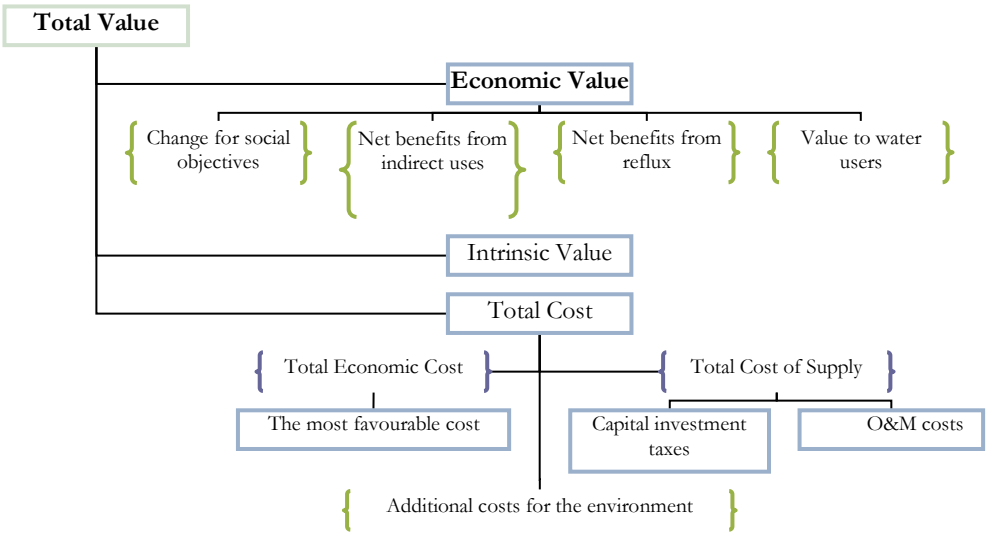

Figure 1. General principles of water assessment
Source: Adaptation from Global Water Partnership documents

The total value of water consists of the use value or the economic value and the intrinsic value (Figure 1). The economic value that depends on the water user or the way water is used includes: the value to users (direct water), the net benefits of water used in other products or processes and returned, through evapotranspiration or other leaks (e.g., reflux water) and the contribution of water to achieving social objectives. Intrinsic value includes non-use values as inherited or existing values.

The Dublin Principles are a particular set that also formed the basis of the IWRM.

The four principles of the Dublin conference are:

1. Fresh water is an exhaustible and vulnerable resource; it supports life, development and the environment.
2. Water development and management must be based on the principle of participation, involving consumers, planners and policy makers at all levels.
3. The woman plays a central role in supply, management and water security.
4. Water has an economic value in all uses in which it is involved and this must be recognized as an economic good.

Within the IWRM, the following concepts of water value were considered useful.

3. Problem Statement

Water and Dry Deficiency: a European Problem?

Water scarcity is a global problem. In underdeveloped countries, water is a limiting factor of agricultural production and implicitly of food. In these countries, population growth, water consumption, declining groundwater reserves in semi-

arid areas as a result of climate change, as well as water pollution are a challenge to ensure sufficient water reserves (Teutsch & Krueger 2010 apud Water CoRe, 2020). Thus, it is found that all over the world a series of conflicts arise from the decrease of water reserves, the desertification of some regions, the obtention of poor agricultural harvests, as well as the decrease in fresh water resources.

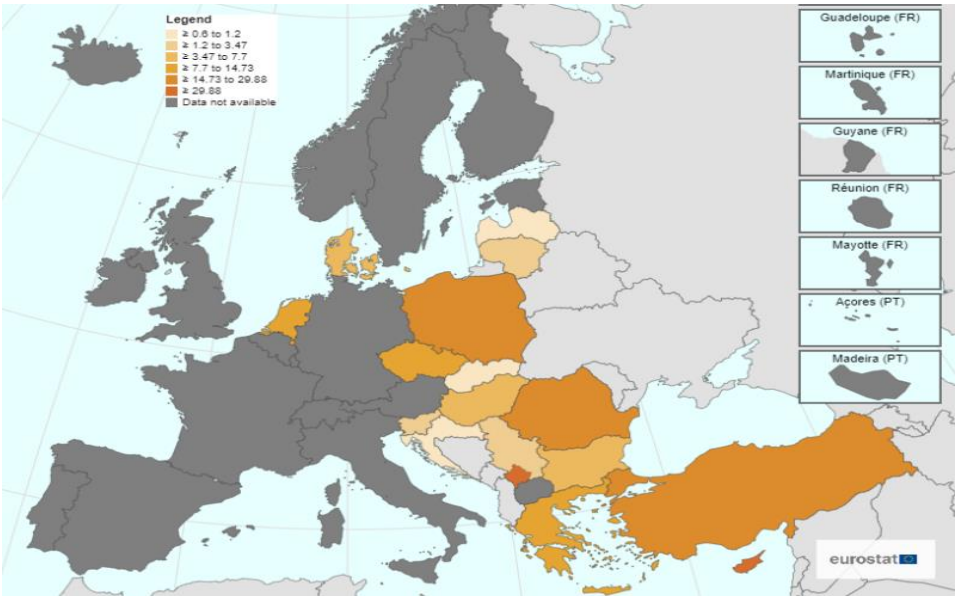

Figure 2. Water exploitation index, 2018, unit of measure: percentage
Source: https://ec.europa.eu/eurostat

The indicator shown in the figure above can be interpreted as follows:

1. it presents the total annual amount of fresh water extracted in a country, as a percentage of the annual average amount of water available from renewable fresh water resources;
2. it means the total annual groundwater abstraction expressed as a percentage of the annual average amount of groundwater in the country available for capture; and
3. it expressed the total annual amount of surface water extracted as a percentage of the average annual surface water resources available in the country for extraction.

By analysing the map of the water exploitation index (Figure 2), it results that not only the countries located in the south of Europe, but also some regions of Central and Western Europe face problems of water stress. This is not only caused by climatic conditions, but also by the increasing water demand, especially for the cooling processes in power plants.

3.1 Inventory of Natural Waters

Before analysing the management of water resources and the natural environment, we will describe the natural state of water throughout the Earth before the human alteration of its quality and quantity, although this is only possible in a small extent for a number of reasons (Burlacu et al., 2018). In a simple form, the natural waters on the globe are the sum of atmospheric humidity, precipitations, soil and depth stocks, icebergs and glaciers, oceans and moisture deposited or transposed by plants and animals (Radulescu et al., 2018).

Numerous international scientific efforts are being made to analyse the significant changes in climate, hydrology and elements related to the environment system (Negescu Oancea et al., 2019). These include the International Geosphere and Biosphere Programme (Lohmann, 2002) as well as the Intergovernmental Climate Change Organization (IPCC Intergovernmental Climate Change Organization). According to this increasingly supported theory, water resources can change significantly (Bodislav et al, 2019).

Water resources on any scale are the subject of a variety of administrative measures, and natural waters can be considered water resources outside of human intervention that alter their quality and quantity (Bran et al., 2018). Human actions have altered the initial distribution and quality of rainfall, rivers, deep water in various ways, and continue to do so (Alpopi et al, 2018). These actions not only include the direct handling of quantities within the hydrological circuit by diverting precipitation and rivers, by retaining water, altering evaporation, but also by changing the quality of air, water and soil (Dima et al, 2020).

3.2 The Deep Waters

Depth or groundwater is the continental water that accumulates in the upper part of the earth's crust, inside the rock layers. The groundwater layer is called the aquifer; the flow and the level being influenced by the climatic conditions (precipitation regime, temperature), but also by the degree of its use by the man, for domestic and industrial consumption (Ionita et al., 2009). These groundwater formations differ from place to place. Overall, groundwater is an important source of fresh water worldwide, being used in various ways through springs or wells, through a variety of technologies.

A hydrological study estimates that approximately 29% of the world's freshwater reserves are stored in the aquifer at any given time. About 33% of that volume is on the Asian continent, 23% in Africa, 18% in North America, 13% in South America, 6% in Europe and 5% in Australia (Aladin, 2002).

Globally, the actual extraction of deep water is affected by the use of groundwater and surface water, and the particular purpose for which it is used. In areas where extraction exceeds both natural and artificial recharge, aquifers have decreased significantly, and in some areas, they have been largely or completely depleted.

Because scientific studies on deep water are generally less extensive than research on other aspects of the hydrological cycle, understanding the effects of water management is difficult in many places. Estimating the quantity and quality of water from an underground formation differs greatly in accuracy from one place to another.

3.2.1 The Deep Waters in Europe

Deep water is a major source of drinking water throughout the European continent, so the status of the deep water in terms of quality and quantity is of great importance. Furthermore, deep water plays an important role in the environment − for both aquatic and terrestrial ecosystems. Human interventions in the hydrological cycle can have profound effects on the quality and quantity of deep water. It is necessary to identify the most important interventions on aquifers in order to understand the interrelationships between the intervention and the related side effects. Also, it is necessary to investigate the underlying causes and the measure of human intervention on the hydrological cycle in order to establish the appropriate management and planning measures.

The Environmental Assessment Report, prepared by the European Centre for Inland Waters, presents a summary of the most important problems related to the quality and quantity of the depth water, materialized in maps and other geographical applications. The report is based on the important indicators of the depth water quality: nitrate, pesticides, chlorite, alkalinity, pH value and electrical conductivity (Scheidleder et al., 1999).

The conclusions of this report showed that the application of nitrogen fertilizers is a pressure for the quality of the deep water. The commercial use of nitrogen fertilizers and the use related to the agricultural area have increased in most western European countries since 1992. Pesticides also have an impact on Europe's deep water.

In some regions, the depth of deep-water extraction exceeds the refuelling (over-exploitation) rate, but in most European countries the annual deep-water extraction has decreased since 1990. Extraction is one of the causes of deep-water exploitation, the intrusion of salt water and the endangerment of wetlands.

The quality and quantity of Europe's fresh and deep-water resources are influenced and in some cases are at risk due to the numerous human activities.

In northern Europe (Iceland, Norway and Sweden), nitrate concentrations are low, and at the country level, the scale of the Drinking Water Directive indicating 25 mg NO_3/l is exceeded in more than 25% of the investigated sites in 8 of the 17 countries that provided information. In the Republic of Moldova, approximately 35% of the sampled areas exceed the maximum allowed concentration of 50 mg NO_3/l.

Deep water pollution with heavy metals has been reported in 12 of the countries studied by the European Centre for Continental Waters, the contamination occurring through infiltration of waste areas, from mining activities as well as from industrial sources.

Many of the human pressures on deep water are widespread across the continent, so some issues regarding the quality and quantity of deep water can be addressed and resolved at European level. In general, the larger the geographical unit affected by the decisions, the greater will be the level of accumulation of the necessary information. Moreover, the larger the geographical area, the more likely it is that the database will be incomplete and heterogeneous, especially if more countries are involved. National monitoring systems are designed to provide information tailored to the domestic needs of certain countries. As a result, different countries often apply different monitoring strategies and methods.

There are a number of current European Union Directives addressing the management and protection of deep water in the European Union. These include the Deep-Water Directive (80/68/EEC) and the Nitrate Directive (91/676/EEC), followed by the Plant Protection Products Directive (91/414/EEC), which controls the use of substances that can cause side effects to deep water. However, the success of the Nitrate Directive depends on the degree to which the farmers cooperate, as the rules are difficult to apply. In the Netherlands, for example, the whole country has been designated a nitrate-sensitive area, an action plan has been developed and a Code of Good Agriculture Practice has been developed, but at the other end of the spectrum, Ireland does not intend to designate a Nitrate Vulnerability Zone.

Regarding the quality of the deep water, the report concludes that the main problems in Romania are related to the intensive contamination of aquifers with organic substances, such as ammonia and especially bacteria.

3.3 Lakes Management

Public and private agencies can exercise a variety of measures for the quality management of lake ecosystem, including controlling the amount of inflow and water leakage; measures that address the problem of eutrophication; control of pollution with toxic substances; management of organic life; sedimentation control, as well as planning of the use of adjacent land.

Regarding the water flow, in the natural lakes the quality of the water and the life of the lake can be greatly influenced by the quantity and synchronization of the control of the water inflow, the drainage of the water and the circulation within the lake.

To prevent the phenomenon of eutrophication (Annex 14 shows the European situation of this problem), the Report of the European Environment Agency on natural and anthropogenic lakes of 1998 presents a series of measures adopted by many European countries, as follows: increase in the treatment of waste water for reducing nutrients from effluents; reduction in the phosphorus used in detergents; control over the application of fertilizers; establishment of the conditions of the future anthropogenic lake for optimizing the choice of its final location (European Environment Agency, 1999).

Regarding the curative methods of the treatment of eutrophication, in the Report of the European Environment Agency are presented some measures applied in the

European lakes: ventilation within the water body, selective withdrawal of the anoxic deep water from the lakes, chemical dosing (with copper sulphate), pre-dam installation, sediment dredging, water entering, water injection, lake discharge management, biomanipulation, water mass destratification, lake layer mixing, and other types of measures.

Regarding the treatment of eutrophication, a common problem is the receipt of a large amount of phosphorus and chlorophyll from the waste treatment plants and from the sources of pollution, while the diversion of waste reduces the concentration of algae and increases the transparency of the water. From the point of view of the control of toxic substances, with the rapid increase in the production of hazardous industrial waste such as pesticides, the danger of persistent toxin accumulation in lake sediments increases.

In terms of land use planning, local regulations in the adjacent areas can have a strong influence on all activities mentioned above and on the quality of the lake environment. The character of the use allowed or encouraged in coastal or shore areas, as well as in the river basin, can have major effects on the quality of water and organisms in lakes.

4. Debates and Solutions

4.1 Management of the Mini and Major White River

The dominant administrative approach to the riverbed involves sophisticated and subtle regulations of natural flow and flood processes from prehistory to the present day. These regulations include transportation on unmodified rivers; hunting, harvesting and fishing in riparian and aquatic habitats; “Flood cultivation” and withdrawal agriculture (planting and cultivation in major wetlands); the recreational, aesthetic and spiritual dimensions of management expressed in images and oral tradition.

These low intensity uses had small impacts on the river channel, a high degree of durability and regulation in the variable flood processes, assuming that they involved a lower resilience to the social pressures of population growth, immigration and conquests, which has led to more intense forms of river basin management.

Environmental impacts of this approach on management include contamination of local water quality and habitat degradation. However, as ports and industrial developments grow in the vicinity of rivers, these environmental consequences could have a regional impact.

4.2 Best Practice Guide

The best practice guide developed within the Water CoRe project under the INTERREG IV Interregional Cooperation Programme states that economic and financial instruments focus on water demand management, through monetary mechanisms, and by applying the instruments, stakeholders can either lead to profit

or loss. Thus, in the guide the technological measures of water demand management were classified into different types and the main solutions obtained by the technological approaches of water demand management were summarized in the following table (Table 1).

Table 1. Solutions obtained by the technological approaches of water demand management

THEMES	TYPES OF SOLUTIONS
Alternative sources of fresh water	Use of sea water for cooling systems
Wastewater recycling	Recycling for various uses
Distribution network efficiency and loss reduction	Location and remedy of losses Pressure reduction
Water consumption reduction equipment	Encourage of the use of water reduction devices Efficient irrigation systems Alternative industrial processes
Accounting	Evaluation of water volumes used Metering and/or measurement of residual/consumption water
Reuse	Use of rainwater for gardening Purification of wastewater for other uses

Source: Adaptation after Water CoRe, 2020

The Water CoRe Good Practice Guide argues that in water demand management, measures are designed so that existing water resources and infrastructure can be improved and also encourage consumers to use water efficiently. This dual approach could bring economic, environmental and social benefits. Knowing that resources are limited, experts say that the solution for sustainable development is based on active management of existing water reserves. According to the definition by the European Environment Agency, sustainable development must seek to balance available water at any time and space with the demand for water used for various "purposes" and with the need for sufficient water to ensure the safety of human health and the aquatic ecosystem. They take all this into account and consider that existing water resources must be of adequate quality to satisfy various consumers, including once again the safety of humans and other living things. It is concluded that the measures can be used in order to increase the accessibility of water resources (e.g., construction of storage basins and control of losses) and/or control and reduction in water demand (e.g., charging for water consumption and metering).

5. Conclusion

In natural systems, relatively unaffected by the human activity, water has at least four main functions and processes that vary in time and space: it nourishes vegetation from soils and rivers; it feeds the entire kingdom of animal organisms,

including fish from rivers and lakes; it removes organic matter or alters it and transports soil or other inorganic materials.

Throughout history, there have been various human interventions on the water cycle in different ways. Initially, water existed and was extracted from natural sources − rivers, lakes, springs − to meet human needs without changing the source, and rivers.

Of the major problems for the future, the same authors mention the following: pollution and overwatering of groundwater resources must be reduced; the quality of domestic water supply in developing countries cannot keep up with the volume of extraction; a large proportion of the world's wetlands have been destroyed along with the reduction of native vegetation and fauna that needs to be restored; water continues to be administered in many sectors by separate and often independent agencies, chemical pollution of both surface and deep water is increasing in many areas.

Regarding the deep water, the Environmental Assessment Report, prepared by the European Centre for Continental Waters, indicates the following information regarding Romania: the average consumption per capita, as well as the specific consumption in industry and agriculture, is higher than in other countries, the explanation being the excessive losses of water from the supply and distribution networks; the way deep water is used has a double negative effect: high specific energy consumption, twice as high as required; the main problems related to the quality of the deep water in Romania are related to the intensive contamination of aquifers with organic substances, such as ammonia and especially bacteria. The most intensive cases of multiple quality impairment were identified in the rural area, due to the lack of the necessary sewage facilities.

References

[1] Aladin, N. (2002). *Criza Mării Aral şi reabilitarea ei* [The Aral Sea crisis and its rehabilitation.] Publicaţia de ştiri ILEC [ILEC News Publication] 40,3.

[2] Allan, T. (1997). *Apa virtuală: O soluţie pe termen lung pentru reducerea apei în economiile Orientului Mijlociu, [Virtual water: A long-term solution for reducing water in the Middle East's economies].* Londra, Şcoala de Studii Orientală şi Africană [Oriental and African School of Studies, London].

[3] Alpopi, C., Burlacu, S., Ioviţu, M. (2018). Procesul de globalizare şi politicile ecologice. In: *Competitivitatea şi Inovarea în Economia Cunoaşterii*, [The process of globalization and environmental policies. In: Competitiveness and Innovation in the Knowledge Economy] 2, 28-29 septembrie 2018, Chişinău, Republica Moldova: Departamentul Editorial-Poligrafic al ASEM, pp. 317-324. ISBN 978-9975-75-931-1.

[4] Angheluta, S. P., Burlacu, S., Diaconu, A., & Curea, C. S. (2019). The Energy from Renewable Sources in the European Union: Achieving the Goals. *European Journal of Sustainable Development*, 8(5), 57.

[5] Arnell, N. (2002). *Hidrologie şi Modificări Globale de Mediu*, [Hydrology and Global Environmental Change], Prentice Hall, Harlow.

[6] Barlow, M. (1999). *Aurul Albastru: Criza Globală a Apei şi Comodificarea Stocurilor Mondiale de Apă*, [Blue Gold: The Global Water Crisis and the Commodification of World Water Stocks], San Francisco.

[7] Biswas, A., Uitto, J. I. (2001). *Dezvoltarea durabilă a Bazinelor Gange-Brahmaputra-Meghna*, [Sustainable development of the Ganges-Brahmaputra-Meghna Basins], Tokyo: Editura ONU.

[8] Bochet, J. (1986). *Managementul Cumpenelor de Ape din Zonele Înalte, [Management of Upland Watersheds]*, FAO Conservation Guide 8, Roma: FAO.

[9] Bodislav, A. D., Rădulescu, C. V., Moise, D., & Burlacu, S. (2019). Environmental Policy in the Romanian Public Sector. *The Bucharest University of Economic Studies Publishing House*, 312.

[10] Bran, F., Alpopi, C., & Burlacu, S. (2018). Territorial Development-Disparities between the Developed and the least Developed Areas of Romania. *LUMEN Proceedings*, 6(1), pp. 146-155.

[11] Burlacu, S., Bodislav, D. A., & Rădulescu, C. V. (2018). E-COMMERCE AND GLOBAL FOOD RESOURCES. *Managerial Challenges of the Contemporary Society. Proceedings*, 11(2), 48.

[12] Burlacu, S., Alpopi, C., Popescu, M. L. (2018). Omul și degradarea mediului natural. Efecte distructive. [The human and the degradation of the natural environment. Destructive effects.], In: *Competitivitatea şi Inovarea în Economia Cunoaşterii*, [In: Competitiveness and Innovation in the Knowledge Economy], 1, 28-29 septembrie 2018, Chișinău, Republica Moldova: Departamentul Editorial-Poligrafic al ASEM, 2018, pp. 159-165. ISBN 978-9975-75-932-8.

[13] Cooke, G. D. et al. (1993). *Restaurarea şi managementul lacurilor naturale şi antropice, [Restoration and Management of Lakes and Reservoirs]*, Ann Arbor, MI : Lewis.

[14] Cosgrove, W. J., Rijsberman, F. R. (2000). *Viziunea asupra Apei Mondiale: Apa devine preocuparea fiecăruia*. [World Water Vision: Making Water Everybody's Business], Pentru Consiliul Apei Mondiale, Londra: Earthscan.

[15] Cunningham, W. P., Saigo, B. W. (2001). *Ştiinţa Mediului: O preocupare globală, [Environmental Science: A Global Concern]*, McGraw-Hill, Boston.

[16] De Bernardi R., Giussani, G. (1995). *Principiile Managementului Lacurilor, [Principles of lake management]*, Shiga, Fundaţia ILEC și Programul ONU asupra Mediului.

[17] Dima, C., Burlacu, S., & Buzoianu, O. A. C. (2020). Strategic Options for the Development of Ecotourism in the Danube Delta in the Context of Globalization. *In SHS Web of Conferences* (74, p. 04005). EDP Sciences.

[18] Fekete, B. M. et al. (2002). *Ciclurile Globale Biochimice*, [Global Biochemical Cycles], 16(3), pp. 1-6.

[19] Forsberg, C. (1987). *Eutrofierea şi restaurarea lacurilor în Suedia: Teorie şi Practică*, [Evaluation of lake restoration in Sweden], Thonon les Bains, Franţa.

[20] Gleick, P. H. (ed.) (2000). *Apa Lumii, 2000-2001: Raportul Bianual asupra Resurselor de Apă Dulce*, [World Water, 2000-2001: Biannual Report on Freshwater Resources], Washington, DC: Editura Island.

[21] Gleick, P. H. (2000). *Apa: Potenţialele Consecinţe ale Variabilităţii şi Schimbării Climei*, [Water: The Potential Consequences of Climate Variability and Change for the Water Resource], Oakland, CA: Institutul Pacific.

[22] Goudie, A. S. (2000). *Impactul Uman asupra Mediului Natural*, [Human Impact on the Natural Environment], (ediţia a 5-a), Blackwell, Oxford.

[23] Ionita, F., Ursacescu, M., & Burlacu, S. (2009). Public Services as Poles of Regional Competitiveness in Sustainable Development. *Revista de Management Comparat International / Review of International Comparative Management*, 10(3), pp. 552-565.

[24] Ioniță, F., Burlacu, S., & Gaidargi, A. (2009). Modern Approaches of the Management of Alternative Trade Systems, *Revista de Management Comparat Internațional / Review of International Comparative Management*, 51, pp. 473-480.

[25] Lohmann, U. (2002). *Interacţiunile dintre aerosolii antropogenici şi circuitul hidrologic, [Impact of Aerosols on the Hydrological Cycle], Programul Internaţional al Geosferei şi Biosferei: Global Change Newsletter* 49, pp. 14-19.

[26] Negescu Oancea, M. D., Burlacu, S., Buzoianu, O. A. C., Mitrita, M., & Diaconu, A. (2019). Strategic Options for The Development of Ecoturism In The Dornelor County. *The USV Annals of Economics and Public Administration*, 19(1 (29)), pp. 21-28.

[27] Radu, I., Sendroiu, C. (2013). The Effects of the Private Public Partnership in the Public Services of Water Supply and Sewerage from the Municipality of Bucharest (Period 2008-2012). University Publishing House, Bucharest.

[28] Radulescu, C. V., Dobrea, R. C., & Burlacu, S. (2018). The Business Management of Distress Situations. *The 12th international management conference "Management Perspectives in the Digital Era"* November 1st-2nd, 2018, Bucharest, Romania, 1, pp. 741-747.

[29] Scheidleder, A. et al. (1999). *Calitatea şi cantitatea apei de adâncime în Europa*, [Ground Water Quality and Quantity in Europe], EEA, Copenhaga.

[30] Thomas, W. L, Jr. (ed.) (1959). *Rolului Omului în Schimbarea Feţei Pământului, [Man's Role in Changing the Face of the Earth]*, Chicago, II: Editura Universităţii Chicago.

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Services Marketing Management in Commercial Companies

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Abstract

In the current period, there is no doubt about the increasing importance of services in the economy of a country, this being one of the most important trends in a modern society. Thus, the service sector now exceeds at least half of modern world economic activities. The importance of the service sector was recognized early in the economic literature. The expansion of marketing in as many fields as from the second half of the 20th century is the result of an economic-social dynamism, which has manifested itself both in terms of the provision and production of services, as well as in the needs, preferences and behaviour of the consumer. The numerous variants of satisfying his needs, make today's consumer more demanding and focused on the value of the products and services offered.

Keywords: management, marketing, commerce, services.

JEL Classification: M11, M31

1. Introduction

If in the pre-industrial stage, the economy was dominated by natural, agricultural activities and everything related to them, a series of changes in the economic life took place with the Industrial Revolution (Bran et al., 2018). These changes were noticed by economists such as Adam Smith, J. B. Say or Colin Clark. Thus, the English economist Adam Smith made a distinction more than two

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centuries ago between the "productive activity" that was materialized in the manufacturing of products and the "non-productive activity" that disappeared when the maximum performance was reached, rarely leaving a strictly economic value behind.

At the beginning of the 19th century, J.B. Say resumed this idea, using the term "services" to describe the intangible and material wealth. In the twentieth century, the first important references to the service sector were made after the great economic crisis when economists like Fisher (1935), Clark (1940), Fourastié (1952) conducted remarkable studies.

While the primary sector mainly refers to activities related to agriculture and mining activities, and the secondary sector includes industrial processing of products from the first sector, the tertiary sector brings together activities related to services (Ionita et al., 2009).

In Romania, the concerns regarding the issue of services marketing are modest. They were more pronounced in practice, especially in the field of marketing research (research conducted by the Institute of Tourism Research and the Institute of Commercial Research). Along the same lines, there are also the efforts made by different companies providing services in the direction of assimilating the marketing optics (Angheluta et al, 2019).

The service market is characterized by the fact that production and consumption processes occur simultaneously and by the fact that the consumer participates directly in the service production process (Grönroos, 2017, p. 219). Given this specificity of the services market, models have been developed that show that service consumption is achieved through a three-stage process: pre-acquisition, interaction and post-interaction (Lovelock and Wirtz, 2011, pp. 36-37).

Consumers can return and make repeated purchases from the same service provider if they feel comfortable consuming a particular service, if their positive expectations are confirmed, or if their negative expectations are denied. If one of these three conditions is met, then the consumer will not only repeat the purchase of the service, but will also become loyal, will recommend the service to others, will positively describe the experience and congratulate the service providers.

On the other hand, if positive expectations about a particular service are refuted, then consumers will rather be tempted to complain to the service provider, make negative recommendations, change the service provider, or make complaints to third parties. (to state authorities, for example) (Tsiotsou and Wirtz, 2015, p. 113).

In the field of services, the 7P model of the marketing mix is often used, a model that includes the following:

(1) Product
(2) People
(3) Price
(4) Place
(5) Physical evidence
(6) Promotion
(7) Processes (Mohammad, 2015, p. 71)

A definition of the term "consumer satisfaction" is given by Hutchinson, Lal and Wang (2009), who view this concept as a positive refutation of expectations, which means that the perceived performance of the service is equal to or better than the expected result. This definition is closely related to the expectation-confirmation theory, which shows that a consumer always has expectations about a certain service, in some cases the expectations being positive, while in other cases the expectations are negative. If a particular service meets consumer expectations, the level of satisfaction is expected to increase and this will have a positive impact on future intentions to purchase the same service (Galib, Hammou and Steiger, 2018, pp. 76-77).

According to the literature, there is an essential factor that determines the degree of consumer satisfaction: the perceived quality of service (Han and Hyun, 2015, p. 20).

There are, in essence, three main effects of high consumer satisfaction: increased trust in the staff who provided the service, increased trust in the company that provided the service, and triggered the intention to make repeated purchases (Han and Hyun, 2015, p. 20).

Due to perceived risk and uncertainty, consumers rarely limit themselves to a single source of information and tend to collect data on the desired service from several sources, chosen on the basis of previous experiences, to which degree the consumer has an innovative spirit, and on the basis of the perceived pleasure of the acquisition experience (Konus, Verhoef and Neslin, 2008, pp. 398-400).

2. Quantitative Analysis

In this paper, the *particulars* of *practical* management pertaining to marketing of services are surveyed, measured and used to determine a more general trend relative to the marketing of services put into practice by (Romanian) commercial companies using data as to the multi-annual activity of the said services company, based in Romania.

The commercial company has the following identification data:
(1) Date of establishment: 2011
(2) City of residence: Bucharest
(7) Working location: Bucharest
(8) Object of activity: Retail.

The data listed above indirectly show that the commercial company represents a small enterprise opened in Bucharest has as main object of activity the sale of products by commercial means. The store opened in Bucharest sells mainly food products, but also tobacco and alcoholic and non-alcoholic beverages and other non-food products.

The current situation of the company can be described in terms of financial indicators such as turnover, profit / loss and average number of employees:

Index	**2017**	**2018**	**2019**
Turnover (RON million)	2.15	1.99	2.34
Annual turnover change	-4%	-8%	18%
Net result	45.931	4.317	-16.245
Net profit margin	2%	0%	0%
Average number of employees	7	7	7

Table 1. Financial status of the Commercial Company
Source: Risco, 2020, p. 1

The data in Table 1 shows a relatively stable financial situation of the commercial company, which had the same average number of employees in each of the years 2017-2019 (seven employees) and an approximately constant turnover, around RON 2 million.

Two other perspectives from which we can make the presentation of the commercial company are the ones that show the company's positioning on the market and its market share. In terms of positioning, it can be said that the commercial company is recognized among its customers as a small neighbourhood store, with affordable prices and a wide range of products available to customers (both food and non-food). From the point of view of market share, it cannot be said that the commercial company holds a favourable position, given that the retail market is dominated by large hypermarket chains such as Kaufland, Carrefour or Metro Cash & Carry - as it can be seen below:

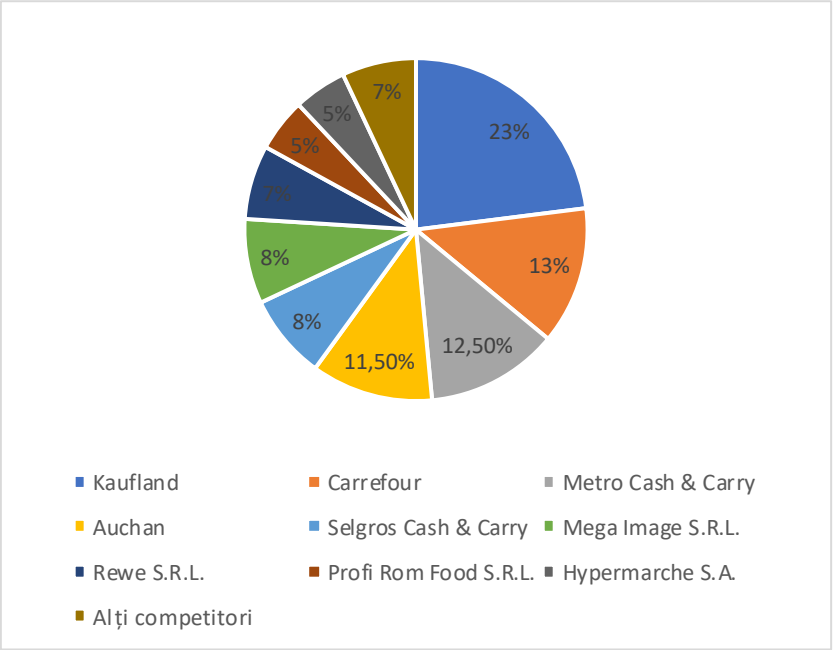

Figure 1. Market shares of the main companies on the Romanian retail market
Source: Mihai, 2016, p. 1

In order to deepen this study, a bivariate analysis was performed which allowed the correlation of satisfaction with the variables reflected in the last questions of the questionnaire, segmentation, age, monthly income, place of residence and studies. For example, in the case of the "product range" variable, an average score of 8.09 was obtained, reflecting on a scale of 1 to 10 a relatively high level of consumer satisfaction. With the help of bivariate analysis, we can deepen the research and highlight whether this relatively high degree of satisfaction is found in all age groups.

In order to perform the bivariate analysis, we associated each of the age categories considered with a numerical value, as follows:

Age	Associated numeric value
18-30 years	1
31-40 years	2
41-50 years	3
51-60 years	4
> 60 years	5

Table 2. Numerical values associated with age segments considered in the study

Based on these data, we can calculate the correlation coefficient that shows the link between the age variable and the variable that reflects company consumer satisfaction with the product range using the following methodology:

Values of X variable (age):

$\sum = 265$

Average = 2.65

$$\sum (X - Mx)^2 = SSx = 202{,}75$$

Values of Y variable (consumer satisfaction with the product range):

$\sum = 809$

Average = 8.09

$$\sum (Y - My)^2 = SSy = 540{,}24$$

Combined value of X and Y variables:

N = 100

$$\sum \frac{(X - My)(Y - Mx)}{\sqrt{(SSx)(SSy)}} = \frac{-201{,}4}{\sqrt{(202{,}75)(540{,}24)}} = -0{,}6085$$

The value of the correlation coefficient of -0.6085 shows that there is an inverse relationship of average intensity between the two variables considered. This means that as the age of respondents increases, the level of satisfaction decreases. In other words, young people tend to be more satisfied with ABC S.R.L.'s product range than older people.

In conclusion, the study conducted to measure consumer satisfaction with regard to the ABC store showed that, in many ways, the customers of this small store are satisfied with the services received. However, there are also exceptions, as a relatively high degree of dissatisfaction was highlighted with regard to some aspects. These issues need to be improved in order to finally achieve a higher degree of consumer satisfaction. Therefore, the recommendations regarding the improvement of services provided by S.C. ABC S.R.L. are the following:

1. Diversification of product range marketed in sweets and canned goods segment, given that customers displayed low(er) degree of satisfaction as to these product categories.
2. Corrective measures to be taken to improve the perception of the ABC store's customers regarding the way managers arrange products on shelves.
3. Practice of a lower surcharge for the products preferred (i.e., most frequently consumed) by store customers.
4. Change of the current logo placed at the entrance to the store.
5. Purchase of more shopping carts and taking the necessary measures for placing them in multiple locations in the ABC store.

3. Design of Services Marketing Management

A specific feature, characteristic of the evolution of marketing in the current period, is its specialization, depending on the profile of the economic activity but also the penetration in social activity fields.

In the field of services, the nature and roles of marketing differs from the field of production of tangible goods, in particular because the products are made before being sold while the services are sold before they are made. Moreover, in the field of services marketing, there is a limit in terms of consumers, which cannot be influenced during the pre-purchase period by different brand policies, promotion, and price, specific to the marketing of goods. Given this, in services a very important role is played by the marketing of after-sales services but also by personal communication in order to win customer loyalty.

In order to provide qualitative services and to make a preference for them, some specific marketing activities must be carried out and marketing strategies used regardless of the organisational structure of the respective company.

Therefore, services marketing requires more than the use of the "4P" in the traditional marketing. The emergence within the mix of elements specific to services leads to the idea that services marketing consists of both internal and external marketing and relational marketing. Internal marketing − Given the importance of the service personnel in the service sector, the successful practice of marketing is conditioned by the efficiency of the internal marketing. This involves investing heavily in the qualities and performances of the employees.

The quality of the services provided depends to a large extent on the efficiency of the staff, on the fact that they must be aware that they form a team whose purpose is customer satisfaction.

Relational marketing − also known as interactive marketing or marketing for existing customers. It takes into account that the way in which the quality of the service is perceived depends very much on the quality of the provider-customer relationship.

Relational marketing involves, in the author's opinion, attracting, developing and maintaining the relationship with the clients, transforming them from mere occasional beneficiaries into loyal clients.

External marketing − takes into account the usual activity of the company, preparing, setting tariffs, distributing and promoting services.

3.1. Services Marketing Complex

In order to build and implement marketing policies and strategies in the field of services, aspects related to the marketing complex must be considered.

The product represents the most important component of the marketing complex in the services field. Given that the goods can be defined in relation to their physical attributes, and in the case of services this is impossible due to the most important feature (the intangibility), the meaning of the three elements that put a mark on the product policy differs.

Due to these particularities, as well as the nature and characteristics of the services, the main activities aimed at the product policy are:

- establishment of the content of the service offer - in most cases, this is constituted by the "global service";
- service quality management - especially due to the generalization of the needs of

the population and the competitive pressure, the most important strategy in this regard is to guarantee a higher quality level;

- differentiation in the service offer − this strategy is very important and together with the provision of quality services, it leads to the net delimitation of the main competitors;
- use of tangible associations − tangible associations (objects, goods, helping promotional materials are very important and contribute in particular to good customer information, an increase in the level of satisfaction and also a differentiation of the company's service offer;
- positioning of services within the package offered - this is done in relation to the importance and quality of the services, the means of achievement being the direct research on a sample of consumers;
- positioning of the company within its competitive environment becomes a mandatory step.

In this sense, the company must know very well its differentiation attributes, permanently hold new information about the competitive environment, to create its own image based on a wide offer, of a higher quality.

The distribution is defined by the totality of the activities by which the material goods are brought from the producer to the consumer. In the field of services, the distribution presents a series of specific aspects determined by the characteristics of intangibility and inseparability of services.

Although most services are performed and consumed simultaneously, there are still services that can make a clear distinction between production and consumption. This leads to the emergence of distribution within the services, its purpose being to make the service more accessible to the consumer.

In the sphere of services, the distribution acquires new values, especially regarding the place of the service and the means by which the service is distributed. In most cases, due to the inseparability of services, the only way of distribution is direct selling, given the difficulty of expanding the geographical area.

The promotion or communication brings together all marketing decisions regarding the messages that the company sends to its audience, regardless of the means used. Due to the nature and characteristics of the services, they are not easy to promote and they customize both the content and the means of promotion used. To substantiate effective promotional strategies, the provider must have information about: the economic-social environment, the competitive environment, its market and mechanisms, the concrete actions carried out in this field by the competing companies and the effects of these actions.

Thus, a series of strategies can be highlighted, as follows:

- depending on the objectives pursued by carrying out the promotional activity, there may be: strategies to promote the image and strategies to expand the image;
- according to the mode of development in time, there are: permanent strategies and strategies with intermittent development;

- given the nature and conditions of the market, the following strategies may exist: offensive (for the purpose of conquering new segments) and defensive (defence);
- depending on the position occupied by the company within the market, one can opt for a concentrated promotional strategy or a differentiated strategy;
- strategies may also consider the use of promotional activities relying on their own or sometimes in collaboration with certain specialized institutions.

The companies will consult the results of the researches before spending money on the advertising campaign, in the desire to choose the appropriate model and to select the best advertising medium. Marketing research can also provide information on personal sales: number of personnel required, payment method, sales zoning, retention of customers, new customers. In the field of services, within the marketing mix, the main role can return to any variable, but the most important aspect is that the marketing mix is not a mere sum of components, but between these components there are important interdependence relationships. The guarantee is a promise from the manufacturer (seller) that the product will work as intended. It can give the buyer the reinsurance he/she needs in order to buy the product. One of the aspects is the nature of the market. If an international trader is present on a market such as the Common Market, where the goods are traded freely within it, a standardized guarantee is desirable. Competition on international markets is another important consideration. For example, the company may not have a guarantee policy developed on the domestic market, but on the international market it may be forced to supervise the guarantee desired by competitors and to adapt it to local conditions.

Conclusions

The transition from the centralized economy to the market economy is one of the most severe challenges of the national economy. In this situation, the marketing activity of the companies becomes more and more significant. Given that interactive marketing also pursues the ability of staff to deliver services to the consumer, the connection between internal marketing and interactive marketing is easily discernible, the latter being inextricably linked to the former.

These oftenly promoted components of marketing, together with the aspects related to the elements of the marketing mix (materialized in the existence of external marketing) lead to the establishment, completion and adoption by the marketing department, but also by the top management of the company of marketing strategies in services field (considering the double activity of the company). These strategies are very useful, leading to major changes in the company's activities. Realizing also that the product is the central pillar of the marketing activity, the companies attach a special importance to the product strategies and all elements are imprinted on them, namely: exclusivity, brand, service capacity management.

References

[1] Androniceanu, A. (2004). *Management public*, [Public Management], Bucureşti, Editura Economică.

[2] Angheluta, S. P., Burlacu, S., Diaconu, A., Curea, C. S. (2019). The Energy from Renewable Sources in the European Union: Achieving the Goals. *European Journal of Sustainable Development*, 8(5), p. 57.

[3] Ariton, D. (2007). *Strategii financiare ale firmei [Financial Strategies of Companies]*, Publishing House Europlus, Galaţi.

[4] Barbulescu, C. (2005). *Economia și gestiunea întreprinderii. [Economics and business administration]*, Editura Economică, București.

[5] Bodislav, A. D., Rădulescu, C. V., Moise, D., & Burlacu, S. (2019). Environmental Policy in the Romanian Public Sector. *The Bucharest University of Economic Studies Publishing House*, 312.

[6] Bran, F., Alpopi, C., & Burlacu, S. (2018). Territorial Development-Disparities between the Developed and the least Developed Areas of Romania. *LUMEN Proceedings*, 6(1), pp. 146-155.

[7] Burlacu, S. (2010). Role of Training in The Knowledge Society. In *Proceedings of Administration and Public Management International Conference*, (6(1), pp. 203-208. Research Centre in Public Administration and Public Services, Bucharest, Romania.

[8] Burlacu, S., Alpopi, C., Mitrită, M., & Popescu, M. L. (2019). Sustainable e-Governance and Human Resource Development. *European Journal of Sustainable Development*, 8(5), 16.

[9] Burlacu, S., Profiroiu, A., & Vasilache, P. C. (2019). Impact of Demography on the Public Finance of The European Union. *Calitatea*, 20(S2), pp. 136-138.

[10] Burlacu, S., Jiroveanu, D. C. (2009). It Governance and Educational Ideal, *Administratie și Management Public*, 13, pp. 73-82.

[11] Cătoiu, I., Teodorescu, N. (1997). *Comportamentul consumatorului*. *Teorie şi Practică*, [Consumers Behaviour. Theory and Practice], Bucureşti, Editura Economică.

[12] Cetina, I. (2005). *Marketingul competitiv in sectorul serviciilor*, [Competitive marketing in the services sector], Editura Teora. Bucureşti.

[13] Clarche, L. (2002). *Managementul schimbării: ghid practic privind producerea, menţinerea şi controlul schimbărilor într-o organizaţie*, [Change management: a practical guide to producing, maintaining and controlling change in an organization], Editura Teora, Bucureşti.

[14] Costache, G., Marinas, C. V., Igret, R., & Burlacu, S. (2015). Internship in the Hr Department – Organizational and Individual Perspectives. In *Proceedings of the International Management Conference*, 9(1), pp. 359-370. Faculty of Management, Academy of Economic Studies, Bucharest, Romania.

[15] Cretu, C. (2005). *Cunostințe economice fundamentale și de specialitate pentru examenul de licență, [Basic and specialized economic knowledge for the bachelor's exam]*, Editura Fundației Academice "Danubius", Galați.

[16] Dumitru, D. (2001). *Cercetări de marketing*, [Marketing research], Editura Star Soft, Alba Iulia.

[17] Galib, M. H., Hammou, K. A. și Steiger, J. (2018). Predicting Consumer Behavior: An

Extension of Technology Acceptance Model. *International Journal of Marketing Studies*, 10(3), pp. 73-90.

[18] Golea, P. (2003). *Management − abordare procesuală*, [Management - procedural approach], Editura Ex Ponto, Focşani.

[19] Grigore, A. (2008). *Marketingul Serviciilor*, [Services Marketing], Editura Fundaţiei Academice Danubius, Galaţi.

[20] Grigore, A. (2007). *Rolul relaţiilor publice în promovarea vânzărilor*, Lucrări Ştiinţifice, [The role of public relations in sales promotion, Scientific Papers] Academia Navală Mircea cel Bătrân, Constanţa.

[21] Grönroos, C. (2017). Relationship marketing readiness: theoretical background and measurement directions, *Journal of Services Marketing*, 31(3), pp. 218-225.

[22] Han, H. și Hyun, S. S. (2015). Customer retention in the medical tourism industry: Impact of quality, satisfaction, trust, and price reasonableness. *Tourism Management*, 46, pp. 20-29.

[23] Ionita, F., & Burlacu, S. (2009). Public Administration from Romania in the Knowledge Society and E-Learning. In *Proceedings of the Fifth "Administration and Public Management" International Conference: "Public Institutions' Capacity to Implement the Administrative Reform Process*", Bucharest, June 23-24, 2009, No. 25.

[24] Ionita, F., Ursacescu, M., & Burlacu, S. (2009). Public Services as Poles Of Regional Competitiveness In Sustainable Development. *Revista de Management Comparat International / Review of International Comparative Management*, 10(3), pp. 552-565.

[25] Ionita, F., Burlacu, S., & Gaidargi, A. (2009). Modern Approaches of the Management of Alternative Trade Systems, *Revista de Management Comparat Internațional / Review of International Comparative Management*, 51, 473-480.

[26] Jianu, I., Dobre, I., Bodislav, D. A., Radulescu, C. V., & Burlacu, S. (2019). The Implications of Institutional Specificities on the Income Inequalities Drivers in European Union. *Economic Computation and Economic Cybernetics Studies and Research*, 53(2), 59-76.

[27] Konus, U, Verhoef, P. și Neslin, S. (2008). Multichannel shopper segments and their covariates. *Journal of Retailing*, 84(4), pp. 398-413.

[28] Litra, M., & Burlacu, S. (2014). Management Regulatory Liberalization of the Public Service Contracts in the Rail Industry. *Administratie si Management Public*, (22), p. 73.

[29] Lovelock, C. și Wirtz, J. (2011). *Services Marketing: People, Technology, Strategy*. Ediția a 7-a. Upper Saddle River: Prentice Hall.

[30] Mihai, E. (2016). Patru companii de retail domină piața din România, [Four retail companies dominate the Romanian market], *Capital*, 20 aprilie (https://www.capital.ro/patru-companii-de-retail-domina-piata-din-romania.html) (accesat în data de 08.04.2020).

[31] Manolescu, A. (2007). *Managementul resurselor umane*, [Human Resources Management], Editura RAI, Bucureşti.

[32] Mohammad, H. I. (2015). 7 PS marketing mix and retail bank customer satisfaction in northeast Nigeria. *British Journal of Marketing Studies*, 3(3), pp. 71-88.

[33] Nicolescu, O. (2006). *Sisteme metode şi tehnici manageriale ale organizaţiei*, [Systems management methods and techniques of the organization], Editura Economică, Bucureşti.

[34] Popescu, L. (1996). *Managementul firmelor moderne: Principii, metode, strategii*, [Management of modern companies: Principles, methods, strategies], Bucuresti.

[35] Profiroiu, A., Burlacu, S., & Sabie, O. (2019). Reform of the Pension System in Romania. *Calitatea*, 20(S2), pp. 521-524.

[36] Rădulescu, C. V., Dobrea, R. C., & Burlacu, S. (2018). The Business Management of Distress Situations. the 12th International Management Conference "Management Perspectives in the Digital Era" November 1st-2nd, 2018, Bucharest, Romania, 1, pp. 741-747.

[37] Risco (2020). Miruna Maria Com S.R.L. (https://www.risco.ro/verifica-firma/miruna-maria-com-cui-29418606) (accesat în data de 19.03.2020).

[38] Sabău, G. et al. (2006). *Schimbările organizaționale produse prin reingineria proceselor economice*, [Organizational changes produced by reengineering economic processes], Editura Economica, Bucharest.

[39] Tsiotsou, R. și Wirtz, J. (2015). The Three-Stage model of Service Consumption. În *The Handbook of Service Business, Management, Marketing, Inovation and Internationalisation*, J. Bryson și P. Daniels (editori). Cheltenham: Edward Elgar, pp. 105-128.

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The Model of Entropy Value Theory for the Institutional Performance in Public Administration

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Abstract

The major transformations that the Romanian society is facing nowadays cannot but impose radical transformations, especially of the public management at all levels. In this article, we intend to apply value-based management adapted to decision making at all levels of development by public institutions. In order to understand the value phenomenon, both as an economic category of high complexity, as well as a social and cultural phenomenon, we propose to discuss the application of research methods appropriate to these events that make up the value phenomenon, but also to the behaviour of all systems involved in the mechanism of obtention and management of value. We propose the application of the general principles of the model of entropic value theory in the management of local public administration, at regional and national level.

Keywords: Value management, public management, transformation, entropy value theory model, value management.

JEL Classification: H83, P17

1. Introduction

Research and studies in the field of public policy are different from those of academic research in that they have an applied, oriented approach − firstly, towards designing and developing solutions for the problems of society − public policy is not limited to researching these problems, but it also has the role of issuing solutions

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in which they are to be applied, secondly – towards bringing arguments based on assumed values. The complex process of carrying out public policies and offering alternatives – these are exercises that are about skills, capacities and we do not judge performance.

2. Priority Issues in the Field of Public Management

In order to be able to build a modern public administration oriented towards the beneficiaries of public services, an open administration and receptive to innovative solutions, which simplifies and consolidates institutions and mechanisms, we need methodological and theoretical support. The discussions about the reform of the public administration in Romania give rise to some confusion regarding the meaning of this expression. Specifically, reform means more than improving administrative capacity. In short, the answer is that these are two different concepts of public sector organization (Profiroiu et al., 4).

In many countries of the world, there have been transformations in the field of public management. As confirmed by an author (Androniceanu, 2007, 2): *"In the United Kingdom, Australia and New Zealand were implemented the first major changes in public management from the perspective of the value system known in the Romanian and foreign specialized literature under the name of the New Public Management (NMP). The New Public Management (NMP) brings together values that shift the focus from traditional public administration to public management (Lane, 1994). The traditional model of organization and provision of public services, based on principles such as bureaucratic hierarchy, administrative planning, centralization of the decision, direct control and economic independence, are replaced by a management of public services based on a direct relationship with the market"*.

According to the author Gerrit van der Waldt (2014): *"as a subject of applied social sciences, public administration is a diversified field with fast evolutions. Simultaneously with the emergence of the production mode - knowing the model, the achievement increases the complex social challenges that cannot be accompanied by singular disciplinary perspectives."*

In the Uwizeyimana's (2017) opinion: "*The problems facing administrative systems are becoming increasingly complex, and a known subject to focus on is understanding how administrative systems are the government function and preparing people to work in such systems to promote efficiency and effectiveness. Facing the challenge of complexity"*. The subject of Public Administration must be able to produce graduates who have the appropriate aptitudes, attitudes, competences and capacities to navigate the complex environment on which the service delivery is based at present. This challenge touches on a significant question, that is, whether it can produce knowledge from a single subject, for the right people. Some authors have previously accused the Public Administration of not being able to be a subject matter because of its "promiscuous" nature, as borrowed from many other subjects to build its knowledge base. Such an allegation is likely to persist because today's

government issues cannot be solved by people - civil servants and politicians with a disciplinary focus.

According to Georgescu Roegen: "a specialist in the field of social sciences should feel much more attracted to arithmomorphism than any other researcher. We prefer to ignore the fact that no arithmetic model can present how the competition works or how the economic system turns into another, which does not mean that we are moving away from the dialectical nature of the economic process. Theoretical science is a living organism precisely because it emerged from an amorphous structure − taxonomic science − just as life appeared from inert matter. Moreover, as life does not appear anywhere where matter exists, so the theoretical science did not appear wherever there was taxonomic science: its genesis was a historical accident. Aspects of time in economic science. Economic activities are, first and foremost, the most important manifestation of time, far greater than our involvement in natural phenomena. Economic life is a unique process that began in historical times and in a disturbed environment." (Georgescu, 1996, p. 209).

3. The Model of Entropy Value Theory

The theory called the value theory based on the low entropy or Theory of the Entropy Value (TVE) will acquire paradigms changed from the current theories (The value theory - work, and the value theory utility) (Bran, 2003, p. 53).

Physical support of value. An important element for economic theories regarding value is the range of systems employed to obtain value. Former theories recognized a limited number of systems involved in the mechanism of obtaining and dimensioning value. The respective systems were limited to economic systems represented by the producer system and the consumer system. The phenomenal leap proposed by Professor Paul Bran is that in bringing in the mechanism of obtaining and managing value - the systems of the natural environment and of society.

In the author's opinion, the natural sciences have shown that life is due to substances that we encounter at every turn. Living organisms only maintain their life if they attract and transform low entropy from the primary elements of matter: the substance, the energy, the information.

Integrated into the natural circuit of matter, the living system of man is the beneficiary of a potential (low entropy), manufactured by the living and the nevi systems of Nature. Potential that allows us to exist, even if the processes we trigger in society and in the economy are very wasteful.

General principles of entropy value theory model construction. In the author's opinion, the correlation of the TVE model with the models of the other theories of value highlight the differences, but also the fact that the model of the value based on entropy encompasses the other models, leading to further knowledge, towards the real level of the conserved potential, as the value of the product obtained in t 1. (Bran, 2003, pp. 140-141).

Rethinking value management. *Firstly,* value management, economic potential at the societal level must consider both enhancing potential supply processes in the near or distant future and increasing the productivity of all processes involved in

obtaining value. *Secondly*, the mechanism of attracting low entropy from the environment, processing and preservation must be endowed with new technologies that will increase the transformation efficiency, with the reduction in the specific consumption of substance S and E energy. This process submits the attracted inputs (Pn, Ps, Pes) to a transformation process according to the technology and the purpose of each type of enterprise.

Potential Pn + Ps + Pes = Pep + Ed (1.1)
(Natural Potential – Pn, Social potential – Ps, Economic potential - Pes).

Through the process of transformation and then of preservation of the results of the transformation, a new degree of organization of the potential from the inputs in the form of a product is obtained, Pep, according to the specific rule of this process.

An original proposal is the introduction of the eco-field, force field concept (Bran, 2003, pp. 102, 108). The reform of the eco-field implies a radical transformation of the political, social and behavioural structures for all members of the society and, first, the driving factors at all levels. The form of existence of matter called "force field" is the organizer of the material phenomena around which it is formed. This aspect was elucidated in the case of the biological systems, being, in our opinion, valid also for the economic systems, such as the enterprise, the national and world economy. In the eco-field that surrounds the company, the main headquarters of the economic activity that we want to reform, the "reform matrix", which will organize the entire process of economic recovery, must be established. In the following stage of this paper we will present the discoveries of Pranghishvily (2003) in which the author rounded up the research on the subject of Entropy and Negentropy and their ecosystems.

Different forms of entropy (Pranghishvily, 2003, p. 18). At least four forms of entropy are found in the literature: 1. Entropy as the measure of the uncertainty of the state of any fully ordered physical system or the behaviour of any system, including living and non-living objects and their functions. 2. Thermodynamic entropy of micro particles or molecular (microscopic) sets. 3. Information entropy, or information uncertainty, reflects information about an information system. 4. Entropy, or behavioural uncertainty, of any unordered system up to macroscopic sets.

Negentropy. The famous French physicist, one of the creators of information theory, L. Brillouin, suggested that information equivalent to negative entropy should be called negentropy. The negative entropy of E. Schrödinger is fundamentally different from the negentropy of L. Brillouin. L. Brillouin and N. Wiener misinterpreted negentropy as anti-entropy or negative entropy (i.e., minus sign entropy).

Accounting for entropy (Pranghishvily, 2003, p. 25). Each system in the Universe contains, in addition to mass (substance) and energy, in an equivalent amount, their additional form of state is generalized negentropy.

The laws of energy-entropy balance for the reference point of the entropy of any living and lifeless system, one can take the most ordered state of the system when the entropy of the system becomes zero (E = Eo = 0).

The entropy and essence of I. Prigogine's theory (Pranghishvily, 2003, p. 36). Exceptional Belgian physicist and chemist, Nobel laureate Ilya Prigogine is the founder of the theory of irreversible processes of balance in nature and society. He showed that in external conditions that impede the state of equilibrium, the entropy increases, and if there are no obstacles, the entropy reaches an absolute minimum (zero). I. Prigogine formalized these processes as follows: the entropy of a process of equilibrium, or of a system of equilibrium, for n independent forces **x1, x2, ..., xn** is described by the expression:

$$E = \sum_{i,K} L_{iK} X_i X_k \tag{1.2}$$

where **Li, k** is a thermodynamic quantity that varies depending on the conditions. In addition, he proves that if Xi is constant, then for: ΔE / ΔdXi = 0 (i = 1 ... n) → min, and the total entropy flow will be equal to the absolute minimum

$$I_i = 0{,}5 \frac{\Delta E}{\Delta X_i} = \sum L_{iK} X_K = 0. \tag{1.3}$$

The total entropy Prigogine function, in the general case of the continuous system, when i-e forces and entropy fluxes i are functionally dependent on the condition (points x) expressed by I. Prigogine through the function:

$$E_\Sigma = \int E(X)\,\Delta V = \sum_{iK} \int X_i\,(x) L_{iK} X_K(X) \Delta V \tag{1.4}$$

V − the volume of a non-equilibrium system. Local entropy flow, E (x) integrated with quantum information, so information in the same volume ΔV, as entropy. The example of thermodynamic systems demonstrates the theme of total entropy.

New entropy and the principle of new maximum entropy in management of A. Panchenkov. The monograph proposes a paradigm called by the author new entropy. According to A. Panchenkov (1999), entropy is traditionally interpreted in all works (foreign and native scientists) as a measure of negative quantity, as a measure of disorder, chaos and disorganization and structure imperfection. The new entropy introduced by the author of the book, unlike the traditional one, has a different, positive, fundamental meaning - as a measure of the perfection of the structure, a measure of order, organization and has a content similar to negative entropy (anti-entropy) or negentropy. Based on this, the proposed maximum principle of the new entropy considered as the maximum principle of anti-entropy or negentropy, in the traditional sense of entropy.

The entropy compensation principle (Pranghishvily, 2003, p. 39) when studying a specific open system (A1), you must take into account all other systems (the environment) that interact with it, conditionally combined in system A2. In this case, the general (or combined) system (A3) is considered closed or isolated,

and for the A3 system the law of increasing entropy can be applied $\Delta E3 = \Delta E1 + \Delta E2 \geq 0$. Only in this case will the principle be true entropy compensation, which claims that within an isolated system, a drop in entropy in one system (-ΔE1) leads to an increase with the same (or slightly more) entropy in another system (+ ΔE2) or in the environment. Such an interaction maintains the balance of general entropy, that is. The principle of entropy compensation is realized.

The entropy approach to semantic (substantial) analysis of scientific information, (Pranghishvily, 2003, p. 41). If, using the entropy approach, according to K. Shannon, the information is analysed syntactically (quantitatively), then using the same entropy approach, the information is analysed at a more complex, semantic (substantial) level.

Entropy for the assessment of the state of the human body. (Pranghishvily, 2003, p. 46) Entropy is a measure of the probability that a system will remain in a certain state. Entropy is one of the fundamental properties of any system with probabilistic behaviour, offering new levels of understanding in coding information, system analysis, linguistics, biology, image processing, etc. The influence of external information on a system is estimated by changing the entropy of the system state.

Calculation of entropy for the monitoring and management of the project of modernization of the installation. (Pranghishvily, 2003, p. 47). The entropy models and the entropy calculations, besides the problems of thermodynamics and statistical physics, are beginning to practically apply in computer science, economics, project management and organizational structures, etc.

The quantity of information in the project is determined

$$I_p = -\sum \Psi (p) \ln \Psi (p), \quad (1.5)$$

p which coincides with the entropy E of the set G. This quantity determines the amount of information that the manager must face in the project management process. The quantity Ψ (p) is a measure of probability in the state-space of the project. The use of this formula to determine the amount of information from a project (I_p) in the risk management tasks in complex projects and to determine the entropy, performed according to the following algorithm. The first step is to consider project planning from a classical perspective. Furthermore, the entropy (E) of the project is the sum (E_{ID}) of each work, where the ID is the identifier of the work,

That is $E = \sum_{ID} E_{ID}$ (1.6)

At the second step of the calculation of the entropy E, of the work, the multitude of adverse, unfavourable events is determined. In the second stage, many adverse events are determined to calculate the entropy of E_{ID} work. ID - identifying the type of work activity. An example of a working program with the following parameters, presented early finishing (EF), late finishing (LF) and worst finishing

$$[EF + (d_u - d)] \quad (1.7)$$

in the case of an *indefinite duration* di <d <du, *where d is the duration, a du is the maximum possible duration*. Adverse events occur when work enters the critical path with a negative one.

The shaded segment E_I = [LF, EF + (d_i-d)] (1.8)

represents many adverse events. In the third stage, the set of adverse events I in case of a negative time reserve is defined as:

a) E_i= 0, if there is no uncertainty (1.8.1)

b) E_i = [LF, EF + (d_u-d)] if LF > EF > + (d_i - d), (1.8.2)

c) E_i= [EF + (d_i - d), EF + ($d_u$du + d)] if LF < EF + ($d_i - d$) (1.8.3)

In the simplest case, the duration δt is evenly distributed in the range (di, du). The probability of Pi, for the duration of the work to take the value (d_i, d_i + δt), is Pi = δt (d_u- d_i), and the entropy of the work is determined according to the formula

I = −∑Ψ (P) lnΨ (P). (1.9)

Example of work schedule indicating early finishing (EF), late finishing (LF) and worst possible finishing [EF + (du - d)]. In the sixth step, the individual entropy is determined:

$E_{ID} = -\sum_{E_u} P_i \ln P_i$ = - N_{E_u} $P_i \ln P_i$ = E_u /(d_u - d_i) ln P (1.10)

where P*i* is the measure the probability of working to get it states this parameter, and the formula for the total entropy of the project plan, which is the sum of the individual entropies, has the form:

$E_{\sum} = \sum_{ID} E_{ID} = \sum_{ID} E_u/(d_u - d_i) \ln P = \sum_{ID} E_u/(d_u - d_i) \ln P$, (1.11)

where the set of adverse events (E_u) is equal

E_u = [EF + (d_u- d) - LF] = [(d_u- d) −TF],
TF = LF - EF is the complete reserve. (1.12)

At the seventh stage, using the above formula (1.11), the chance opposite to the risk can be calculated, provided that the set of adverse events are replaced by the set of favourable events E_f (best possible end, late end), i.e. those events that give the work a positive margin in time and remove the work from the critical path. In order to determine the set of favourable events, it is necessary to use the index of the critical work CRIT (the probability that the work will reach the critical path). In the eighth stage, the entropy of other components of the project, such as cost, quality, specification, is calculated similarly.

The entropy value of each specific project shows how much information is required to work in a situation with uncertainty in process or probability. In other words, entropy shows the necessary power of the adoption system.

4. Conclusions

Entropy is a fundamental property of any system with ambiguous or probabilistic behaviour; therefore, it will be successfully applied in the management of public administration at all levels (national, regional and local).

It is known that any discrete sets, any objects and phenomena (systems) of animated and inanimate nature, without exception, contain features of order and disorder (chaos), certainty and uncertainty, organization and disorganization, and thus entropy. The value of entropy as a quantitative measure of uncertainty, unpredictability, disorder, chaos, disorganization of probabilistic systems is universal. Therefore, we must inevitably take into account the presence of entropy in the form of disordered, disorganizing, chaotic noise factors, in the behaviour of probability systems, in their elements and their interaction. Scientists from the beginning of the 20th century showed that we live in a world of not only molecular disturbance, but also in the world of macro-instability, and we have therefore adopted generalized entropy (GE) as a universal parameter - a quantitative measure of uncertainty or disorder.

One should account for Generalized Entropy (GE) and Generalized Negentropy (GNE) to improve the quality of system models and their calculation. An important part of abhorrence comes from the relationship between order and disorder in technology, nature and society, the laws of energy-entropy balance, the problems of entropy reduction and the process of self-organization of the system. The development of society on the path of self-organization and ordering or on the path of disorganization and chaos has entropic criteria. Due to these entropy criteria, a new mechanism for the emergence of environmental crises has been identified, which is not taken into account by modern environmental science. The conditions and limits of stability of a mixed economy are defined when the market consists of private and state capital. Perhaps the principle of coagulation of information due to the hierarchy is widely used by the brain in storing and implementing huge and numerous masses of information.

References

[1] Androniceanu, A. (2007). Noul management public [New public management] Online: http://ramp.ase.ro/_data/files/articole/8_05.pdf.

[2] Bran, F., Alpopi, C., & Burlacu, S. (2018). Territorial Development-Disparities between the Developed and the Least Developed Areas of Romania. *Lumen Proceedings*, 6(1), pp. 146-155.

[3] Bran, P., (1993). Reforma economică la români, [Economic reform for Romanians], *Revista Economica ASEM*, 3, pp. 17-24.

[4] Bran, P. (2003). Economica valorii, [Value economics], ASE Publishing, Bucharest.

[5] Burlacu, S., & Jiroveanu, D. C. (2011). The Develope of Software Solution for Supply Chain Management. *Revista de Management Comparat International / Review of International Comparative Management*, 12(6), pp. 140-145.

[6] Burlacu, S., Gutu, C., & Matei, F. O. (2018). Globalization--Pros And Cons. *Quality-Access to Success*, 19.

[7] Costache, G., Marinas, C. V., Igret, R., & Burlacu, S. (2015). Internship in the Hr Department – Organizational and Individual Perspectives. *In Proceedings of the International Management Conference*, 9(1), pp. 359-370.

[8] Georgescu, R. N. (1996). *Epistemologia roegeniană*, [Roegenian epistemology] coord. Aurel Iancu, Opere complete, VII, Expert, Bucharest.

[9] Gerrit, van der Waldt, (2014) Public Administration and transdisciplinary: a modalistic approach toward knowledge construction, *International Journal of Humanities and Social Sciences*, 32(3) SAGE, pp. 14-20.

[10] Ionita, F., & Burlacu, S. (2009). Public Administration from Romania in the Knowledge Society and E-Learning. In *Proceedings of the Fifth "Administration and Public Management" International Conference: "Public Institutions' Capacity to Implement the Administrative Reform Process"*, Bucharest, June 23-24, 2009. No. 25.

[11] Ionita, F., Ursacescu, M., & Burlacu, S. (2009). Public Services as Poles of Regional Competitiveness in Sustainable Development. *Revista de Management Comparat International / Review of International Comparative Management*, 10(3), pp. 552-565.

[12] Ioniţă, F., Burlacu, S., & Gaidargi, A. (2009). Modern Approaches of the Management of Alternative Trade Systems, *Revista de Management Comparat Internațional / Review of International Comparative Management*, 51, pp. 473-480.

[13] Jianu, I., Dobre, I., Bodislav, D. A., Radulescu, C. V., & Burlacu, S. (2019). The Implications of Institutional Specificities on the Income Inequalities Drivers in European Union. *Economic Computation and Economic Cybernetics Studies and Research*, 53(2), pp. 59-76.

[14] Profiroiu, M., Andrei, T., Dinca, D., & Carp, R. (2012). Reforma administratiei publice in contextual integrarii europene, [Reform of public administration in the context of European integration], Online: http://beta.ier.ro/documente/studiideimpactPaisIII_ro/Pais3_studiu_3_ro.pdf.

[15] Profiroiu, M., Andrei, T., Dinca, D., Carp, R., (2016). Reforma administratiei publice în contextul integrării europene [Reform of public administration in the context of European integration], Institutul European din România – *Studii de impact*, III, Studiul nr. 3, p. 4.

[16] Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2018). Demographic Explosion and It Governance In Public Institutions. *Managerial Challenges of the Contemporary Society. Proceedings*, 11(1), 18.

[17] Rădulescu, C. V., Dobrea, R. C., & Burlacu, S. (2018). The Business Management of Distress Situations. *The 12th International Management conference "Management Perspectives in the Digital Era"*, November 1st-2nd, 2018, Bucharest, Romania, 1, pp. 741-747.

[18] Uwizeyimana, D., E., (2017). The Multidisciplinary, Interdisciplinary and Transdisciplinary Nature of Public Administration A Methodological Challenge? *Article*, December 2017.

[19] Panchenkov A. I. (1999). *Entropy*. Nijnii Novgord: Interservis, 1999.

[20] Pranghishvily, I. V. (2003). Энтропийные и другие системные закономерности: Вопросы управления сложными системами, [Entropy and other systemic patterns: Issues of managing complex systems], *Rossiiskaia akademia nauk*, http://apolovoleg.narod.ru/olderfiles/1/PrangishviliI.VJEntropiinyeidr-88665.pdf.

[21] Iurin G. G. (2001). Energheticeskaia teoria ekonomiki jizni obscestva, [Energy theory of economics of life], World Bank Group, http://pubdocs.worldbank.org/en/470311538669100475/WBRER14-web-ALB.pdf.

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The Influence of the Globalization Process on the Natural Environment

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Abstract

Man in relation to the natural environment must show respect before the complexity and generosity of nature. Man must reconsider the primordiality of the natural environment. Our survival depends on our change, not on the environment. In the age of globalization, many of the rulers in highly developed countries are dealing with sovereign contempt, the environment can be present in the balance sheet of the company as represented by land, in its essential contribution through the low entropy represented by the natural potential of minerals, raw materials, but also in the uncounted goods: water, air, light, solar heat. As a rule, they are included in the favourable effects of the production and consumption processes. Given these conditionalities, in this paper we set out to present the influence of the globalization process on the natural environment from the perspective of value theory, knowing that the value-utility theory tried to replace the working time with a more adequate physical support but this theory failed to explain the differences in value for certain products.

Keywords: globalization, value, environment.

JEL Classification: F64

1. Introduction

The environment is present in the balance sheet of the company represented by land, in its essential contribution through the low entropy represented by the natural potential of minerals, raw materials, but also in the uncounted goods: water, air, light, solar heat (Dima et al., 2020). These are included in the favourable effects of the production and consumption processes (Bran et al., 2019).

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Given the enormous potential that exists in nature, the contribution of the environment to the economic process of the enterprise is highlighted as follows: the natural potential in the form of substance, energy and information is brought into the enterprise with the help of extraction, transport, research energy to be used accordingly with product information, technological (Negescu Oancea, et al., 2019). The research objective of this paper is motivated by the identification of the way globalization processes influence and affect the environment, in terms of expanding economic activities and consumption of natural resources. Furthermore, this paper will highlight an overview on the concept of value and added value to underline for future generations the need for protecting the environment by accelerating Research & Development to create value.

2. Current State of the Environment - Consumer Activities

The current state of the soil refers to the quality of the soil, water and air in the area, and whether the company has technologies that use these environmental components. In this case, the company must address the meteorological and investigation services for water and air quality, as well as the services provided by geologists and seismologists for soil quality investigation (Rădulescu et al., 2018).

The ecological restrictions imposed in the area of activity and not only, represent another area of analysis, in order to avoid the legal and financial consequences. This information establishes the decisions of establishment - development, but also those of production (Alpopi et al., 2018). At the same time, they will outline the size and structure of the consumption process.

The consumption process aimed at restoring the environment is only partially resolved at the firm level. Most of it is for the company, with the financial contribution of the companies and the population (Jianu et al., 2019).

The company organizes the following activities regarding the environment: activities to reduce environmental pollution by means of filtration, water treatment, waste disposal, controlled waste disposal facilities. These activities are investment type. The activities of redesigning technologies and products to reduce the consumption of natural potential and toxic waste are activities of scientific research type. (Bodislav et al., 2019).

The activities to restore the environment of the company and its immediate proximity, as well as to remedy some ecological disasters produced in the area due to the company's operations are of the investments and financial payment type. Another activity is the normal contribution to the ecological actions centralized through payments of fees, taxes, penalties (Angheluta et al., 2019).

2.1. The phenomenon of value

Value is the sum of the qualities that give price to an object, to a being, to a phenomenon. Value can also be understood as importance, significance, price, merit.

The value as a notion, is defined in DEX as: "*Acquisition of certain things, facts, ideas, phenomena to correspond to the social needs and ideals generated by them;*

the sum of qualities that give value to an object, to a being, to a phenomenon, which is important, valuable, worthy of appreciation, esteem".

Aristotle defined the value through physical, mental, moral or spiritual needs, recognizing in the economic value the exchange value and the use value: "*The use of any thing is of two kinds and, in both cases, the work serves as such, but not in the same way. One use is its own − as a utility, the other ... as a means of exchange (politics)".*

Since ancient times, two main directions of orientation of the way of defining the value have emerged: value = utility and value = work. In the first case, the production process and the role of the producer predominated. In the second case, the consumer process and the role of the consumer took precedence.

In both situations, the research that led to these axioms focused on how the value was revealed, in the form of the exchange value, on the market.

The value, in this acceptance, can be of four types. The direct value that expresses the benefit obtained by the user, the indirect value that expresses the benefit of an indirect consumer, the optional value that expresses the benefit felt by a consumer when he/she knows that a certain ecosystem will be preserved and the value of existence that expresses the benefit felt by existence, but not and the recovery, of some ecosystems, resources, landscapes. The sum of these four values would represent the total economic value.

2.2. The management and methodology of value

Value management has certain characteristics that we will present in this subchapter because it helps to outline the values necessary to protect the environment.

Defining value in relation to reality and the current achievements of science in general. We will see how far we are, by what we understand now about value (whether we are an economist or another professional) why value is really and what it should be in the future society, based on knowledge (information).

Obtaining and managing value will force us to get out of the narrow area of the company and even the economy, in order to understand what is happening in relation to value in the entire human society and the natural environment. Only in this way we will detect new exigencies, but also favouring factors in order to obtain value in the company or institution.

The mechanism of obtaining value will force us to reinterpret economic activity differently from the classic classification in primary, secondary and tertiary activities. Here, too, changes are needed in the development of management, so that those who practice manager-type actions can achieve their role as a catalyst with maximum efficiency.

Achieving a full understanding of the phenomenon of value means understanding our existence through the processes or dynamic states of the general system of Nature and its subsystems, environment, society, economy, firm. We will see that the arsenal of the tasks of a modern manager will include the responsibility of knowing and

influencing all these processes, whether they take place in the company, or in society or in the natural environment.

Understanding the concept of value will require abandoning its definitions based on work or utility and accepting a much more complex physical basis such as low entropy. This category generalizes a general characteristic of matter, rendering a certain degree of organization that can satisfy our needs of existence, as an individual, company, society, but also the growing needs of protection and restoration of the natural environment. It will not be easy! But otherwise, it is not possible! We risk being left out of the path to the information society, via sustainable development.

We will practice the general model of value based on low entropy to explain the evolution and changes of the general organization of human society. All these feelings of the society depend, to a large extent, on the functionality of the mechanism of obtaining and managing the value. History has, through the new theory of value based on low entropy (further noted by TVE), a new explanation for the most important events, but also for its scientific, technical, administrative, military, etc. concerns.

It is very important for the manager to know the value through measurement. The results, in the form of price, cost, are the visible and lucrative forms that accompany and characterize their activity. The cost shows, measures, through the monetary standard, everything that happens inside the company. The price, on the other hand, shows, also through the monetary standard, the results from outside the company or, in other words, a satisfied customer.

3. The Mechanism of Obtaining Value

The value is the result of the transformations that take place within economic processes such as production, distribution, exchange, consumption, in which human activity is involved. The human action that enters the economy area is associated with the activity of the people included in systems such as family, enterprise, national economy, world economy, cosmos economy. All these systems include the living system of man. They are under the impulse of internal or external forces, in the dynamic states of production, distribution-exchange, consumption.

The systems of the economy, society and the natural environment are responsible for obtaining and managing value. Economic processes are externalized and can be perceived by us in the form of economic, but also social, biological, chemical, and physical events.

All these events included in the economic phenomenon, give it a complex aspect. The same types of events are present in the mechanism of obtaining and managing value in the economy, in the form of the economic phenomenon of value.

In the history of economic science two directions have been highlighted regarding the definition of value: the theory of value based on work (TVM) and the theory of value based on utility (TVU).

According to the labour-value theory, value is created in the production process and its physical support is the duration of work (social time required). In connection

with this theory, a number of explanations have been formulated regarding how value is created. Karl Marx was of the opinion that one thing has value because it materializes human labour.

Adam Smith considers work to be the only creator of value and that human activity creates the mass of the goods it consumes each year, while Turgot sees work as an expression of the degree of esteem that man gives to the various objects of his desires.

The theory was formulated in the period when the technique was poorly developed, and the challenge was to meet the needs of the growing population.

The value-utility theory has tried to replace working time with more adequate physical support. This theory has failed to explain the differences in value for certain products. The best-known paradox is water-diamond. To explain this situation, the concept of rarity was used.

3.1. Processes of the mechanism of obtaining value

In the mechanism of obtaining value, the economic processes of both production and consumption, as well as the natural processes from the environment and the processes specific to social life, matter.

Probably the most difficult limit is the lack of an integrator of the multitude of strategies that are being developed however in many areas, including security, instead the lack of a single approach methodology and definitions notions being used. (Pop, Franc, 2017)

The processes of the mechanism of obtaining value are of two types: primary processes and complex processes.

The first primary process is transformation. Referring to the Great Explosion scenario, the initial explosion was a process of transformation, by which an organization of matter was realized, thus low entropy appeared.

The second primary process is conservation. The particles and radiations produced by the first process have entered the conservation process of these primary products in the form of stable structures of matter: substance, free energy, information.

Based on observations on the phenomena in Nature, we can hypothesize that there is a third primary process, that is, transfer. The products of the first two processes are moved in space and time through the transfer, becoming outputs for one system and inputs for another system.

The dynamic state in which the system of equilibrium of the Universe entered is the first complex process. The great explosion transformed the pure energy into particles and radiation that were preserved in the form of substance, free energy and information. These have been transferred in space and time, becoming a raw material for the training systems.

As in the case of the first complex process, the second one uses the three primary processes, forming complex structures. The formed systems transfer to them substance, free energy and information and transform them into low entropy corresponding to organization with the needs of the system in question, following

that this low entropy is preserved in material structure, in movement, in forces and in high entropy. These results are the services that will be transferred in space and time.

The third complex process ends the cycle of the Universe. Systems far from equilibrium and those close to equilibrium are brought to a system at equilibrium. The structural systems of Nature are transferred to the complex process to be subjected to a transformation process (the Great Implosion). The results of the transformation are conserved in the form of pure energy, energy that is transferred in space and time. The imbalances generated by globalization, intervened within the functional relations between the components of the system, were accentuated by the intensity of decisional impulses in short time intervals, which contributed to the emergence of strong gaps between exploitation capacity and environmental protection. (Peptenatu, Pintilii, Draghici., 2011).

In conclusion, the primary processes and the complex processes specific to the general system of Nature also occur in the systems involved in the mechanism of obtaining and managing value in the following forms: the production process, the consumption process, the liquidation process.

Regardless of the type of system in Nature (environment, society, economy), the dynamic states in which they enter are the same: consumption, production, liquidation. These complex processes, in their turn, have, in different proportions, the primary processes: transformation, conservation, transfer.

4. Conclusions

In the age of globalization, many of the rulers of the highly developed countries treat with sovereign contempt anomalies in nature without perceiving the true dimension of nature. With such a conception, it is not surprising that the West has had unparalleled success in aggression over the domination and unscrupulous modification of the natural environment. And the planetary admiration for these achievements is just another danger that emerges in the existence of the sphere by generalizing this aggressive and selfish way of abandoning humanity's relations with the natural environment. (Serban. M. 2013). The late university professor, Paul Bran, in the economic work of value, said that nature had to die little by little in order to reconsider the role and size of the environment. The dimension of man through the escape from nature explains the ever-present striving in his existence to free himself from the pressure of environmental factors. Gradually, through the desire for independence of submission to nature, man moves away from nature and has succeeded in creating a very complex living environment, as Paul Bran (2002) pointed out, by his dynamic heterogeneity.

It is individualized not only the natural environment but also the transformed, anthropized environment. The anthropization of the environment is continuous. Man is the maker of increasingly sophisticated objects that often have impoverished nature by burdening it with the residues of production and consumption. The human life environment is of great complexity. A future direction of research may be related

to the analysis of the effects of globalization and the associated conspiracy theory on the environment.

Developed countries have been mainly the promoters of new technologies through globalization. Emerging economies will, however, exercise increasing competition on it as it advances rapidly in the value chain. The gap between more technologically advanced regions and the least advanced are likely to deepen if governments do not invest in education, if they do not provide to citizens the possibility of acquiring the appropriate skills, if they do not encourage innovation, if they do not ensure fair competition and if they do not adopt smart rules when necessary. (COM, 2017)

At the moment, the economy has no remedy. A first solution could be a new paradigm of the value of appealing to ecological wisdom. The analysis of the effects on the environment must also take into account the synergistic effects of human actions at local, regional, national and international levels. Man does not have to assert that his existence can be without the other trophic chains. Everything has a beginning, so we should not pedal to self-destruction and let nature live, and through it we will live. Economics has focused on explaining the elements of an economic nature and on synthesizing models and tools for intervention to change the economic phenomenon in accordance with our value judgments.

Economic science consists of the coherent set of notions, ideas, theories and doctrines, which reflect in the plan of thought economic acts, facts and behaviours, value judgments on them, as well as techniques, methods and procedures for measurement, evaluation, management and stimulation of economic activities.

As long as the paradigm of a science is verified in contact with the reality to which it refers, it is useful to explain the phenomenon, but also as the "main source of training" necessary for those who continue basic research or, conversely, deal with the "gardening" of the basic theory to provide the theory with the technology and application tools.

The old paradigm is a brake on economic development. When the paradigm shows signs of fatigue and anomalies amplify, education made in the sense of unconditional respect for the science of the day becomes a brake.

In the age of globalization regarding the evolution of phenomena, we find that too few were those who understood that the 20th century broke through values scenarios. By the value mechanism, we mean that human society is closely related to the nature of the Earth's sphere.

To mitigate the impact of globalization on the environment, a common position of all Member States at European Union level is needed, based on synergistic instruments, with multiplier effects in different contexts.

All human activities have a direct impact on the natural environment. Our survival depends on the ability to change ourselves, rather than to change the environment. In the current period, governments must act not through false scenarios, but to understand the ignorance of the laws governing the existence and functioning of the industry sphere to find creative solutions to solve problems. Let's reconsider the planet's environment and spirituality now, when it's not too late.

References

[1] Alpopi, C., Burlacu, S., & Iovițu, M. (2018). Procesul de globalizare și politicile ecologice. In: *Competitivitatea şi Inovarea în Economia Cunoaşterii*, 2, 28-29 septembrie 2018, Chișinău, Republica Moldova: Departamentul Editorial-Poligrafic al ASEM, pp. 317-324.

[2] Angheluta, S. P., Burlacu, S., Diaconu, A., & Curea, C. S. (2019). The Energy from Renewable Sources in the European Union: Achieving the Goals. *European Journal of Sustainable Development*, 8(5), 57.

[3] Bodislav, A. D., Rădulescu, C. V., Moise, D., & Burlacu, S. (2019). Environmental Policy in the Romanian Public Sector. *The Bucharest University of Economic Studies Publishing House*, 312.

[4] Bran, F., Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2019). The Anthropic Pressure on the Forest Space. Dysfunctions and Risks in Romania. *Quality-Access to Success*, 20.

[5] Bran, F., Alpopi, C., & Burlacu, S. (2018). Territorial Development-Disparities between the Developed and the least Developed Areas of Romania. *LUMEN Proceedings*, 6(1), pp. 146-155.

[6] Bran, F., Burlacu, S., & Alpopi, C. (2018). Urban Transport of Passengers in Large Urban Agglomerations and Sustainable Development. Experience of Bucharest Municipality in Romania. *European Journal of Sustainable Development*, 7(3), pp. 265-273.

[7] Bran, F., Manea, G., Ioan, I., Rădulescu, C. (2006). *Economia în clepsidra antropică*, [The economy through the entropic hourglass]. Bucharest: Economica Publishing.

[8] Bran, P. (1994). *Finanțele întreprinderii. Gestiunea fenomenului microfinancier* [Company' finance. The management of the the micro-financing phenomenon], Bucharest: Ecnomica Publishing.

[9] Bran, P. (2009). *Managementul prin valoare* [Value based management], Bucharest: Universitara Publishing.

[10] Comisia Europeană COM (2017). Reflection Document on the Valorization of Globalization Opportunities, No 240 din 10 mai 2017.

[11] Dima, C., Burlacu, S., & Buzoianu, O. A. C. (2020). Strategic Options for the Development of Ecotourism in the Danube Delta in the Context of Globalization. *In SHS Web of Conferences*, 74, p. 04005. EDP Sciences.

[12] Jianu, I., Dobre, I., Bodislav, D. A., Radulescu, C. V., & Burlacu, S. (2019). The Implications of Institutional Specificities on the Income Inequalities Drivers In European Union. *Economic Computation and Economic Cybernetics Studies and Research*, 53(2), pp. 59-76.

[13] Negescu Oancea, M. D., Burlacu, S., Buzoianu, O. A. C., Mitrita, M., & Diaconu, A. (2019). Strategic Options for the Development of Ecoturism in the Dornelor County. *The USV Annals of Economics and Public Administration*, 19(1 (29)), pp. 21-28.

[14] Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2018). Demographic Explosion and it Governance in Public Institutions. *Managerial Challenges of the Contemporary Society. Proceedings*, 11(1), p. 18.

[15] Peptenatu, D., Pintilii, R. D., & Draghici, C. (2011). Environmental Risk Management of Urban Growth Poles Regarding National Importance. Int. *J. Environ. Sci. Technol*, 8, pp. 737-746.

[16] Pop, N., Ioan-Franc, V., (2018). *Romania in globalization: argumentation, attitude, action and responsibility*, Economic Information and Documentation Center Publishing House.

[17] Rădulescu, C. V., Dobrea, R. C., & Burlacu, S. (2018). The Business Management of Distress Situations. The 12th international management conference *Management Perspectives in the Digital Era*, November 1st-2nd, Bucharest, Romania, 1, pp. 741-747.

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Challenges Regarding Food Resources in the Context of Globalization and Population Growth

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Abstract

Taking into consideration the peregrinations of goods and exchange between merchants, agricultural producers and customers in good time, the distribution structure implies high efficiency, which can result in higher costs mainly incurred by the consumers. These transactions are often restricted by the geographical position of the agricultural land used for the road infrastructure and the distribution of the population, thus underlining the ties between merchants, farmers and consumers, the links and the distribution of the population. The technical advancement created by the transport system used the advanced agriculture systems and the mode of delivery to the consumer in real time. In order not to enter into exogenous or endogenous generation cycles, we should apply optimum field growth to the farms. Through this article, we intend to present the current challenges regarding food resources in the context of population growth and globalization.

Keywords: globalization, demography.

JEL Classification: F6, N3, Q15

1. Introduction

Today, the agricultural industry is focused on delivery to the trader and the consumer, to the agricultural producer in a timely manner and is based on productive economic processes of size, including three evolutionary factors: the development of working standards, the large-scale execution and the optimization

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of downtime (Bran et al., 2018). A clear example of this is the evolution of tomatoes, which while purely normal, can be regulated and manipulated anthropologically. The tomato warehouse (ketchup, tomato juice, canned whole tomatoes, etc.) needs an integrated technology flow to avoid high costs during downtime. The operating structure of the agricultural-consumer network must also be streamlined by means of a timely delivery mechanism. In order for the final picture to be complete, it is important to take into consideration not only the appropriate authorities, but also the fact that environmental and health requirements are also in place in the cultivated crop (if the processed vegetables are bio-, eco-or GMO-modified organisms), which are already regarded by the customer (Low & Vogel, 2011). With respect to the region of origin, we apply in particular to the US sector (Kummer, 2010), where Walmart has sought to reduce the gap between the agricultural producer and the final consumer, up to the point of forcing local conglomerates to enforce a strategy of financial assistance to outsourced farmers (Radulescu, et al., 2018). Through these new features of products, new needs emerged from the distribution chain that reduced the distance, but increased the working rate. However, in order to increase the efficiency of the distribution to the trader (respectively final customer), the strategy of work and development has been assigned to the carrier, because it can optimize the dead times by calculating the production, harvesting, processing and transport times to the trader and which can also offer a product whose life is long enough to not create losses due to the expiry of the shelf life.

2. Literature Review

Recent studies show that developing countries have grown much faster than industrialized countries and this convergence of growth has potentially very important implications for global food demand and global agriculture. The same studies show that food demand will double by 2050 and the determining factors are the increase in per capita income rather than population growth, which, the researchers conclude, contrasts with the historical pattern in which population growth influences food demand growth (Fukase & Martin, 2020).

In fact, more and more researchers believe that in the coming decades mankind will demand more food (Schneider et al., 2011). This consideration would not be surprising and alarming if it were not corroborated by the fact that throughout history, human populations that have experienced deficiencies in food production would have been growing. And this growth caused the local overexploitation of natural resources and most likely led to the disappearance or collapse of several ancient societies (Diamond, 2005 apud Schneider et al., 2011).

But these threats seem to be present today. Global population growth and urbanization have meant a decline in natural resources, such as land for food production (Mok, Tan, & Chen, 2020). The problem becomes essential when trying to resolve the situation by abandoning traditional production methods and including risk models. In this regard, worrying examples are given such as India, in which it is expected that fertile land will be increasingly scarce because of rapid

urbanization (Shukla, 2017). Of course, some modern methods are considered useful by current research, such as the exchange of food between human populations. These exchanges can mitigate the risk resulting from variable food production (O'Dwyer, 2020). Other theories such as consumer resource theory recognize the importance of finding food. They examine the problems as a whole and explore both optimal dietary patterns and behavioural strategies or population dynamics and the structure of the food web (Wilson et al., 2018). Other researchers associate various relationships such as the relationship between food production and the use of water resources or energy consumption. They find that beyond ensuring the necessary resources, it is also very important to guarantee food security (Yang, Wang, Wang, & Shao, 2017). Some research has gone further and established that climate change, population growth and economic development are critical challenges in ensuring water, energy and food security both nationally and globally (Zarei, 2020).

3. Research Question

Can Trade be considered the soul of food distribution to the population and the basis of globalization?

In our study, the notion of a merchant as a sign of organizational productivity was introduced by the fact that major merchants come from developing countries with access to logistics and global growth. We notice that a scalable model has been developed for optimum performance (in terms of volume and time). Another result was that in order to secure access to a high shelf life, major retailers included indigenous suppliers who were autonomous of the decision-making process, but not in terms of distribution time and volume. In order to minimize the costs of the manufacturer, to subcontract the agricultural conglomerate and to buy the supplier, the producer becomes a niche for a single agricultural commodity or for a single agricultural class only. We may conclude that this direction has been partly imposed, since the profile studies have suggested that there is loss of consistency by industrial manufacturing processes from the point of view of nutritional content, but also of the minimum requirements to be achieved (USDA). Between 1950 and 2000, agricultural crops had a nutritional loss of 6% in protein and 38% in riboflavin (Davis et al., 2004), albeit with a rise in pesticide amounts (Ata et al., 2012) and organic fertilizers that are now present in agricultural groundwater via the natural circuit (Berman et al., 2005). Another question that our study tried to address was: why are there such findings that affect the nature of the commodity, the atmosphere and the wellbeing of the consumer? One potential explanation is that since they have a long-life cycle, productivity is above average, and they look really "healthy" and still young. The finding is that these are traits of mass production, of poor dietary content and that they spend a lot of time in the flow of delivery. Thus, processing can be seen as an aspect of the horizontal growth of the agro-industrial process, which is part of the vertical delivery chain for the final customer and which by the payment of the commodity, helps many complementary

industries. Local agriculture could thus become the first step towards agricultural wellbeing, to the detriment of global production, either super-industrialized or chemically super-processed. One of the only viable long-term outsourcing models is to be considered. In the case of a corporation, the outsourcing process has a long-term propensity to disrupt the corporate culture and to obstruct the company, creating a malicious reliance on the chances of creating a rival within the outsourced business (Burlacu et al., 2018). The balance gained through the method of exporting production to an agricultural conglomerate may be considered exceptional, since it reflects a win-win scenario in the long run. In order to outsource the corporate mechanism locally, it could be coordinated with the retailer's delivery system by converting the working arrangement of the distribution network into operation or by improving the relationship between the agricultural producer/processor and the retailer's chain of stores. Or by building constant flow warehouses from which to supply the stores of the merchant (additional storage costs and new delivery costs arise in the warehouse-store relationship) and the high degree of rivalry would not allow the use of price differences (For example, Walmart introduced the Heritage Agriculture Initiative, which emphasized all distribution systems, while highlighting local character and in line with competition rates.

We also suspected that the agricultural cycle, which involves the productivity of the cultivation of exogenous factors, also had to be applied in the processing and cyclical growth of the outsourcing producer (weather and pests). In agricultural development models, the "Three Sisters" concept is illustrated, which is based on an alternate crop: wheat, beans all pumpkins, and at the same time, on the same arable field. That is because maize gives the climbing structure for beans, because beans provide the nitrogen required for maize and because the pumpkins do not give pests access to cover the field (Ata, et al., 2012.) This practical balance could be a model of agricultural cover base. For the outsourcing phase, we have big consequences in the manufacturing of product and brand specifications depending on the conglomerate or trader with which it is made (Bodislav & Bran, 2017).

4. Research methodology

In order to highlight the challenges of globalization, we tested the following hypotheses:

Hypothesis 1. Population growth is directly influenced by cereal production

Hypothesis 2. The densely populated areas are close to the cereal areas

For typing hypotheses, the economic literature abounds in standard tests such as multicollinearity (Farrar-Glauber test, Klein criterion, Belsey-Kug-Welsch test), error autocorrelation (Durbin - Watson test), heteroscedasticity of errors (Goldfeld-Quandt test), normality of distribution errors (Jarque-Bera test, Shapiro-Wilk test) etc. In recent times, however, there are several modern methods that come to complete the collection such as the BDS test, the test based on the dispersion ratio or the Ng-Perron tests (Jula & Jula, 2014). In the paper, we highlighted the trends of data series over comparable time intervals.

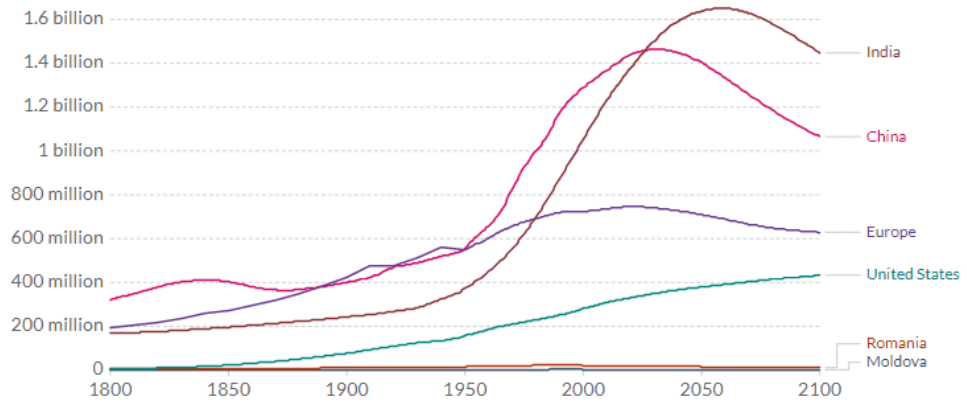

Figure 1. Population growth and forecasts
Source: https://ourworldindata.org/grapher/projected-population-by-country

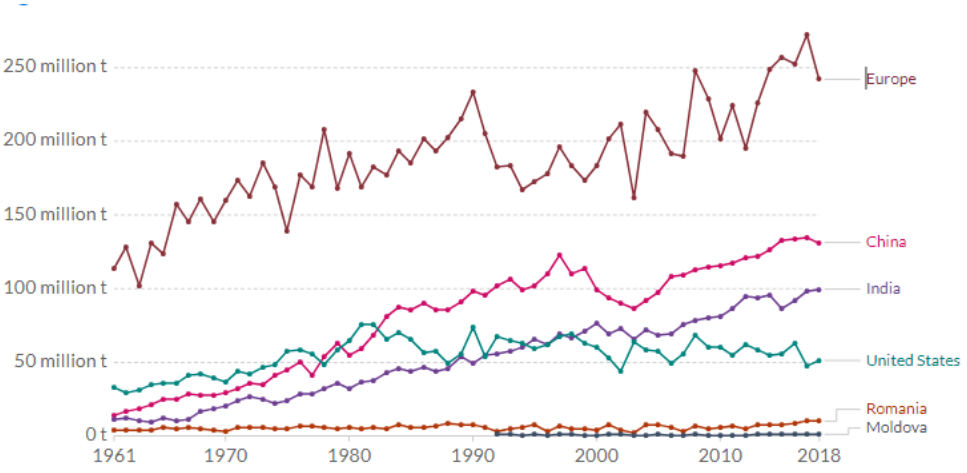

Figure 2: Cereal production
Source: https://ourworldindata.org/agricultural-production#cereals

Figures 1 and 2 highlight the evolution of the population and its trend, respectively the evolution of cereal production. The analysis of the available data allowed us to find that although the trends are increasing, there are not enough researches to justify the existence of a correlation between the global population growth and the increase in cereal production. There are a number of factors of technological progress on the one hand and socio-economic changes on the other that would justify these increases. The hypothesis remains open and we will consider it in our future analyses.

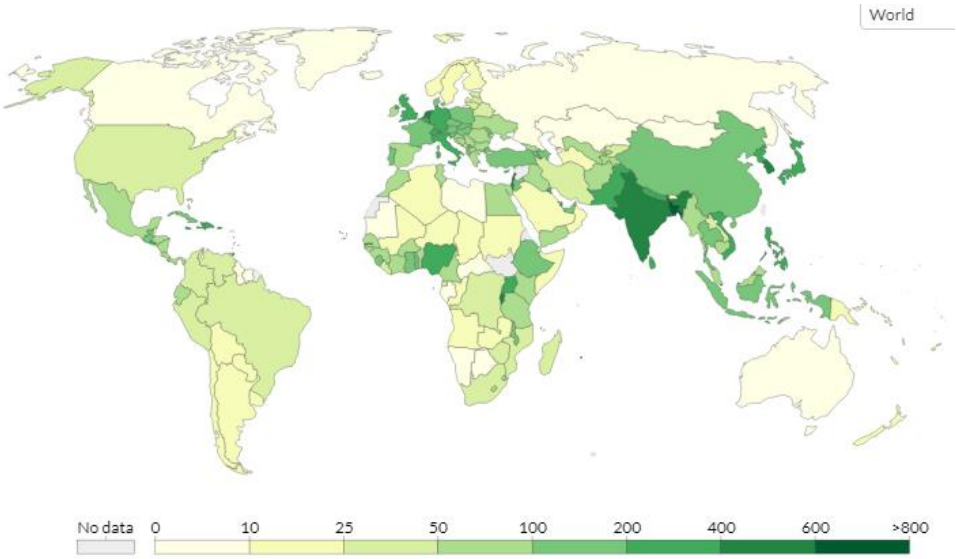

Figure 3. Population density (inhabitants / square km)
Source: https://ourworldindata.org/

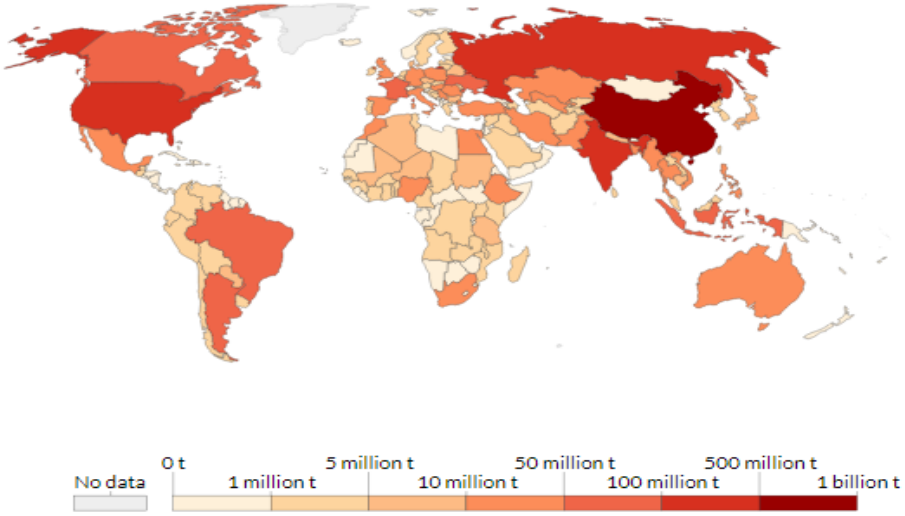

Figure 4. Cereal production in 2018
Source: https://ourworldindata.org/agricultural-production#cereals

As can be seen in Figure 3, areas with high population density are found mainly in territories whose climate allows both agricultural activities and where there are

important soil and subsoil resources, including drinking water. Figure 4 highlights recent cereal production. Starting from the observations in these figures, correlated with the analysis of globally available data, we can say that hypothesis 2 is partially confirmed. To clarify our suspicion, we will analyse in future works other possible factors that may directly influence the density of inhabited areas such as geo-political, strategic-military and environmental factors. Also for clarification, in the continuation of our research, we started from general aspects and we continued with aspects specific to a standard production-processing-distribution model of perishable products.

5. Findings

The standard model of the production − processing − distribution system of agricultural perishable products

Usually, any model that is based on a perishable product distribution process starts from the manufacturer, who cultivates the product being subcontracted or whose products are contractually reserved by a merchant who offers them for sale to the customer. The only factor that could be calculated in advance with a high rate of compliance with reality was the total expected demand for the product in question. Given the short product validity period, the expected demand was relatively easy to quantify, as it was short-term and thus traders were able to place fixed orders to the producers with whom they developed long-term business relationships and to which, depending on the order, they could add new producers, which led to the idea that for the unprocessed products the spot market can be approached. Another finding was that the short-term relations between the agricultural producer and the trader may arise as a result of temporary excesses in customer consumption and the surplus of some producers (Troop, et al., 2008). As far as the agricultural producer is concerned, it has two options:

1. Coverage of agricultural production: to produce limited quantities of several products and based on contractual relations with one or more traders;
2. Specialization on a single agricultural product (the tomatoes in question): this increases the risk of achieving optimal production, but also at the request of the trader (this risk is optimized through the contract with the trader).

In this research, we can also bring forth the idea of competitive advantage and comparative advantage of the independent agricultural producer, which by the risk assumed can ensure a sale price without competition, at an amount cultivated per hectare higher than the competition and at a share of advantage above average. Considering that we do not deal with a complex production or with too many variables in the production model, it turns out that the involvement of the production factors on the product is the same for the single product and for the diversified manufacturer.

At this point, the choice made by the retailer to protect its continuous distribution flow, if it buys tomatoes from a single manufacturer that covers its

needs (the supplier's monopoly), will get a very good price that will allow it an excellent additional commercial advantage, respectively a large profit (Jianu et al., 2019). If this does not include distribution, then this variable is negotiated and supported in whole or in part by one of the parties. In the model based on storage before distribution, there is an additional cost compared to the initial and the modification of the structure of the transport costs, respectively there are the costs of managing the check-in and check-out at storage, plus the cost of inventory.

The structure of the transport costs in the distribution system has not been the subject of our research, but to understand the context, it will be presented broadly hereunder:

1. The agricultural producer: if the agricultural producer bears the cost of transport to the distribution warehouse or to the merchant's stores, it may include it in the price asked to the seller asking price. Volume variables over cross-distances result in the type of trucks used, whether they are included in their fleet or are an outsourced service. The small quantities carried are contrary to economies of scale and thus may lose the competitive advantage initially created;
2. Central warehouse trader: aggregating the distribution of fresh products from several categories decreases the cost of transport for the seller, but only over medium or long distances significant gains are noticed and that when the trucks used in the distribution are always full and the travel of return to the central warehouse are also taken into account (these are empty, but with a tax, that would not be paid in the case of direct distribution);
3. Direct distribution retailer: in this case there are costs related to inspecting the goods in each store (which in the centralized distribution are covered at the central warehouse) and the cost of the commercial space, being cheaper to build a warehouse for several stores in an area with cheap land or in an area with former decommissioned production facilities (Greenfield versus Brownfield).

In order to show the true value of distribution cost as the main selection factor between the local agricultural producer as compared to the economies of scale-based system, we will approach the dispersion of the positioning of agricultural land and the central warehouse or the seller stores, depending on the seller's storage mode. In addition to the idea addressed in the first part of this article, that of the advantage created by the specialization regarding the production of a single product, the tomato, in our case, it must also be justified the location of the agricultural land and the distribution of agricultural production.

In our research, we conducted an experimental study in which we assumed that three producers are at the same distance from the central warehouse or retailer's stores and can produce the same quantity, using arable land to the maximum potential, the differences being in the choice of having a specialized or diversified crop. Then, we assumed that one decides to specialize and the other decides to protect the production. Upon harvesting, the contracting retailer has chosen the final supplier and completes its strategy, which can be with a single supplier of products or with several suppliers per agricultural product (here the quantity being

the same in both cases, it proves that they had to divide the quantity taken over by the retailer). We found that the merchant's strategy also included the inventory / warehousing model, either through the central warehouse or through the direct warehouse storage. The seller's work balance was based on the balance between long distance transport from multiple suppliers versus a single supplier offering the maximum transport load to a central warehouse. The distance between the warehouse and the assigned stores could be calculated for a single return flow (all stores were supplied and there was only one travel-back with the empty truck). Depending on the distance between the central warehouse and the store (or the order in the delivery process), there were some differences in the prices charged in stores for the same agricultural product, from the same stock. Basically, the cost with a central warehouse was partially depreciated by the disappearance of quality control positions created and by taking over inventory in each store, this process taking place at the warehouse, and the inventory was managed electronically. Checking the quality of the products was a procedure that eliminated at least one employee from the workflow, and those responsible for this were occupied with receiving other goods in the store.

At the same time, the price paid to the agricultural producer became a cost to the trader, and the good became an intermediary good in the flow to the consumer. This cost of the product was surrounded by handling and transport, which according to the staff is standard, but the transport could create significant differences between the profit share on the product and its competitiveness compared to the others, and an influence can have external variables, in mainly the transport infrastructure that can reduce the delivery times if it is optimally designed and this is the defining element in creating a full scale economy (including here the production of the agricultural product, the distribution and the competitive price implemented at the shelf). Returning to an element previously highlighted, that of the cost of space in a store per square meter, here the comparison between the rent paid per square meter and a policy of daily or semi-annual distribution of products appeared, thus limiting the storage area of the store. The flow from the producer was not daily, from where a warehouse is needed to store agricultural products before entering the store.

Returning to the choice of the producer whether to specialize in the production of a single agricultural product (tomato production), it had the open path to an economy of scale, but with the risk assumed by a single good production, which becomes a competitive advantage, which is possible or attenuated in relation to the retailer, if the agricultural producer provides transportation to the store (most often, the transport is provided in a warehouse to which several shops are assigned). If the manufacturer had to deliver to several stores, it made the same transport (preferably with the same truck to reduce costs), and the cost per kilometre was higher, as well as the economic value and time consumed, taking into account the fact that the shops were located in crowded areas and, consequently, to the time spent in high traffic, the time of unloading and taking over the delivered product was added.

Conclusions

In order to be able to draw a conclusion on the subject of the choice made by a global trader to keep the production geographically dispersed or to use agricultural conglomerates by subcontracting production exclusively for the trader, and from the perspective of the agricultural producer, we have the problem of whether approaching the market at the global, regional or local level and the costs that arise in the agricultural products offered.

To the two views are added the perishability of the products, these being ones that require a calculation of the distribution times (which relate to the natural environment, producer and processing for distribution and retailer) and creating an optimal working time between process times, crop harvesting and geographical distribution (either in distances or in population density). Lowering costs with transportation and product differentiation bring profitability rates to farmers and traders as well, but the balance tends to lean towards the surplus of profitability for the merchant, as it can monetize customer-targeted marketing (profit margins are higher in business-to-consumer, than in business-to-business relations). Developing transport strategies can be the solution for attracting a large retail group as a future customer for agricultural producers, all at the expense of another supplier (agricultural producer), because the cost of transport incorporated by the producer leads to obtaining a supply contract. Regarding the diversification on the same perishable good (tomatoes, in the case of this work), we have to deal with the construction of brands based on how the final product is obtained, either bio or eco or mainstream and this differentiation can be profitable for the producer because it will charge a higher price for the products offered differentiated, but the profitability is on the part of the trader because it can monetize the respective product by marketing its characteristics: local origin (appeals to the nationalism of the customer and the feeling of belonging to the group), and the way the product is obtained (bio and eco products are obtained from soils that are not chemically impregnated, treated with natural products and that do not harm the environment in the long run). These two characteristics create added value for the product and the trader, which are not obtained by direct quantification of some products but are obtained as a secondary calculation, thus the profitability rate being higher.

Finally, it should be remembered that certain production methods are only feasible in certain areas and that, thus the implementation and feasibility process will be pursued after the analysis of soil, atmosphere, anthropogenic environment and usable infrastructure characteristics, taking into account the relationship established during the research phase: the distance between a city or an urban centre and an agricultural supplier is directly proportional to the land area required for the production of the requisite agricultural products. In the long run, the effect of the breakthrough introduced by the IT&C sector may be one that will generate a split in the conventional structure of processing, delivery and selling of agricultural, ecological, organic and natural goods, which may contribute to the disappearance of the industrial intermediary circuit of retailers, but which will result in the benefit of the bio-consumer, the end-user.

References

[1] Ata, B., Lee, D., Tongarlak, M. H. (2012). Got Local Food, *working paper Harvard Business School*, Ianuarie 2012.

[2] Berman, J., Arrigo, K. R., Matson, P. A. (2005). Agricultural runoff fuels large phytoplankton blooms in vulnerable areas of the ocean, *Nature*, 434/2005, pp. 211-214.

[3] Bodislav, D. A. (2012). "Locally or Globally: Agribusiness from the globalization's perspective", *working paper*.

[4] Bodislav, D. A., & Bran, F. (2017). Using technology as key element in creating rationality in natural resources usage.

[5] Bran, F., Alpopi, C., & Burlacu, S. (2018). Territorial Development-Disparities between the Developed and the least Developed Areas of Romania. *LUMEN Proceedings*, 6(1), pp. 146-155.

[6] Burlacu, S., Bodislav, D. A., & Rădulescu, C. V. (2018). e-Commerce and Global Food Resources. Managerial Challenges of the Contemporary Society. *Proceedings*, 11(2), p. 48.

[7] Davis, D. R.., Epp, M. D., Riordan, H. D. (2004). Changes in USDA food composition data for 43 garden crops, 1950-1999, *Journal of the American College Nutrition*, 23/2004, pp. 669-682.

[8] Diamond, J. (2005). *Collapse: How Societies Choose to Fail or Succeed*. Viking Books, New York, ISBN 1-586-63863-7.

[9] Fukase, E., & Martin, W. (2020). Economic growth, convergence, and world food demand and supply. *World Development*, 132, 104954. https://doi.org/10.1016/j. worlddev.2020.104954.

[10] Jianu, I., Dobre, I., Bodislav, D. A., Radulescu, C. V., & Burlacu, S. (2019). The Implications of Institutional Specificities on the Income Inequalities Drivers in European Union. *Economic Computation and Economic Cybernetics Studies and Research*, 53(2), pp. 59-76.

[11] Jula, N., Jula, D. (2014). *Modelare economică. Modele econometrice şi de optimizare [Economic modelling. Econometric and optimization models]*, 8th edition, Mustang Publishing House, Bucharest.

[12] Kummer, C. (2010). The great grocery smackdown, *The Atlantic*.

[13] Low, S. A., & Vogel, S. (2011). Direct and intermediated marketing of local foods in the United States, USDA, *Economic Research Report*, nr. 128/2011.

[14] Mok, W. K., Tan, Y. X., & Chen, W. N. (2020). Technology innovations for food security in Singapore: A case study of future food systems for an increasingly natural resource-scarce world. Trends in Food Science and Technology, 102(May), pp. 155-168. https://doi.org/10.1016/j.tifs.2020.06.013.

[15] O'Dwyer, J. P. (2020). Stability Constrains How Populations Spread Risk in a Model of Food Exchange. *One Earth*, 2(3), pp. 269-283. https://doi.org/10.1016/j.oneear.2020. 02.016.

[16] Radulescu, C. V., Bodislav, D. A., & Burlacu, S. (2018). Demographic Explosion and IT Governance in Public Institutions. Managerial Challenges of the Contemporary Society. *Proceedings*, 11(1), p. 18.

[17] Schneider, U. A., Havlík, P., Schmid, E., Valin, H., Mosnier, A., Obersteiner, M., … Fritz, S. (2011). Impacts of population growth, economic development, and technical change on global food production and consumption. *Agricultural Systems*, 104(2), pp. 204-215. https://doi.org/10.1016/j.agsy.2010.11.003.

[18] Shukla, A. (2017). India to Be amongst most land scarce countries by 2050.

[19] Wilson, R. P., Neate, A., Holton, M. D., Shepard, E. L. C., Scantlebury, D. M., Lambertucci, S. A., … Marks, N. (2018). Luck in Food Finding Affects Individual Performance and Population Trajectories. *Current Biology*, 28(23), pp. 3871-3877.e5. https://doi.org/10.1016/j.cub.2018.10.034.

[20] Yang, G., Wang, H., Wang, L., & Shao, W. (2017). Analysis of the relationship between food production, water resources and power consumption in North China. Energy Procedia, 142, pp. 2574-2579. https://doi.org/10.1016/j.egypro.2017.12.094.

[21] Zarei, M. (2020). The water-energy-food nexus: A holistic approach for resource security in Iran, Iraq, and Turkey. Water-Energy Nexus, 3, pp. 81-94. https://doi.org/ 10.1016/j.wen.2020.05.004.