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IMPACT OF GENDER DIFFERENCES IN PERCEPTION OF CREATIVE IDENTITIES OF ARTIST, CREATOR, MANAGER, ENTREPRENEUR AND LEADER ON SUSTAINABILITY

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Abstract. Because personal identity is a crucial component forming an individual, the perception of identity is a key feature in identity work. As a crucial component of the constant development of an individual, identity work influences the sustainability of groups and societies. Due to gender differences in many areas, the research on the impact of gender factors on the perception of creative individuals (like an artist, creator, entrepreneur, leader, and manager) may bring significant conclusions. Although gender factor is widely present in the literature, there is a gap about the impact of gender on the perception of creative individuals. A quantitative examination among the international society representatives ($n = 160$) was undertaken to fill this gap. The research displays that male and female perspectives of the perception of the creative identities are statistically similar. The hypotheses were confirmed using the chi-square test of independence ($p < 0.001$). The additional qualitative analysis reveals that females, in comparison to males, see the particular factors constituting each studied identity slightly more transparent and as more important: the artist's identity by 1.73%, the creator's identity by 0.98%, the entrepreneur's identity by 2.23%, the leader's identity by 2.11%, and the manager's identity by 1.15%. The research results may be used to understand the gender differences of creative identities' perception by male- or female-dominated groups, organizations, and societies. The consequences of the differences for management and entrepreneurship may be seen as minor from the general perspective. However, they may be essential in the efficiency of the cooperation: 1) There is no evidence that any gender should be limited or preferred about working with creative individuals; 2) There is a slight difference indicating female predispositions in the perception of creative identities; 3) Particular features of creative individuals are underrated or overrated by males and females and can determine particular decisions. The research conclusions should be seen as a novelty compared to results describing essential differences in many areas of human activities regarding gender.

Keywords: gender; sustainability; identity; perception; creativity; artistry; entrepreneurship; leadership; organizing

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Additional disciplines: sociology, psychology, aesthetics, creativity

1. Introduction

Personal identity, being one of the basic foundations establishing an individual, is not an accessible area for researchers, primarily focusing on the managerial side of the problem and its organizational consequences. However, due to the strictly psychological characteristics of the research area (identity), management scientists, being weaker equipped in tools than psychologists, try to discover rules that can help include different identities in management practice. This philosophy was the initial point for this research.

Although external factors, like the social and intellectual background, primary material wealth, or just luck, affect the destiny of each person, it is the identity being the steering power behind the personal and professional lifecycle of an individual. The previous research in the area of artist's, creator's, entrepreneur's, leader's, and manager's identities found that even the persons who possess talent, personal characteristics, and well established professional position in the above areas, have problems with the definition of who an artist is, who a creative person is, who a manager is, who a leader is, or who an entrepreneur is. These blurred "definitions" of the particular identities led to separate the complex identities of artists-managers (Szostak & Sułkowski, 2020a, 2021b, 2020b) and artists-entrepreneurs (Szostak & Sułkowski, 2021a). Besides, while separating the creativity factor among these groups of individuals, it can be found that even the individuals with highly developed abilities allowing to describe their characteristics have many problems with the distinction between the creative and noncreative artist/manager/entrepreneur/leader.

Since one of the most fundamental variables in social research is gender, researchers look commonly for differences on this ground due to the common occurrence of this factor. The above considerations led to the comparison of the perception of the creative identities of an artist, creator, entrepreneur, leader, and manager by male and female representatives of the society may reveal additional conclusions to the issue of investigated identities, especially in the context of sustainability. As a result, the following two research hypotheses were established: H1) There are gender differences in perception of the artist's, creator's, entrepreneur's, leader's, and manager's identities. H2) Gender differences in perception of the artist's, creator's, entrepreneur's identity, leader's identity, and manager's identity are different, referring to each of the above identities.

Initially, secondary research in the form of reviewing literature and data was handled. The literature review approach is based on a qualitative selection of the literature taken from the following databases: EBSCO, Google Scholar, JSTOR, Mendeley, and Scopus. The methodological approach to the literature review based on an interdisciplinary and multi-paradigm tactic taking into account the publications from the areas of arts and aesthetics (artist's identity), creativity (creative person's identity), management (manager's identity), entrepreneurship (entrepreneur's identity), leadership (leader's identity), and psychology (gender differences in perception). The literature review was run using the NVivo Pro software. Secondly, quantitative research was conducted.

2. Literature review

The literature presents various kinds of identities. The rudimentary division of identities is about individual and group, e.g., personal identity (Bridgstock, 2012; Samuel & Kanji, 2020; Zambrell, 2016) versus group identity (McHugh, 2015; Postuła & Majczyk, 2018; Vincent & Kouchaki, 2016) or collective identity (Brown, 2019; Carroll & Levy, 2008; Voss et al., 2006; Yuan & Li, 2019). Adding the optics of culture, a social identity (McNeill & Venter, 2019; Sethi et al., 2012) and national identity (Grigoryan & Kotova, 2018; Saavedra Llamas & Grijalba de la Calle, 2020) can be revealed. Adding the organization optics, we will get an organizational identity (Erat et al., 2020) or identity integration (Brown, 2019; Tendayi Viki & Williams, 2014). Other distinction focuses on the area of individual's activities, revealing, e.g., a professional identity (Carroll & Levy, 2008; Kunrath et al., 2020; Schediwy et al., 2018; Zocche et al., 2018). Adding ethics optics, we can define a moral identity (Gerpott et al., 2019). Looking through a market lens, we will find a brand identity (Szczepaniak, 2018).

Taking into consideration a processual approach, we can find a developing identity (Yazar & Arifoglu, 2012), established identity (Erat et al., 2020), sustainable identity (McNeill & Venter, 2019), and identity work (Bennett & Hennekam, 2018; Reedy, 2008). Researchers also found the aspect of the structure of the identity revealing identity construction (Watson, 2009; Zambrell, 2016), relations between relational identity (Brewer & Gardner, 1996), as well as identity adaptation or creation (Warhurst, 2011). If we take identity as an organization's resource, we may say about identity management strategies (Grigoryan & Kotova, 2018) or a narrative identity (Gray et al., 2015; Sveningsson & Alvesson, 2003; Wolf, 2019) helping managers to reach particular goals. Researchers also found particular identity types, e.g., creative identity (Vincent & Kouchaki, 2016) or dialogical identity (Masso, 2010). Referring to the creative identity, we need to mention the distinction made by aesthetics based on artists' characteristics, i.e. basic personality and creative personality (Gołaszewska, 1984; Szostak, 2020a; Szostak & Sułkowski, 2020a). Finally, depending on the complexity, we can have a simple (separate) identity, e.g. manager's identity (Carroll & Levy, 2008; Hallier, 2004; Watson, 2009), artist's identity (Dahlsen, 2015; Deresiewicz, 2015, 2020; Tatarkiewicz, 2015), or a complex identity, e.g. artist-manager's identity (Degot, 2007; Szostak & Sułkowski, 2020a, 2021b; Walter, 2015).

As we see from the above, identity seems to be a multidimensional issue. Its perception is not straightforward nor undisputable; the dissimilarities, both in the fields of identity and perception, lead to the assumption that the problem may be fogged. Researchers in the area of management explored this problem on example of particular groups: designers (Kunrath et al., 2020), managers (Erat et al., 2020; Hallier, 2004), actors (Walter, 2015), nations (Grigoryan & Kotova, 2018), mixed-race individuals (Tendayi Viki & Williams, 2014), children (Yazar & Arifoglu, 2012), students (Naderi et al., 2009), creative people (Vincent & Kouchaki, 2016). Fascinating insight into the problem consists of sources of inspiration and motifs of undertaking creative activities (Szostak, 2018).

Investigators emphasize that perception has its boundaries prompting the perception process, e.g., perceptive capabilities of individuals (Wimschneider & Brem, 2019), conditions of the perception itself (Schielke, 2020), or cultural aspects affecting the manner of perception (Saavedra Llamas & Grijalba de la Calle, 2020). In this situation, due to the complication of the problem, it is primarily unachievable to get a straightforward response to how a specific identity is perceived. However, trying to catalog how researchers handled the challenge of perception of a specific identity, we can suppose that: 1) They limit the issue of the research from general, widely defined identity into a particular type of identity, e.g., the identity of nurse manager responsibilities (Baker et al., 2012), identity of project manager (Lutas et al., 2020); 2) They judiciously chose the group perceiving the particular identity, e.g., teachers (Kasmaiezhadfar et al., 2015), designers (Kunrath et al., 2020), nurses (Kiran et al., 2019; Raso et al., 2020), purchasers of specific goods or services (Horn & Salvendy, 2009), undergraduate business students (Kohail et al., 2016); or 3) They examine the problem in contrast of two investigation units, e.g., artists and non-artists (Bhattacharya & Petsche, 2002).

The distinction in the perception of particular identity due to gender differences is present in the literature in the broad spectrum (Casey, 2021; Hancock et al., 2020). The gender lens was qualitatively analyzed mainly based on the identities of particular figures, e.g., two Swedish artists, Fredrik Ekelund and Rodrigo Bernal (Lindholm, 2015), diaries of Mary Seton Watts (Rose, 2017), actor's identity as a manager (Walter, 2015). It can be said that mainly the 19th-century arts are deeply analyzed areas in the contexts of perception and gender. Considering the current art world and current artists, it can be found research on gender differences in perception of, e.g., graffiti works and their creators (Chinangure & Mapaire, 2019) or punk musicians (Garrigós, 2017). The more general approach to artist's identity through gender lens reveals conclusions about differences in career-decision making and self-management by artists (Bennett & Hennekam, 2018; Hennekam & Bennett, 2016), differences in perception of paintings as the way of consideration of the effective communication (Abodunrin, 2017), differences in identification of the cultural attitudes by art beholders in the auction context (Adams et al., 2017), inequality in artistic careers based on gender and artist archetypes (Miller, 2016), differences in music perception (Shakespeare et al., 2020; Szostak, 2020b).

Due to the uneasy task of defining a creator's identity, the gender lens was rarely analyzed in the context of the creator's identity. It can be said that literature, in general, mixes the areas of arts and creativity. Despite these limitations, researchers focused on the gender differences in the area of the sense of success and well-being of a creator (Lebuda & Csikszentmihalyi, 2020). analysis of particular cases of creative identities working and/or living together and catalyzing their creativity (Thomas, 2019).

The literature about an entrepreneur's identity with the gender lens is broad. There are researches describing differences in the area of venture creation and opportunity exploitation (Baliyan et al., 2020; Duygu Seckin & Tutku Seckin, 2019; Lewis et al., 2016; Rambe & Ndofirepi, 2017), motives of venture creation and involvement (Kharlamova & Stavitskiy, 2020; Mungai & Ogot, 2012; Orser et al., 2012), entrepreneurship competence and entrepreneurial intentions (Daliman et al., 2019), or even fear of failure or danger in the venture establishing (Bullough & Renko, 2017; Daoud et al., 2020). Researchers have been looking for conclusions taking into consideration particular grounds for entrepreneurship, e.g. teachers (Tican, 2019), all types of university students (Brijlal, 2011; Daliman et al., 2019; de la Cruz Sánchez-Escobedo et al., 2011; Vázquez-Parra et al., 2020), nursing students (Atasoy & Aktaş, 2020), STEM disciplines, i.e., Science, Technology, Engineering, Mathematics (Elliott et al., 2020), Higher Educational Institutions (Bergmann et al., 2018). The research is done in particular nationality groups, e.g., Afghanistan (Bullough & Renko, 2017), Germany (Bergmann et al., 2018), Indonesia (Daliman et al., 2019), Kenya (Mungai & Ogot, 2012), Spain (de la Cruz Sánchez-Escobedo et al., 2011), Turkey (Duygu Seckin & Tutku Seckin, 2019), Zimbabwe (Rambe & Ndofirepi, 2017) or in international perspective: African (Brijlal, 2011), European (Tonoyan et al., 2020) or global (Fernández-Laviada et al., 2020). We can find a clear distinction between individual (Tican, 2019) and group/social entrepreneurship (Vázquez-Parra et al., 2020) in the literature.

The leader's identity with the gender lens has been analyzed in many dimensions. The research was done based on particular nationalities, e.g., China (Chen, 2018), France (Saint-Michel, 2018), India (Datta & Agarwal, 2017; Reutzel et al., 2018), Indonesia (Hudson et al., 2020), sub-Saharan Africa (Moorosi, 2020), South Africa (Bornman, 2019; Herbst, 2020), the U.S. (Ko et al., 2015; Peachey & Burton, 2011; Yun et al., 2020) or in the intra-national perspective. Researchers used the following approaches in area of leader's identity: gender and leader's effectiveness (Collica-Cox & Schulz, 2020; Ko et al., 2015; Rhee & Sigler, 2015), gender and the pursuit of innovation opportunities (Reutzel et al., 2018), gender and leadership style (Bornman, 2019; Brands et al., 2015; Rhee & Sigler, 2015), gender and communication style (Violanti & Jurczak, 2011), gender and errors/mistakes (Thoroughgood et al., 2013), gender and external audience response to organizational failures (Montgomery & Cowen, 2020), gender and stereotypes and prejudices (Parker et al., 2020; Rhee & Sigler, 2015; Saint-Michel, 2018), gender and looking for help (Rosette et al., 2015), gender and narcissism (Chen, 2018), gender and leader's behavior and emotions (Schreiner et al., 2018; Yun et al., 2020), gender and behavioural integrity (Gatling et al., 2020), gender and personal and professional identity transitions (Meister et al., 2017), gender and conflict (Veldman et al., 2017). The tests were made in particular industries, e.g., film (Parker et al., 2020), non-profit organization (Schreiner et al., 2018), police (Veldman et al., 2017), political parties (Butler & Preece, 2016), restaurant (Gatling et al., 2020), university (Herbst, 2020; Yun et al., 2020), or in a cross-industrial manner (Chen, 2018; Collica-Cox & Schulz, 2020; Ko et al., 2015; Saint-Michel, 2018). We should also underline that perception of a leader's identity is investigated by the analysis of followers (Schreiner et al., 2018; Thoroughgood et al., 2013), by the perception by other leaders (Peachey & Burton, 2011), or by self-perception (Lee, 2020; Moorosi, 2020).

The manager's identity with the gender lens has been analyzed about many of the problems mentioned above. Trying to describe the literature about pure manager's identity in comparison to gender perception, we can find research about differences in manager's behavior (Dennis & Kunkel, 2004), role identity and gender management characteristics (Tzinerr & Barsheshet-Picke, 2014), differences in creativity (Ahmad & Zadeh, 2016; Chusmir & Koberg, 1986), emotional intelligence (Ahmad & Zadeh, 2016), a work-family conflict (Aaltion & Huang, 2007), creating an unseen psychological bias and approach to conflicts (Rai, 2018), promotion possibilities (Chow & Crawford, 2004; Shung-King et al., 2018). The mentioned studies were undertaken based on particular nationali-

ties, e.g., China (Aaltion & Huang, 2007), India (Rai, 2018), Pakistan (Ahmad & Zadeh, 2016), South Africa (Bornman, 2019; Shung-King et al., 2018), the U.K. (Chow & Crawford, 2004; Rosewell & Ashwin, 2019), the U.S. (Chow & Crawford, 2004), or from the international perspective (Szostak & Sułkowski, 2021b). We can also distinguish studies based on a particular industry, e.g., academics (Rosewell & Ashwin, 2019), arts (Szostak & Sułkowski, 2021b), health (Shung-King et al., 2018), IT (Aaltion & Huang, 2007), students (Bornman, 2019), or cross-industrial.

Although gender factor is present in the mentioned literature, we will not find any information about the impact of gender on the perception of creative individuals. Therefore, approaching this issue from the social capital theory and underlining the importance of creative individuals for the sustainable development of groups, organizations, and societies, a gap in the literature can be defined.

3. Research objective and methodology

The following research questions should be formulated to tackle the literature gap problem: RQ1) Does gender influence the creative identities perception? RQ2) Which creative identities are perceived similarly and which differ depending on gender? RQ3) Is it possible to formulate any conclusions about gender differences in the perception of creative individuals and investigate potential consequences for management, entrepreneurship, and sustainability?

The tool for quantitative research in the form of a questionnaire was established based on the approach of Stefan Nowak (2007), containing the dimensions of the studied phenomenon and then selecting indicators that allow describing the studied phenomenon. The initial methodological idea assumed constructing separate sets of indicators for each of the analyzed dimensions. Sets of indicators for individual dimensions began to be developed based on the literature on the subject in the field of: artistry (Bayrakci et al., 2009; McHugh, 2015; Szostak, 2020; Walter, 2015; Wilson & Brown, 2012; Woodward & Funk, 2010), creativity (Dufour et al., 2020; Gangi, 2018; Lehmann & Gaskins, 2019; Leso et al., 2017; Szostak & Sułkowski, 2020; Taleghani, 2012; Zhou et al., 2008), managerial issues (Baker et al., 2012; Bulei et al., 2014; Elstad & Jansson, 2020; Hallier, 2004; Hatch et al., 2006; Hracs, 2015; Lähdesmäki, 2012; López-Fernández et al., 2018; Lutas et al., 2020), leadership (Adler, 2006; Alvesson & Blom, 2015; Carroll & Levy, 2008; Jankurová et al., 2017; Lord & Brown, 2001; Nikolski, 2015; Postuła & Majczyk, 2018; Raso et al., 2020; Stuke, 2013; Woodward & Funk, 2010), and entrepreneurship (Bureau & Zander, 2014; Cardon et al., 2009; Clarke & Holt, 2019; Damásio & Bicacro, 2017; Davidsson, 2006; Enhuber, 2014; Lewis et al., 2016; Postuła & Majczyk, 2018; Toscher, 2019, 2020). However, the analysis of individual groups of indicators showed that, in principle, each of the indicators selected for individual dimensions might be used to describe each of the examined dimensions. Following this assumption, a single list of 50 of the same indicators was compiled and applied to all five examined dimensions. Thanks to this, the obtained results may be compared to the same indicators for other dimensions.

The survey was ultimately split into four segments. In the first segment, a list of questions (each question related to one indicator) was divided into thematic units referring to each analyzed dimension: artistry, creativity, entrepreneurship, leadership, and managerial issues. All questions were closed, and a five-point Likert scale was formed to answer: *definitely not*, *rather not*, *hard to say*, *rather yes*, and *definitely yes*. In the second segment of the investigation, questions were asked about the relationship of each of the analyzed dimensions to the other dimensions. In the third segment, the respondents described their identity concerning each of the dimensions. Finally, the fourth segment included questions categorizing the respondents, i.e., gender, age, education, their assessment of their own identity (as an artist, creator, entrepreneur, leader, and/or manager).

The nonparametric chi-square test of independence dedicated to small samples that do not have a normal distribution was used to verify the hypotheses. The pairs of the observed values were compared with pairs of the expected

values for each hypothesis. The p-value of the tests was < 0.001 . Data analysis was executed using IBM SPSS and MS Excel. Due to the small size of the sample, complex statistics were not conducted. Therefore, this article exhibits only a number of the conclusions from the entire investigation (Szostak, 2021).

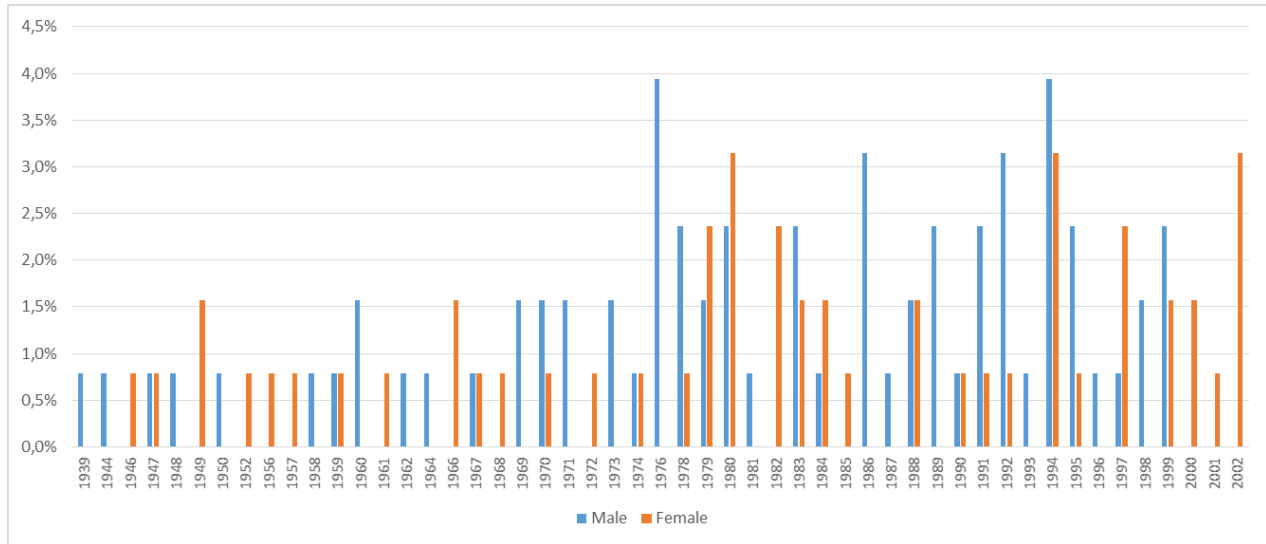


Figure 1. The age of the research participants according to gender

Source: Author's elaboration

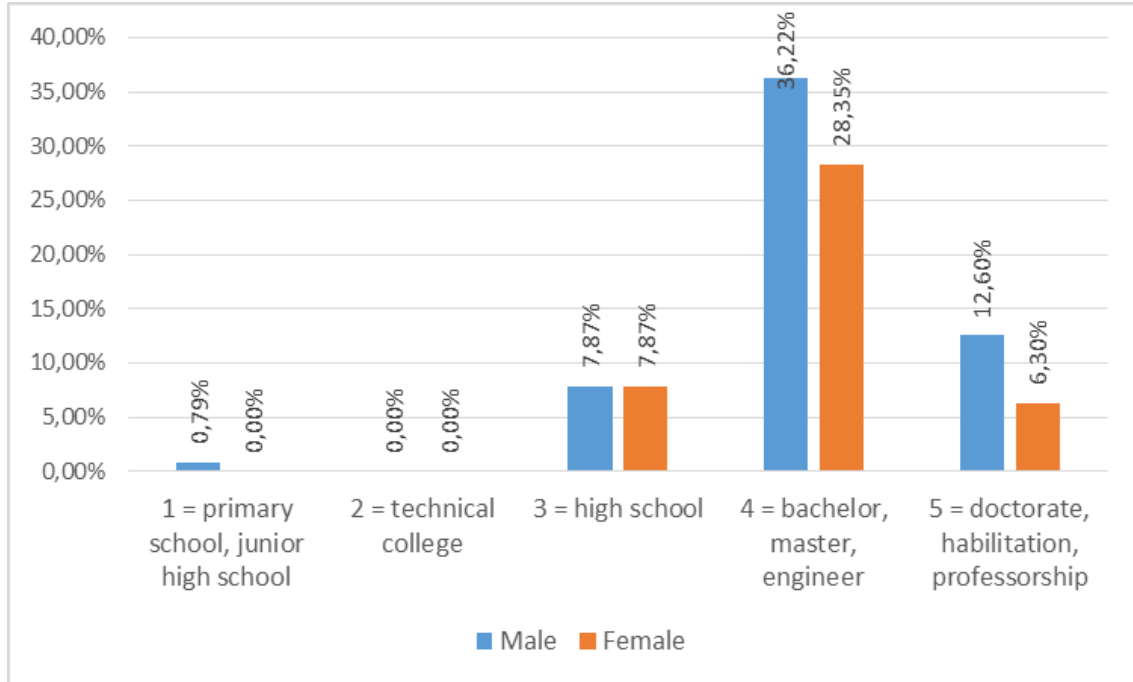


Figure 2. The education level of the research participants according to gender

Source: Author's elaboration

The survey entitled "Perception of creativity, artistry, entrepreneurship, leadership and managerial abilities" lasted 34 days, i.e., from 20th December 2020 to 23rd January 2021. Two identical questionnaires, one in English and the other in Polish, were distributed via direct contact (sending requests to participate in the survey to friends of people) and using indirect public tools (social networks, collective messages to various types of communities); The estimation of the number of people asked to take part in the study is of approximately 2-3 thousand. Eight hundred seventy-nine people were interested in taking part in the survey, which we judge by clicking on the link leading to the survey. The actual participation in the study, consisting of filling in the questionnaire, was attended by 160 people, i.e., 18.2% of people interested in taking part in the research. The average time spent filling in the questionnaire was 32 minutes and 23 seconds, and the average age of the respondent was 38 years. Among the respondents: women constituted 42.5% and men 57.5% – see Figure 1; people with higher education (bachelor, master, engineer) 64.57%, people with doctoral, postdoctoral, or professor degrees 18.90%, people with secondary education 15.75% – see Figure 2. The respondents came from 28 countries; however, because the distribution of this feature was very diverse, we divided the sample into possibly equivalent crops in this respect, i.e., 74% developed countries and 26% developing countries (United Nations, 2021); European countries 71.7%, and non-European countries 28.3%; Poland 49.6% and other countries 50.4%; post-communist countries 63.8% and countries with no experience of communism 36.2%.

4. Results and discussion

Discussing each research hypothesis separately, from the statistical point of view, it can be said that:

H1 (There are gender differences in perception of the artist's, creator's, entrepreneur's, leader's, and manager's identities) is verified negatively. The *chi-square* value amounted to 395.7864175 for an artist, 391.3352945 for a creator, 409.46 for an entrepreneur, 413.44 for a leader, and 407.31 for a manager. For the $df = 49$, using the chi-square distribution table, we get the value of 85.3506. It means that the results are statistically significant for the significance level of $p = 0.001$.

H2 (Gender differences in perception of the artist's, creator's, entrepreneur's, leader's, and manager's identities are different referring to each of the above identities) is verified negatively. The *chi-square* value = 461.15. For the $df = 49$, using the chi-square distribution table, we got the value of 85.3506. It means that the results are statistically significant for the significance level of $p = 0.001$.

Although the primary hypotheses were statistically verified negatively, the analysis of the detailed characteristics of the research identities referring to gender reveals interesting results.

4.1. Artist's Identity

Based on the research, there are the following gender differences in the perception of the artist's identity. The ten features of an artist seen as more important to females than to males are (in decreasing gradation order): individualism, sensitivity to Truth, justice, ability to set goals, interpersonal skills (communicativeness, reading emotions, sensitivity to others), innovation, sensitivity to Good, courage, efficiency and self-confidence (the mean of these ten differences is 4.56%). The ten features of an artist seen as more important to males than to females are (in increasing gradation order): resistance to fails and failures, improving quality through repetition, being guided by faith and spirituality, focusing on financial profit, being guided by emotions, disorder, mess, chaos, randomness in action, focusing on creating added (non-financial) value, a tendency to plan, ability to focus on details, and an inner sense of control (the mean of these ten differences is 0.95%). (see Figure 3 and Figure 4).

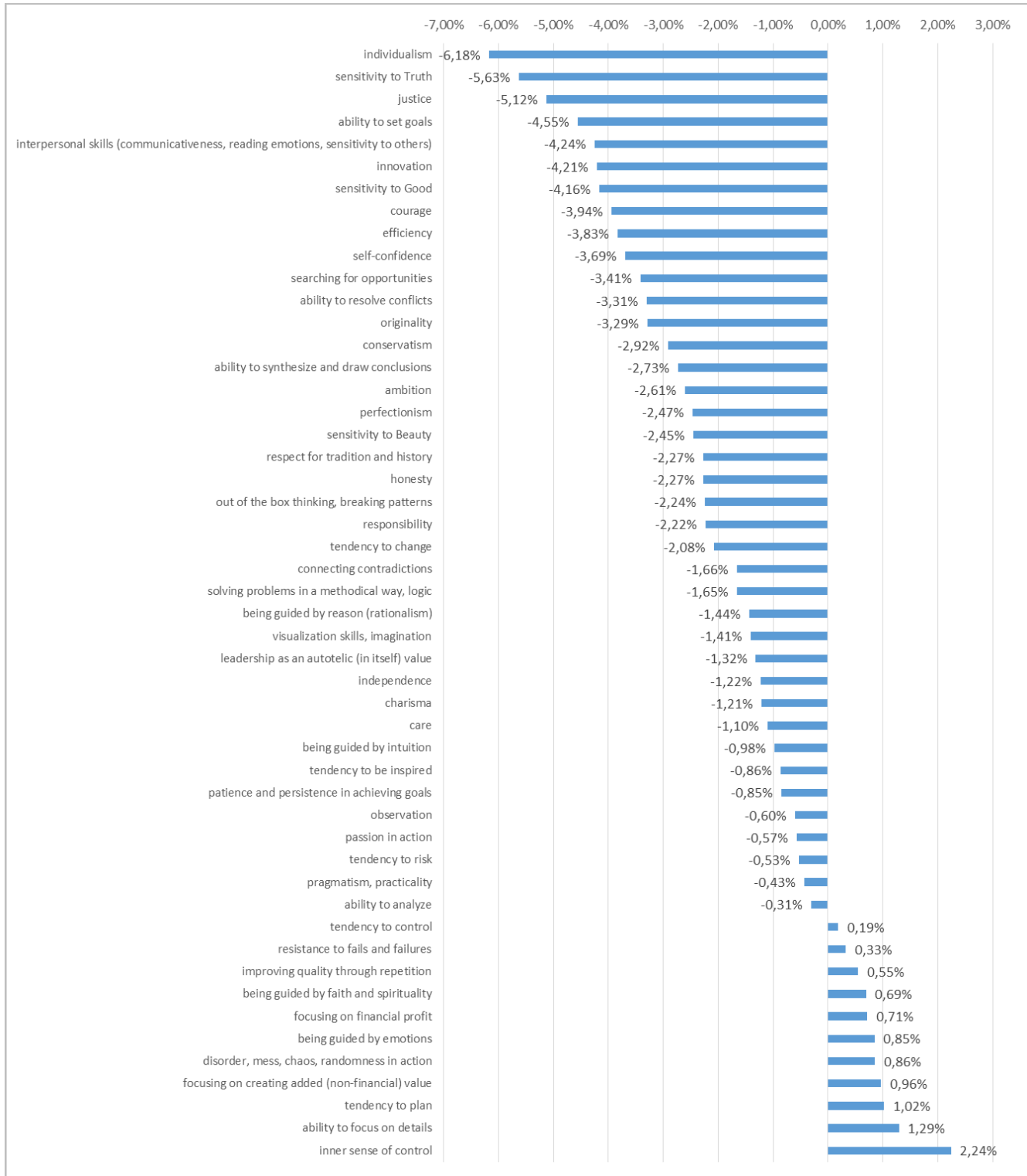


Figure 3. Gender differences in perception of an artist (male to female perspective)

Source: Author's elaboration

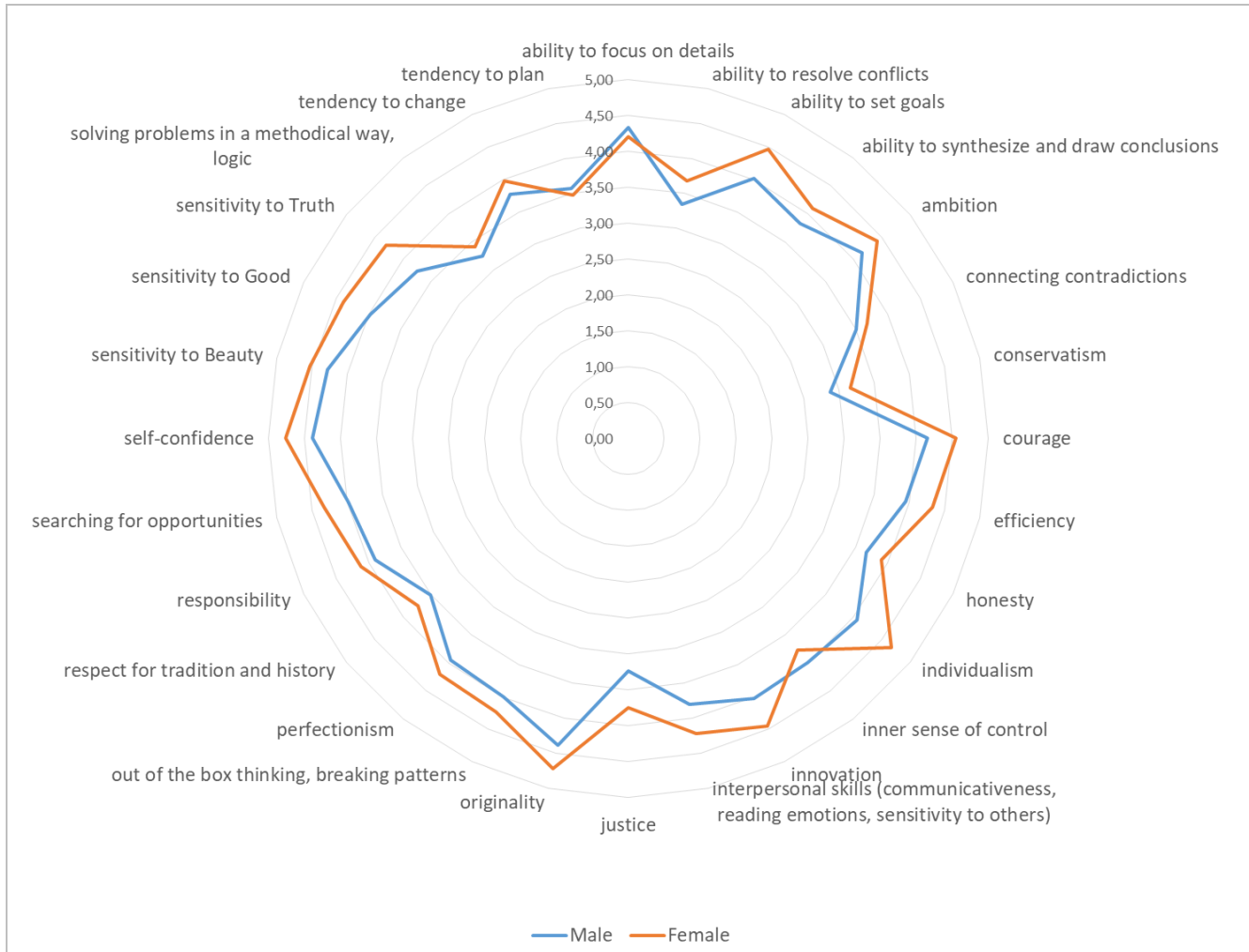


Figure 4. The most significant gender differences in perception of an artist

Source: Author's elaboration

4.2. Creator's Identity

The following gender differences in the perception of the creator's identity can be described. The ten features of a creator seen as more important to females than to males are (in decreasing gradation order): individualism, charisma, justice, self-confidence, sensitivity to Truth, ability to set goals, passion in action, observation, interpersonal skills (communicativeness, reading emotions, sensitivity to others), respect for tradition and history (the mean of these ten differences is 3.45%). The ten features of a creator seen as more important to males than to females are (in increasing gradation order): focusing on creating added (non-financial) value, inner sense of control, tendency to control, being guided by emotions, ability to focus on details, connecting contradictions, care, improving quality through repetition, focusing on financial profit, disorder, mess, chaos, and randomness in action (the mean of these ten differences is 1.86%) (see Figure 5 and Figure 6).

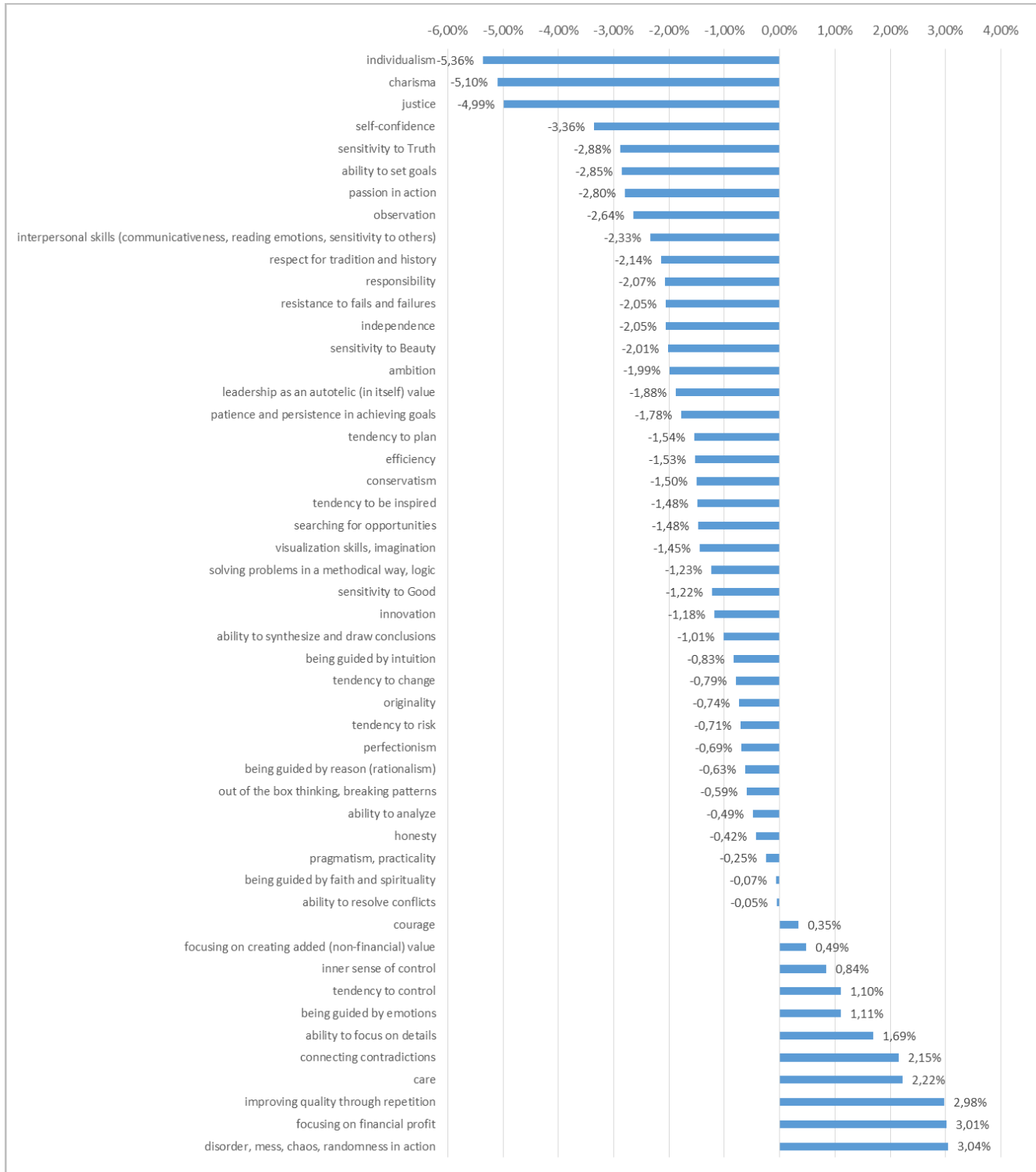


Figure 5. Gender differences in perception of a creator (male to female perspective)

Source: Author's elaboration

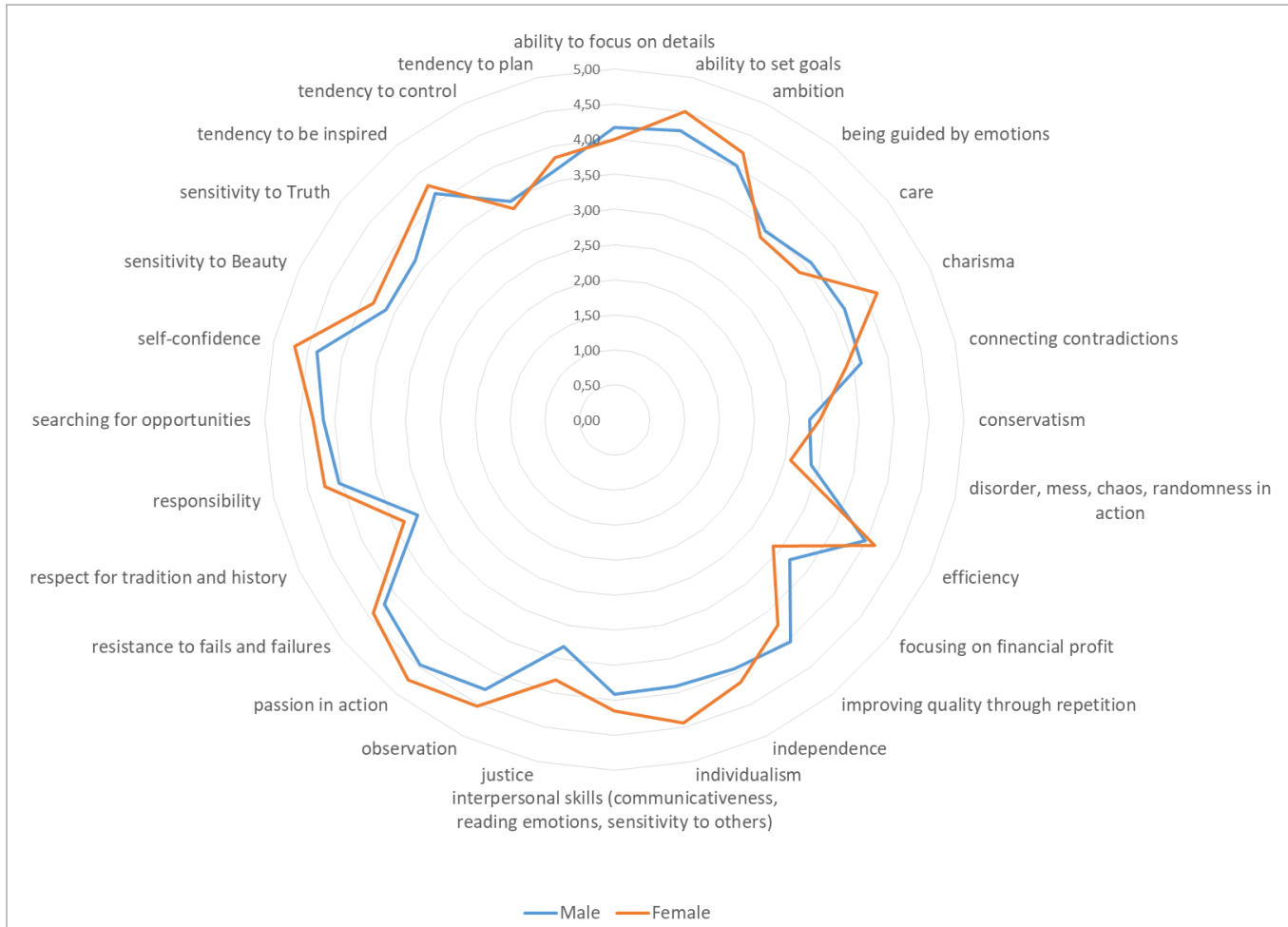


Figure 6. The most significant gender differences in perception of a creator

Source: Author's elaboration

4.3. Entrepreneur's Identity

The following gender differences in the perception of the entrepreneur's identity may be revealed. The ten features of an entrepreneur seen as more important to females than to males are (in decreasing gradation order): justice, sensitivity to Truth, honesty, respect for tradition and history, conservatism, sensitivity to Good, perfectionism, sensitivity to Beauty, ability to synthesize and draw conclusions, leadership as an autotelic (in itself) value (the mean of these ten differences is 5.34%). Only four features of an entrepreneur are seen as more important to males than to females; they are (in increasing gradation order): ambition, innovation, a tendency to risk, and charisma (the mean of these four differences is 0.88%). Justice was described as the most differently perceived feature among all (8.43%) researched features of all creative identities. Adding the following illustrated features, i.e., sensitivity to Truth and honesty, it can be concluded that men are more cynic than women in undertaking entrepreneurial activities (see Figure 7 and Figure 8).

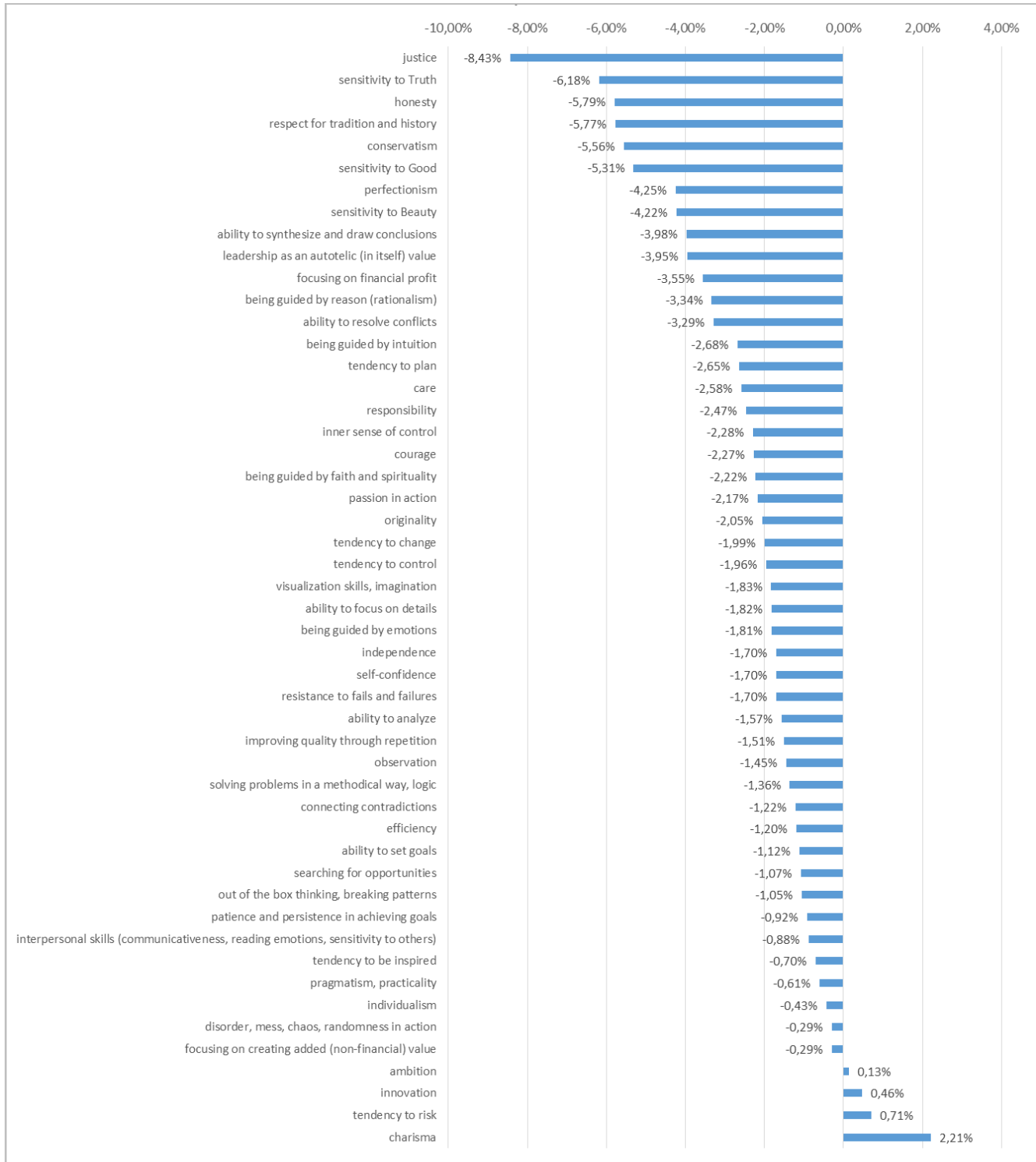


Figure 7. Gender differences in perception of an entrepreneur (male to female perspective)

Source: Author's elaboration

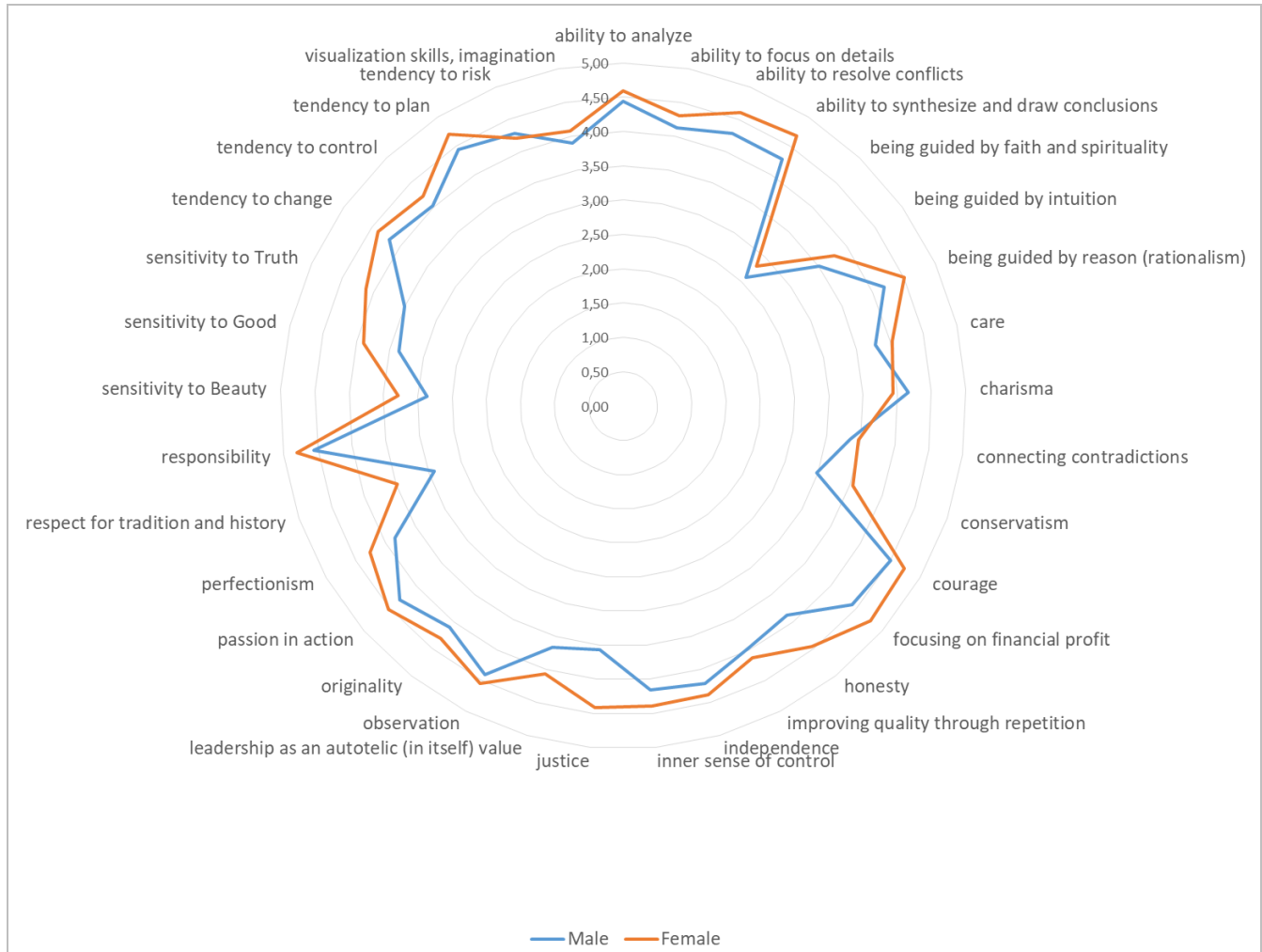


Figure 8. The most significant gender differences in perception of an entrepreneur

Source: Author's elaboration

4.4. Leader's Identity

The following gender differences in the perception of the leader's identity can be found. The ten features of a leader seen as more important to females than to males are (in decreasing gradation order): leadership as an autotelic (in itself) value, originality, passion in action, sensitivity to Good, sensitivity to Truth, justice, visualization skills and imagination, connecting contradictions, innovation, and perfectionism (the mean of these ten differences is 4.75%). There are only six features of a leader seen as more important to males than to females; they are (in increasing gradation order): being guided by intuition, care, being guided by faith and spirituality, disorder (mess, chaos, randomness) in action, improving quality through repetition, and being guided by emotions (the mean of these six differences is 0.95%) (Figure 9 and Figure 10).

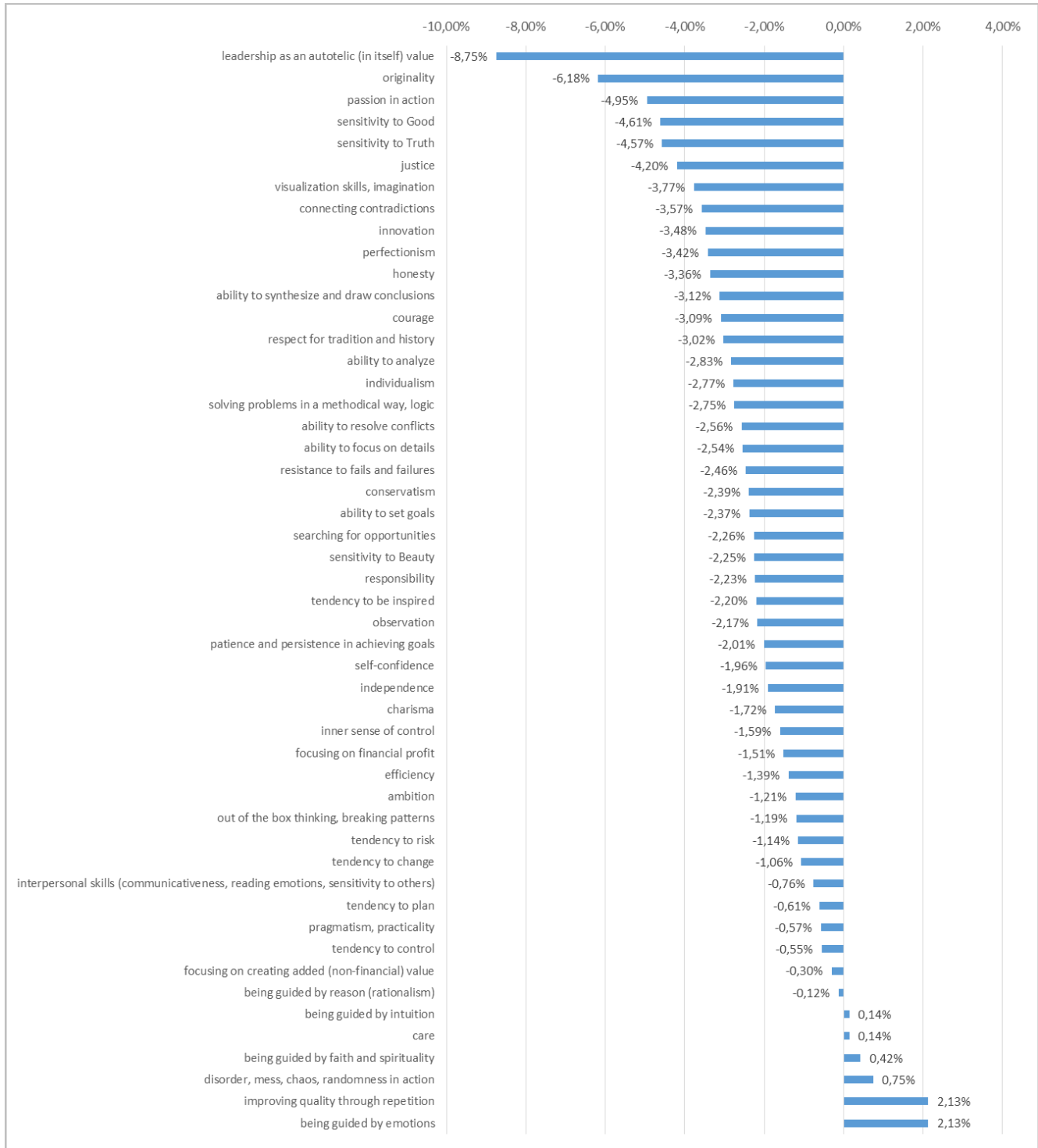


Figure 9. Gender differences in perception of a leader (male to female perspective)

Source: Author's elaboration

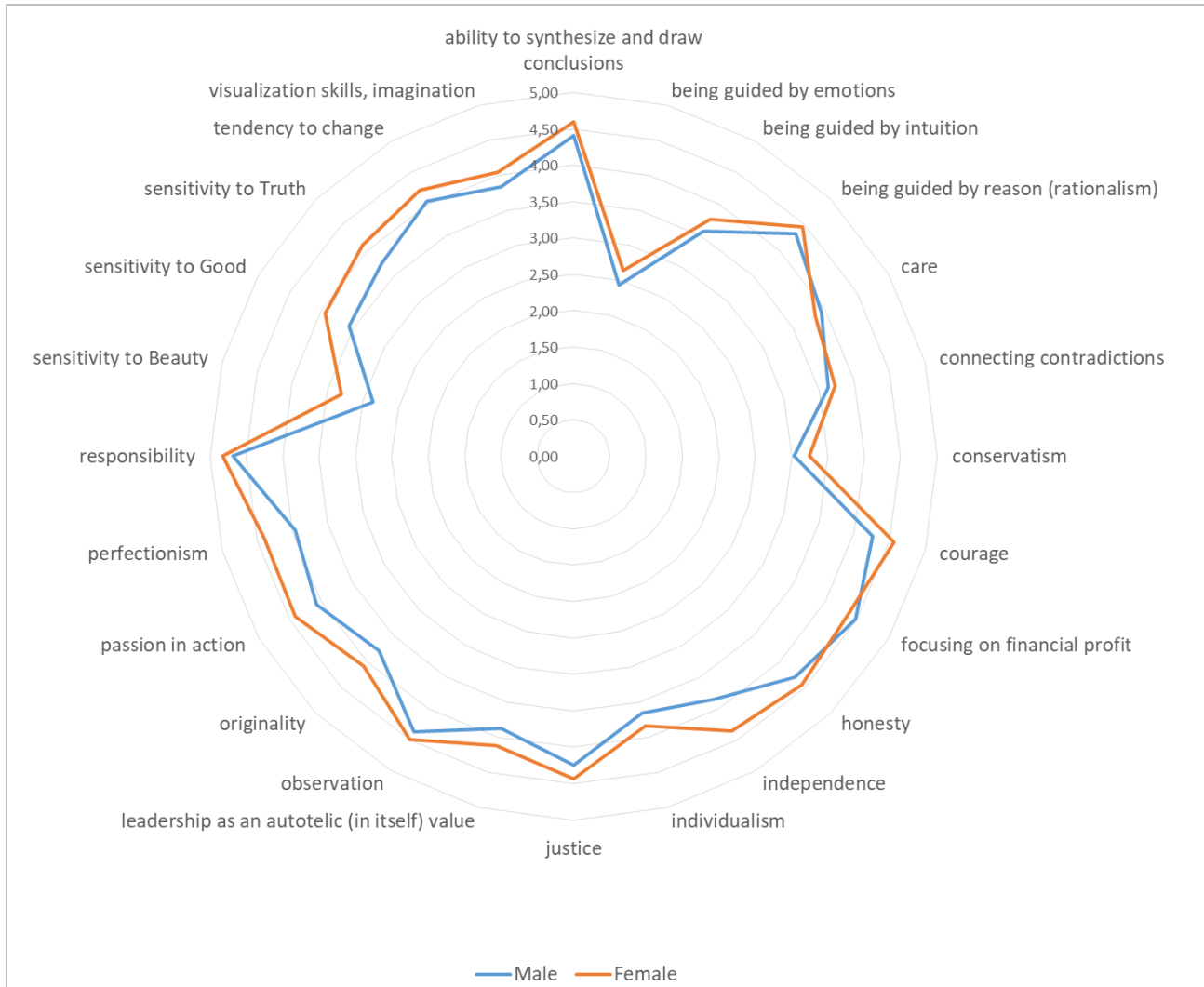


Figure 10. The most significant gender differences in perception of a leader

Source: Author's elaboration

4.5. Manager's Identity

The following gender differences in the perception of the manager's identity may be described. First, the ten features of a manager seen as more important to females than to males are (in decreasing gradation order): independence, sensitivity to Beauty, perfectionism, sensitivity to Good, sensitivity to Truth, passion in action, courage, originality, leadership as an autotelic (in itself) value, and conservatism (the mean of these ten differences is 3.53%). Second, the ten features of a manager seen as more important to males than to females are (in increasing gradation order): interpersonal skills (communicativeness, reading emotions, sensitivity to others), efficiency, charisma, improving quality through repetition, tendency to control, pragmatism (practicality), patience and persistence in achieving goals, care, a tendency to plan, and focusing on financial profit (the mean of these ten differences is 0.68%) (see Figure 11 and Figure 12).

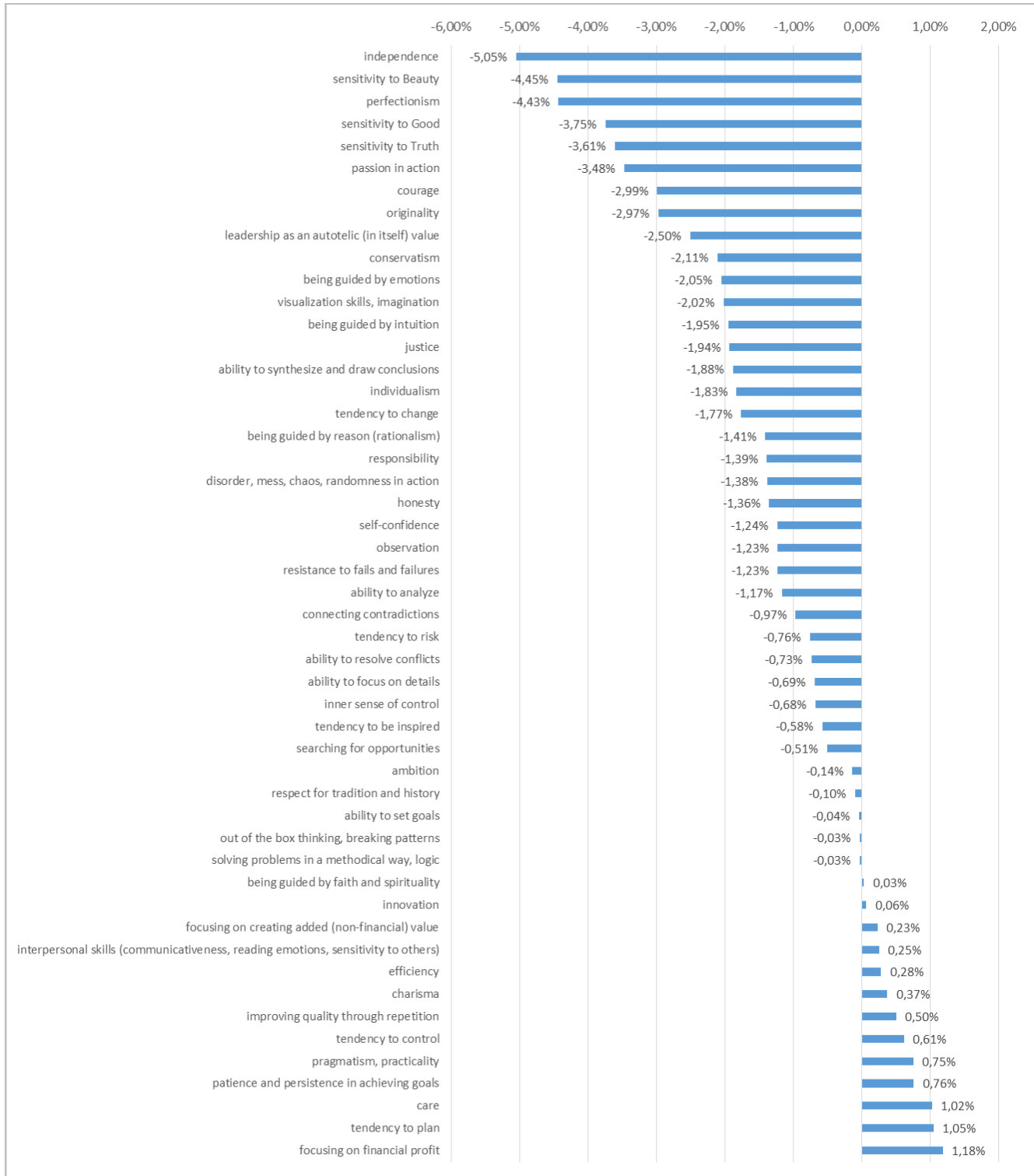


Figure 11. Gender differences in perception of a manager (male to female perspective)

Source: Author's elaboration

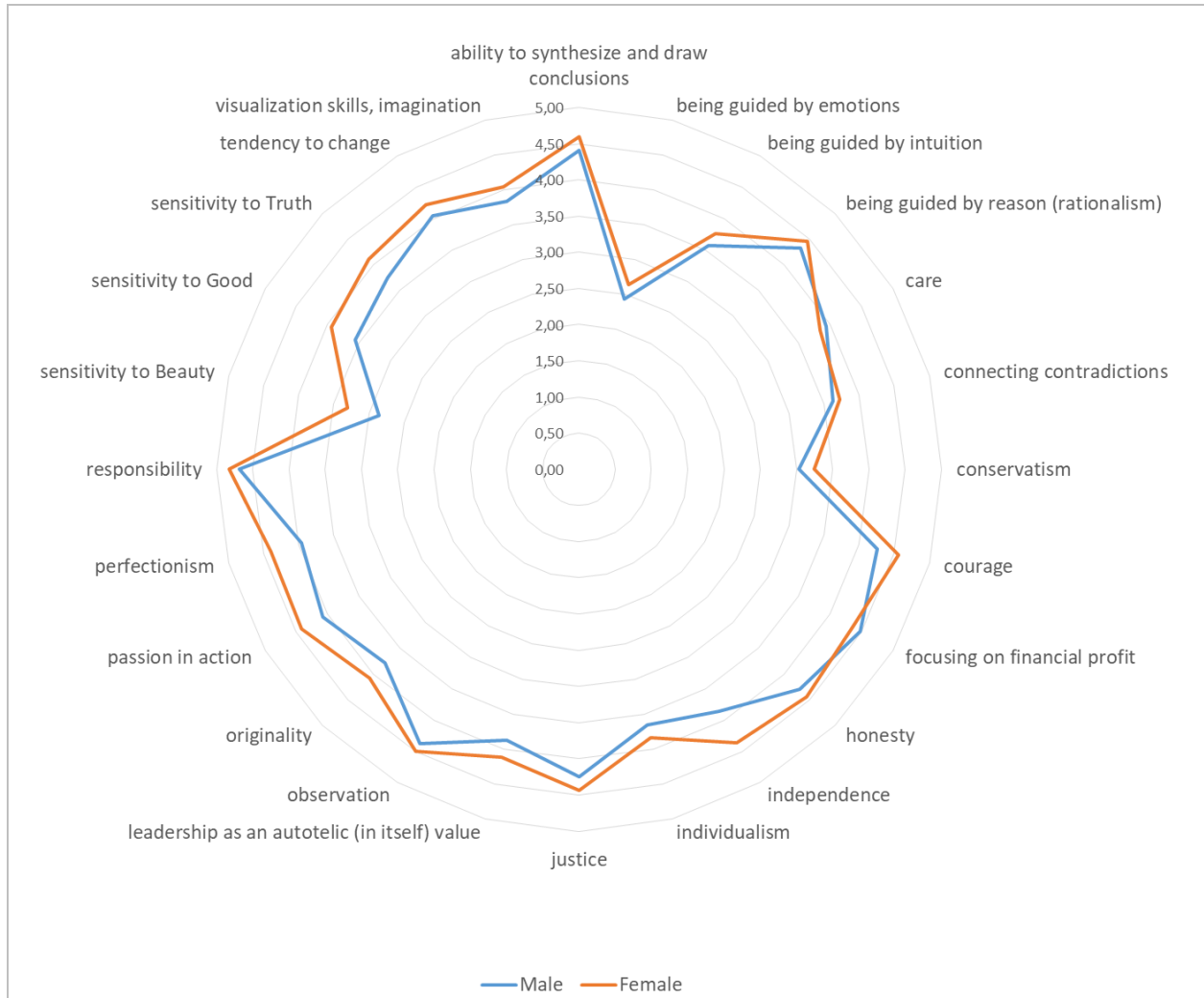


Figure 12. The most significant gender differences in perception of a manager

Source: Author's elaboration

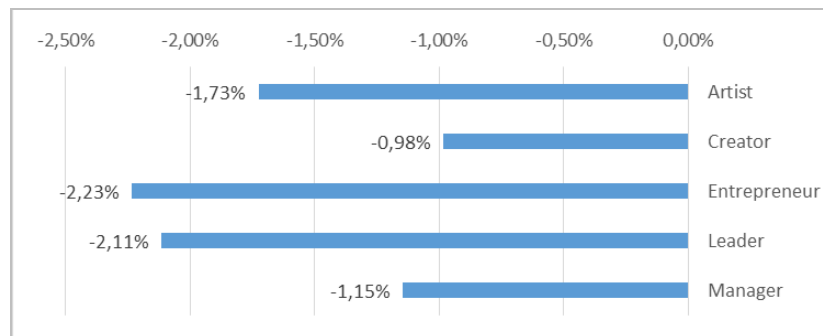


Figure 13. The mean of gender differences in perception of an artist, creator, entrepreneur, leader, and manager (male to female perspective)

Source: Author's elaboration

The qualitative gender differences between the perception of the creative identities of artist, creator, entrepreneur, leader, and manager show that females see the particular factors constituting each studied identity more clearly and as more critical in comparison to males: the artist's identity by 1.73%, the creator's identity by 0.98%, the entrepreneur's identity by 2.23%, the leader's identity by 2.11%, and the manager's identity by 1.15%. The synthetic visualization of means of perception of all features about the artist's, creator's, entrepreneur's, leader's, and manager's identity in gender perspective shows Figure 13.

5. Conclusions

The following issues raised in the research questions may be determined. RQ1: From the statistical perspective, gender does not influence the creative identities' (of an artist, creator, entrepreneur, leader, manager) perception. Although, qualitative analysis of certain factors constituting creative identities reveals that the differences may reach approximately 8-9% maximally. RQ2: The identity of a creator (a difference of 0.98%) and a manager (1.15%) are perceived similarly depending on gender. The largest, but still very modest (less than 2.5%), differences in perception refer to an entrepreneur (2.23) and a leader (2.11%). RQ3: Depends on dominant features among a group of people – e.g., sensitivity to justice in case of entrepreneur's identity or approach to individualism in case of artist's and creator's identity – the gender structure of the group may influence the quality of cooperation and the effects of interaction. The consequences of these individual differences for management and entrepreneurship may be seen as minor from the general perspective. However, in the case of individual situations, they may play an essential role in the efficiency of the cooperation. In the context of sustainability, the research may be concluded in three directions. Firstly, there is no evidence that any gender should be limited or preferred about working with creative individuals. Secondly, there is a slight difference indicating female predispositions in the perception of these identities. Thirdly, the above qualitative analysis shows that particular features are underrated or overrated by males and females and can determine particular decisions. All these conclusions should be kept in mind while focusing on creating patterns and environments for the sustainable development of groups, organizations, and societies. The research conclusions should be seen as a novelty compared to results describing essential differences in many areas of human activities regarding gender.

Among the limitations of the research, we should underline the following elements: 1) The research was run during the first deep phase of the COVID-19 pandemic that could influence respondents' views and opinions; 2) The research sample (n = 160) was relatively small in comparison to the analyzed problem; 3) Synthetic conclusions can be not widely representative due to complexity of the research problem; 4) Because more than 90% of respondents possess at least higher degree of education – these people are statistically better equipped with knowledge and perception tools than less educated individuals –our conclusions should not be extended on the whole society.

The results of the research may be helpful for: 1) Creative individuals (artists, creators, entrepreneurs, leaders, managers) for a) better understanding the different layers of their personality with underlining the issue of complex identity and gender differences, b) comparison of own identity with the general perception of a particular role about gender differences; 2) Researchers wanting to investigate the similarities and differences between identity and its perception in area of artistry, creativity, entrepreneurship, leadership, and organizing in reference to gender distinction; 3) Managers to understand the gender differences in the perception of the investigated identities by male- or female-dominated groups, organizations, and societies; 4) Leaders of sustainable development in practical choice of methods of work with gender diversified groups.

Potential research questions for future qualitative research or the hypothesis for further quantitative research may be: 1) Self-perception of identity may vary from the perception of the identity depending on the gender structure of the group or the society; 2) Self-perception of identity is similar to the perception of the identity by a particular group or society if the gender structure is similar.

References

- Aaltion, I., & Huang, J. (2007). Women managers' careers in information technology in China: High flyers with emotional costs? *Journal of Organizational Change Management*, 20(2), 227–244. <https://doi.org/10.1108/09534810710724775>
- Abodunrin, J. A. (2017). Audience Perception of Effective Communication in Nigerian Paintings. *Harmonia: Journal of Arts Research and Education*, 16(2), 103. <https://doi.org/10.15294/harmonia.v16i2.7824>
- Adams, R. B., Krrussl, R., Navone, M. A., & Verwijmeren, P. (2017). Is Gender in the Eye of the Beholder? Identifying Cultural Attitudes with Art Auction Prices. *CFS Working Paper Series*, 595, 1–31. <https://doi.org/10.2139/ssrn.3083500>
- Adler, N. J. (2006). The arts & leadership: Now that we can do anything, what will we do? *Academy of Management Learning and Education*, 5(4), 486–499. <https://doi.org/10.5465/AMLE.2006.23473209>
- Ahmad, S. M., & Zadeh, Z. F. (2016). Gender Differences on the Variables of Emotional Intelligence, Creative-Potential and Job Satisfaction in Managers. *Pakistan Journal of Psychology*, 47(2), 61–77. <http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=129038829&site=ehost-live>
- Alvesson, M., & Blom, M. (2015). Less Followership, Less Leadership? An Inquiry Into the Basic But Seemingly Forgotten Downsides of Leadership. *M@n@gement*, 18(3), 266–282.
- Atasoy, I., & Aktaş, A. B. (2020). The Effect of Gender and Other Factors on the Entrepreneurship Perception of Nursing Students. *Journal of Academic Research in Nursing*, 6(1), 80–88. <https://doi.org/10.5222/jaren.2020.89421>
- Baker, S., Marshburn, D. M., Crickmore, K. D., Rose, S. B., Dutton, K., & Hudson, P. C. (2012). What do you do? Perception of nurse manager responsibilities. *Nursing Management*, 43(12), 24–29. <https://doi.org/10.1097/01.NUMA.0000422890.99334.21>
- Baliyan, S. P., Mosia, P. A., & Baliyan, P. S. (2020). Gender differences in entrepreneurial attitudes and constraints: Do the constraints predict university agriculture graduates' attitudes towards entrepreneurship? *International Journal of Higher Education*, 9(5), 259–273. <https://doi.org/10.5430/ijhe.v9n5p259>
- Bayraktci, B., Forouz, A., Şahin, A. B., Abali, M., & Aliyeva, G. Z. (2009). Disease painting or painting disease: How does illness and hospitalisation affect children's artistry? *Perception*, 38(11), 1721–1727. <https://doi.org/10.1068/p6138>
- Bennett, D., & Hennekam, S. (2018). Self-authorship and creative industries workers' career decision-making. *Human Relations*, 71(11), 1454–1477. <https://doi.org/10.1177/0018726717747369>
- Bergmann, H., Geissler, M., Hundt, C., & Grave, B. (2018). The climate for entrepreneurship at higher education institutions. *Research Policy*, 47(4), 700–716. <https://doi.org/10.1016/j.respol.2018.01.018>
- Bhattacharya, J., & Petsche, H. (2002). Shadows of artistry: Cortical synchrony during perception and imagery of visual art. *Cognitive Brain Research*, 13(2), 179–186. [https://doi.org/10.1016/S0926-6410\(01\)00110-0](https://doi.org/10.1016/S0926-6410(01)00110-0)
- Bornman, D. A. J. (2019). Gender-based leadership perceptions and preferences of Generation Z as future business leaders in South Africa. *Acta Commercii*, 19(1). <https://doi.org/10.4102/ac.v19i1.708>
- Brands, R. A., Menges, J. I., & Kilduff, M. (2015). The leader-in-social-network schema: Perceptions of network structure affect gendered attributions of charisma. *Organization Science*, 26(4), 1210–1225. <https://doi.org/10.1287/orsc.2015.0965>
- Brewer, M. B., & Gardner, W. (1996). Who Is This “We”? Levels of Collective Identity and Self Representations. *Journal of Personality and Social Psychology*, 71(1), 83–93. <https://doi.org/10.1037/0022-3514.71.1.83>
- Bridgstock, R. (2012). Not a dirty word: Arts entrepreneurship and higher education. *Arts and Humanities in Higher Education Not*, 12(2–3), 122–137. <https://doi.org/https://doi.org/10.1177/1474022212465725>
- Brijlal, P. (2011). Entrepreneurial perceptions and knowledge: A survey of final year university students. *African Journal of Business Management*, 5(3), 818–825. <https://doi.org/10.5897/AJBM10.403>
- Brown, A. D. (2019). Identities in Organization Studies. *Organization Studies*, 40(1), 7–22. <https://doi.org/10.1177/0170840618765014>
- Bulei, I., Mihalcioiu, V., & Tucmeanu, A. (2014). The Professional vs. the Manager - Identity Issues and Key Features. *Valahian Journal of Economic Studies*, 5(3), 31–36.

- Bullough, A., & Renko, M. (2017). A Different Frame of Reference: Entrepreneurship and Gender Differences in the Perception of Danger. *Academy of Management Discoveries*, 3(1), 21–41. <https://doi.org/10.5465/amd.2015.0026>
- Bureau, S., & Zander, I. (2014). Entrepreneurship as an art of subversion. *Scandinavian Journal of Management*, 30(1), 124–133. <https://doi.org/10.1016/j.scaman.2013.12.002>
- Butler, D. M., & Preece, J. R. (2016). Recruitment and Perceptions of Gender Bias in Party Leader Support. *Political Research Quarterly*, 69(4), 842–851. <https://doi.org/10.1177/1065912916668412>
- Cardon, M. S., Wincent, J., Singh, J., & Drnovsek, M. (2009). The nature and experience of entrepreneurial passion. *Academy of Management Review*, 34(3), 511–532. <https://doi.org/10.5465/AMR.2009.40633190>
- Carroll, B., & Levy, L. (2008). Defaulting to management: Leadership defined by what it is not. *Organization*, 15(1), 75–96. <https://doi.org/10.1177/1350508407084486>
- Casey, E. (2021). Enfleshing the Spirit through Avatar Performance: Objecthood as Resistance in Women Preachers—Rachel Baker, Jarena Lee, and Florence Spearing Randolph. *Feminist Theology*, 29(2), 140–155. <https://doi.org/10.1177/0966735020965184>
- Chen, L. (2018). Thinking paradoxically: How and when female narcissistic leaders integrate gender–leader identities. *Social Behavior and Personality*, 46(2), 339–352. <https://doi.org/10.2224/sbp.6910>
- Chinangure, F., & Mapaire, L. (2019). The Effects of Transfer of Learning and Literacy: An Analysis of Graffiti and Sgraffiti in the City of Johannesburg. *Journal of Education, Society and Behavioural Science*, 32(4), 1–13. <https://doi.org/10.9734/jesbs/2019/v32i430178>
- Chow, I., & Crawford, R. B. (2004). Gender, Ethnic Diversity, and Career Advancement in the Workplace: The Social Identity Perspective. *SAM Advanced Management Journal*, 69, 22–31. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=14310375&site=ehost-live>
- Chusmir, L. H., & Koberg, C. S. (1986). Creativity differences among managers. *Journal of Vocational Behavior*, 29(2), 240–253. [https://doi.org/10.1016/0001-8791\(86\)90007-2](https://doi.org/10.1016/0001-8791(86)90007-2)
- Clarke, J. S., & Holt, R. (2019). Images of entrepreneurship: Using drawing to explore entrepreneurial experience. *Journal of Business Venturing Insights*, 11(June), 2019–2021. <https://doi.org/10.1016/j.jbvi.2019.e00129>
- Collica-Cox, K., & Schulz, D. (2020). When Doing Gender in the Joint: Perceptions of Being an Effective Woman Leader in Corrections. *Women and Criminal Justice*, 30(6), 427–444. <https://doi.org/10.1080/08974454.2019.1586028>
- Dahlsen, J. (2015). An Environmental Artist and PhD Candidate’s Observations of Globalism’s Post GFC Aftermath: Is There Economic Viability, for Marginalised Artists Creating the Culture of Environmental Sustainability? *Developmental Observer*, 8(1), 97–131. <https://doi.org/10.14434/do.v8i1.27785>
- Daliman, Sulandari, S., & Rosyana, I. (2019). The achievement of entrepreneurship competence and entrepreneurial intentions: Gender role, attitude and perception of entrepreneurship controls mediation. *Journal of Social Studies Education Research*, 10(4), 392–426.
- Damásio, M. J., & Bicacro, J. (2017). Entrepreneurship education for film and media arts: How can we teach entrepreneurship to students in the creative disciplines? *Industry and Higher Education*, 31(4), 253–266. <https://doi.org/10.1177/0950422217713110>
- Daoud, Y. S., Sarsour, S., Shanti, R., & Kamal, S. (2020). Risk tolerance, gender, and entrepreneurship: The Palestinian case. *Review of Development Economics*, 24(3), 766–789. <https://doi.org/10.1111/rode.12634>
- Datta, S., & Agarwal, U. A. (2017). Factors effecting career advancement of Indian women managers. *South Asian Journal of Business Studies*, 6(3), 314–336. <https://doi.org/10.1108/SAJBS-07-2016-0062>
- Davidsson, P. (2006). Nascent Entrepreneurship: Empirical Studies and Developments. *Foundations and Trends® in Entrepreneurship*, 2(1), 1–76.
- de la Cruz Sánchez-Escobedo, M., Díaz-Casero, J. C., Hernández-Mogollón, R., & Postigo-Jiménez, M. V. (2011). Perceptions and attitudes towards entrepreneurship. An analysis of gender among university students. *International Entrepreneurship and Management Journal*, 7(4), 443–463. <https://doi.org/10.1007/s11365-011-0200-5>
- Degot, V. (2007). Portrait of the manager as an artist. *Aesthesis: International Journal of Art and Aesthetics in Management and Organizational Life*, 1(3), 6–42.

- Dennis, M. R., & Kunkel, A. D. (2004). Perceptions of men, women, and CEOs: The effects of gender identity. *Social Behavior and Personality*, 32(2), 155–172. <https://doi.org/10.2224/sbp.2004.32.2.155>
- Deresiewicz, W. (2015). The Death of the Artist—and the Birth of the Creative. *The Atlantic*, February, 1–6. <http://www.theatlantic.com/magazine/archive/2015/01/the-death-of-the-artist-and-the-birth-of-the-creative-entrepreneur/383497/>
- Deresiewicz, W. (2020). *The Death of the Artist: How Creators Are Struggling to Survive in the Age of Billionaires and Big Tech*. Henry Holt and Co.
- Dufour, L., Maoret, M., & Montani, F. (2020). Coupling High Self-Perceived Creativity and Successful Newcomer Adjustment in Organizations: The Role of Supervisor Trust and Support for Authentic Self-Expression. *Journal of Management Studies*, 57(8), 1531–1555. <https://doi.org/10.1111/joms.12547>
- Duygu Seckin, H., & Tutku Seckin, C. (2019). A Qualitative Look into Gendered Entrepreneurship in Turkey. *A Qualitative Look into Gendered Entrepreneurship in Turkey*, 47(2), 105–123.
- Elliott, C., Mavriplis, C., & Anis, H. (2020). An entrepreneurship education and peer mentoring program for women in STEM: mentors' experiences and perceptions of entrepreneurial self-efficacy and intent. *International Entrepreneurship and Management Journal*, 16(1), 43–67. <https://doi.org/10.1007/s11365-019-00624-2>
- Elstad, B., & Jansson, D. (2020). From Artist to Manager—Working Conditions, Career Satisfaction, and Professional Identity among Graduated Arts Management Students. *Journal of Arts Management Law and Society*, 50(3), 184–198. <https://doi.org/10.1080/10632921.2020.1746717>
- Enhuber, M. (2014). How is Damien Hirst a Cultural Entrepreneur? *Artivate: A Journal of Entrepreneurship in the Arts*, 3(2), 3–20. [https://repository.asu.edu/attachments/146224/content/Artivate Vol 3 No 2 pages 3-20 Enhuber.pdf](https://repository.asu.edu/attachments/146224/content/Artivate_Vol_3_No_2_pages_3-20_Enhuber.pdf)
- Erat, S., Kitapçı, H., & Akçin, K. (2020). Managerial perception and organizational identity: A comparative analysis. *Sustainability*, 12(6), 1–16. <https://doi.org/10.3390/su12062278>
- Fernández-Laviada, A., López-Gutiérrez, C., & Pérez, A. (2020). How does the development of the social enterprise sector affect entrepreneurial behavior? An empirical analysis. *Sustainability (Switzerland)*, 12(3), 1–15. <https://doi.org/10.3390/su12030826>
- Gangi, J. (2018). Classical guitar study as creativity training: Potential benefits for managers and entrepreneurs. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(45), 1–10. <https://doi.org/10.3390/joitmc4040045>
- Garrigós, C. (2017). Warriors and mystics: Religious iconography, eroticism, blasphemy and gender in punk female artists. In *Lectora* (Issue 23, pp. 51–65). <https://doi.org/10.344/Lectora2017.23.4>
- Gatling, A., Molintas, D. H. R., Self, T. T., & Shum, C. (2020). Leadership and behavioral integrity in the restaurant industry: the moderating roles of gender. *Journal of Human Resources in Hospitality and Tourism*, 19(1), 62–81. <https://doi.org/10.1080/15332845.2020.1672249>
- Gerpott, F. H., Van Quaquebeke, N., Schlamp, S., & Voelpel, S. C. (2019). An Identity Perspective on Ethical Leadership to Explain Organizational Citizenship Behavior: The Interplay of Follower Moral Identity and Leader Group Prototypicality. *Journal of Business Ethics*, 156(4), 1063–1078. <https://doi.org/10.1007/s10551-017-3625-0>
- Gołaszewska, M. (1984). *Zarys estetyki*. PWN.
- Gray, D. E., Gabriel, Y., & Goregaokar, H. (2015). Coaching unemployed managers and professionals through the trauma of unemployment: Derailed or undaunted?*. *Management Learning*, 46(3), 299–316. <https://doi.org/10.1177/1350507614532752>
- Grigoryan, L. K., & Kotova, M. V. (2018). National identity management strategies: Do they help or hinder adoption of multiculturalism in Russia? *Psychology in Russia: State of the Art*, 11(3), 18–35. <https://doi.org/10.11621/pir.2018.0302>
- Hallier, J. (2004). Embellishing the past: Middle manager identity and informality in the implementation of new technology. *New Technology, Work and Employment*, 19(1), 43–62. <https://doi.org/10.1111/j.1468-005X.2004.00127.x>
- Hancock, A. J., Clarke, H. M., & Arnold, K. A. (2020). Sexual orientation occupational stereotypes. *Journal of Vocational Behavior*, 119. <https://doi.org/10.1016/j.jvb.2020.103427>
- Hatch, M. J., Kostera, M., & Koźmiński, A. K. (2006). The three faces of leadership: Manager, artist, priest. *Organizational Dynamics*,

35(1), 49–68. <https://doi.org/10.1016/j.orgdyn.2005.12.003>

- Hennekam, S., & Bennett, D. (2016). Self-management of work in the creative industries in the Netherlands. *International Journal of Arts Management*, 19(1), 31–41.
- Herbst, T. H. H. (2020). Gender differences in self-perception accuracy: The confidence gap and women leaders' underrepresentation in academia. *SA Journal of Industrial Psychology*, 46. <https://doi.org/10.4102/sajip.v46i0.1704>
- Horn, D., & Salvendy, G. (2009). Measuring consumer perception of product creativity: Impact on satisfaction and purchasability. *Human Factors and Ergonomics In Manufacturing*, 19(3), 223–240. <https://doi.org/10.1002/hfm.20150>
- Hracs, B. J. (2015). Cultural Intermediaries in the Digital Age: The Case of Independent Musicians and Managers in Toronto. *Regional Studies*, 49(3), 461–475. <https://doi.org/10.1080/00343404.2012.750425>
- Hudson, D., McLoughlin, C., Margret, A., & Pandjaitan, Y. (2020). Leadership, identity and performance: the nature and effect of 'prototypicality' in Indonesia. *Politics and Governance*, 8(4), 201–213. <https://doi.org/10.17645/pag.v8i4.3553>
- Jankurová, A., Ljudvigová, I., & Gubová, K. (2017). Research of the nature of leadership activities. *Economics and Sociology*, 10(1), 135–151. <https://doi.org/10.14254/2071-789X.2017/10-1/10>
- Kasmaienezhadford, S., Talebloo, B., Roustae, R., & Pourrajab, M. (2015). Students' Learning Through Teaching Creativity: Teachers' Perception. *Journal of Educational, Health and Community Psychology*, 4(1), 1–13. <https://doi.org/10.12928/jehcp.v4i1.3699>
- Kharlamova, A., & Stavitsky, A. (2020). The Gender Issue in Entrepreneurship Activity: the Current Perception of Entrepreneurs. *Bulletin of Taras Shevchenko National University of Kyiv. Economics*, 210, 42–52. <https://doi.org/10.17721/1728-2667.2020/210-3/6>
- Kiran, N., Afzal, M., Hussain, M., & Gilani, S. A. (2019). Initials Impact of Nursing Manager Perception of Empowerment and Years of Experience on Resistance to Change in Practice. *Journal of Health, Medicine and Nursing*, 62, 82–89. <https://doi.org/10.7176/jhmn/62-11>
- Ko, I., Kotrba, L., & Roebuck, A. (2015). Leaders as Males?: The Role of Industry Gender Composition. *Sex Roles*, 72(7–8), 294–307. <https://doi.org/10.1007/s11199-015-0462-4>
- Kohail, Y., Saida, Y., Obad, J., & Soulhi, A. (2016). The Qualities of a Good Manager ... What Does It Means? Lessons Learned from the Undergraduate Business Students' Perception in Kingdom of Morocco. *International Journal of Business and Management*, 11(8), 86–96. <https://doi.org/10.5539/ijbm.v11n8p86>
- Kunrath, K., Cash, P., & Kleinsmann, M. (2020). Social- and self-perception of designers' professional identity. *Journal of Engineering Design*, 31(2), 100–126. <https://doi.org/10.1080/09544828.2019.1676883>
- Lähdesmäki, M. (2012). Construction of owner-manager identity in corporate social responsibility discourse. *Business Ethics*, 21(2), 168–182. <https://doi.org/10.1111/j.1467-8608.2011.01644.x>
- Lebuda, I., & Csikszentmihalyi, M. (2020). All You Need Is Love: The Importance of Partner and Family Relations to Highly Creative Individuals' Well-Being and Success. *Journal of Creative Behavior*, 54(1), 100–114. <https://doi.org/10.1002/jocb.348>
- Lee, C. (2020). How does openness about sexual and gender identities influence self-perceptions of teacher leader authenticity? *Educational Management Administration and Leadership*. <https://doi.org/10.1177/1741143220929036>
- Lehmann, J., & Gaskins, B. (2019). Learning scientific creativity from the arts. In *Palgrave Communications* (Vol. 5, Issue 95, pp. 1–5). <https://doi.org/10.1057/s41599-019-0308-8>
- Leso, G., Dias, G., Ferreira, J. P., Gama, J., & Couceiro, M. S. (2017). Perception of Creativity and Game Intelligence in Soccer. *Creativity Research Journal*, 29(2), 182–187. <https://doi.org/10.1080/10400419.2017.1302779>
- Lewis, K. V., Ho, M., Harris, C., & Morrison, R. (2016). Becoming an entrepreneur: Opportunities and identity transitions. *International Journal of Gender and Entrepreneurship*, 8(2), 1–6. <https://doi.org/http://dx.doi.org/10.1108/IJGE-02-2015-0006>
- Lindholm, S. (2015). Creating a “Latino” Artist Identity in-between Sweden and Latin America - A Comparative Approach. *Kulturstudier*, 6(2), 113–135. <https://doi.org/10.7146/ks.v6i2.22583>
- López-Fernández, M., Romero-Fernández, P. M., & Aust, I. (2018). Socially responsible human resource management and employee

perception: The influence of manager and line managers. *Sustainability (Switzerland)*, 10(12), 1–19. <https://doi.org/10.3390/su10124614>

Lord, R. G., & Brown, D. J. (2001). Leadership, values, and subordinate self-concepts. *The Leadership Quarterly*, 12, 133–152.

Lutas, M., Nistor, R., Radu, M., & Beleiu, I. (2020). Perceptions regarding the profile of an ideal project manager. *Amfiteatru Economic*, 22(54), 608–622. <https://doi.org/10.24818/EA/2020/54/608>

Masso, A. (2010). Geographical perspective on identity construction: Identification strategies of Russian youth in Estonia. *International Journal of Interdisciplinary Social Sciences*, 5(6), 51–62. <https://doi.org/10.18848/1833-1882/CGP/v05i06/51763>

McHugh, K. E. (2015). Touch at a distance: toward a phenomenology of film. *GeoJournal*, 80(6), 839–851. <https://doi.org/10.1007/s10708-015-9650-6>

McNeill, L., & Venter, B. (2019). Identity, self-concept and young women's engagement with collaborative, sustainable fashion consumption models. *International Journal of Consumer Studies*, 43(4), 368–378. <https://doi.org/10.1111/ijcs.12516>

Meister, A., Sinclair, A., & Jehn, K. A. (2017). Identities under scrutiny: How women leaders navigate feeling misidentified at work. *Leadership Quarterly*, 28(5), 672–690. <https://doi.org/10.1016/j.leaqua.2017.01.009>

Miller, D. L. (2016). Gender and the Artist Archetype: Understanding Gender Inequality in Artistic Careers. *Sociology Compass*, 10(2), 119–131. <https://doi.org/10.1111/soc4.12350>

Montgomery, N. V., & Cowen, A. P. (2020). How leader gender influences external audience response to organizational failures. *Journal of Personality and Social Psychology*, 118(4), 639–660. <https://doi.org/10.1037/pspa0000176>

Moorosi, P. (2020). Constructions of Leadership Identities via Narratives of African Women School Leaders. *Frontiers in Education*, 5. <https://doi.org/10.3389/educ.2020.00086>

Mungai, E. N., & Ogot, M. (2012). Gender, Culture and Entrepreneurship in Kenya. *International Business Research*, 5(5). <https://doi.org/10.5539/ibr.v5n5p175>

Naderi, H., Abdullah, R., Aizan, H. T., Sharir, J., & Mallan, V. K. (2009). Gender differences in creative perceptions of undergraduate students. *Journal of Applied Sciences*, 9(1), 167–172. <https://doi.org/10.3923/jas.2009.167.172>

Nikolski, K. (2015). Leadership and Management: Practice of the Art of Influence. *Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series*, 2(1), 31–39.

Nowak, S. (2007). Metodologia Badań Społecznych. In *Metodologia Badań Społecznych*. Wydawnictwo Naukowe PWN.

Orser, B., Elliott, C., & Findlay-Thompson, S. (2012). Women-focused small business programming: Client motives and perspectives. *International Journal of Gender and Entrepreneurship*, 4(3), 236–265. <https://doi.org/10.1108/17566261211264145>

Parker, O., Mui, R., & Titus, V. (2020). Unwelcome voices: The gender bias-mitigating potential of unconventional. *Strategic Management Journal*, 41(4), 738–757. <https://doi.org/10.1002/smj.3104>

Peachey, J. W., & Burton, L. J. (2011). Male or Female Athletic Director? Exploring Perceptions of Leader Effectiveness and a (Potential) Female Leadership Advantage with Intercollegiate Athletic Directors. *Sex Roles*, 64(5–6), 416–425. <https://doi.org/10.1007/s11199-010-9915-y>

Postuła, A., & Majczyk, J. (2018). Managers and leaders in need of entrepreneurial competences. *Entrepreneurial Business and Economics Review*, 6(1), 91–103. <https://doi.org/10.15678/EBER.2018.060105>

Rai, S. (2018). Can we look beyond gender social roles in Indian management? *Teorija in Praksa*, 55(3), 518–541.

Rambe, P., & Ndofirepi, T. M. (2017). Gender Differences in the Perceptions of Entrepreneurship Hindrances: A Case of Vocational Education Students in Zimbabwe. *Journal of Economics and Behavioral Studies*, 8(6(J)), 94–113. [https://doi.org/10.22610/jeb.v8i6\(j\).1486](https://doi.org/10.22610/jeb.v8i6(j).1486)

Raso, R., Fitzpatrick, J. J., & Masick, K. (2020). Clinical nurses' perceptions of authentic nurse leadership and healthy work environment. *Journal of Nursing Administration*, 50(9), 489–494. <https://doi.org/10.1097/NNA.0000000000000921>

- Reedy, P. (2008). Mirror, mirror, on the wall: Reflecting on the ethics and effects of a collective critical management studies identity project. *Management Learning*, 39(1), 57–72. <https://doi.org/10.1177/1350507607085978>
- Reutzel, C. R., Collins, J. D., & Belsito, C. A. (2018). Leader gender and firm investment in innovation. *Gender in Management*, 33(6), 430–450. <https://doi.org/10.1108/GM-05-2017-0066>
- Rhee, K. S., & Sigler, T. H. (2015). Untangling the relationship between gender and leadership. *Gender in Management*, 30(2), 109–134. <https://doi.org/10.1108/GM-09-2013-0114>
- Rose, L. E. (2017). The Diaries of Mary Seton Watts (1849–1938): A Record of Her Conjugal Creative Partnership with ‘England’s Michelangelo’, George Frederic Watts (1817–1904). *Life Writing*, 14(2), 217–231. <https://doi.org/10.1080/14484528.2017.1291248>
- Rosette, A. S., Mueller, J. S., & Lebel, R. D. (2015). Are male leaders penalized for seeking help? The influence of gender and asking behaviors on competence perceptions. *Leadership Quarterly*, 26(5), 749–762. <https://doi.org/10.1016/j.leaqua.2015.02.001>
- Rosewell, K., & Ashwin, P. (2019). Academics’ perceptions of what it means to be an academic. *Studies in Higher Education*, 44(12), 2374–2384. <https://doi.org/10.1080/03075079.2018.1499717>
- Saavedra Llamas, M., & Grijalba de la Calle, N. (2020). The creative cinematographic process at the service of national identity: Pedro Almodóvar and the promotion of Spanish stereotypes. *Creativity Studies*, 13(2), 369–386. <https://doi.org/10.3846/cs.2020.8563>
- Saint-Michel, S. E. (2018). Leader gender stereotypes and transformational leadership: Does leader sex make the difference? *Management (France)*, 21(3), 944–966. <https://doi.org/10.3917/mana.213.0944>
- Samuel, R., & Kanji, S. (2020). Valuing creativity, feeling overworked and working hours: Male workers and the New Spirit of Capitalism. *Time and Society*, 29(1), 51–73. <https://doi.org/10.1177/0961463X18820730>
- Schediwy, L., Bhansing, P. V., & Loots, E. (2018). Young musicians’ career identities: do bohemian and entrepreneurial career identities compete or cohere? *Creative Industries Journal*, 11(2), 174–196. <https://doi.org/10.1080/17510694.2018.1489197>
- Schielke, T. (2020). Interpreting Art with Light: Museum Lighting between Objectivity and Hyperrealism. *LEUKOS - Journal of Illuminating Engineering Society of North America*, 16(1), 7–24. <https://doi.org/10.1080/15502724.2018.1530123>
- Schreiner, E., Trent, S. B., Prange, K. A., & Allen, J. A. (2018). Leading volunteers: Investigating volunteers’ perceptions of leaders’ behavior and gender. *Nonprofit Management and Leadership*, 29(2), 241–260. <https://doi.org/10.1002/nml.21331>
- Sethi, A., Mishra, N., & Dash, M. (2012). Social Identity Crisis Amongst Employees in Mergers & Acquisitions. *SSRN Electronic Journal*, 244–263. <https://doi.org/10.2139/ssrn.1588565>
- Shakespeare, D., Porcaro, L., Gómez, E., & Castillo, C. (2020). Exploring artist gender bias in music recommendation. In *arXiv*.
- Shung-King, M., Gilson, L., Mbachu, C., Molyneux, S., Muraya, K. W., Uguru, N., & Govender, V. (2018). Leadership experiences and practices of South African health managers: What is the influence of gender? *International Journal for Equity in Health*, 17(1). <https://doi.org/10.1186/s12939-018-0859-0>
- Stuke, K. B. (2013). Understanding Leadership Through Leadership Understandings. *Journal of Leadership Studies*, 7(2), 55–61. <https://doi.org/10.1002/jls.21291>
- Sveningsson, S., & Alvesson, M. (2003). Managing managerial identities: Organizational fragmentation, discourse and identity struggle. *Human Relations*, 56(10), 1163–1193. <https://doi.org/10.1177/00187267035610001>
- Szczepaniak, K. (2018). Arts for Business: Creative Co-operation for Innovation and Sustainable Development of the Company as a Brand and Community. *Kwartalnik Ekonomistów i Menedżerów*, 50(4), 127–141. <https://doi.org/10.5604/01.3001.0013.0639>
- Szostak, M. (2018). The French Symphonic Organs – instrument as inspiration for the performer. *The Organ*, 386, 6–27. <https://depot.ceon.pl/handle/123456789/19172>
- Szostak, M. (2020a). Creativity and Artistry in Organ Music. *The Organ*, 391, 24–31. <https://depot.ceon.pl/handle/123456789/19170>
- Szostak, M. (2020b). The Perception of Organ Music. *The Organ*, 393, 8–13. <https://depot.ceon.pl/handle/123456789/19174>
- Szostak, M., & Sułkowski, Ł. (2020a). Manager as an artist: Creative endeavour in crossing the borders of art and organizational discourse.

Creativity Studies, 13(2), 351–368. <https://doi.org/10.3846/cs.2020.11373>

- Szostak, M., & Sułkowski, L. (2021a). Identity crisis of artists during the COVID-19 pandemic and shift towards entrepreneurship. *Entrepreneurial Business and Economics Review*, 9(3), 87–102. <https://doi.org/10.15678/EBER.2021.090306>
- Szostak, M., & Sułkowski, L. (2021b). The Identity and Self-Perception of Artists-Managers. *Problems and Perspectives in Management*, 19(1), 372–386. [https://doi.org/10.21511/ppm.19\(1\).2021.32](https://doi.org/10.21511/ppm.19(1).2021.32)
- Szostak, M., & Sułkowski, L. (2020b). Kitsch in Management: characteristic forms, carriers and propagators. *Education Excellence and Innovation Management : A 2025 Vision to Sustain Economic Development during Global Challenges : Proceedings of the 35th International Business Information Management Association Conference (IBIMA), 1-2 April 2020*, 7584–7598. https://www.researchgate.net/publication/345996764_Kitsch_in_Management_characteristic_forms_carriers_and_propagators
- Taleghani, M. (2012). Impact of Attitudes on Managers Creativity. *Procedia - Social and Behavioral Sciences*, 40, 65–70. <https://doi.org/10.1016/j.sbspro.2012.03.162>
- Tatarkiewicz, W. (2015). *Historia estetyki*. PWN.
- Tendayi Viki, G., & Williams, M. L. J. (2014). The role of identity integration in enhancing creativity among mixed-race individuals. *Journal of Creative Behavior*, 48(3), 198–208. <https://doi.org/10.1002/jocb.48>
- Thomas, Z. (2019). Suffragist artists in partnership: gender, word and image. *Nineteenth-Century Contexts*, 41(3), 339–341. <https://doi.org/10.1080/08905495.2019.1598031>
- Thoroughgood, C. N., Sawyer, K. B., & Hunter, S. T. (2013). Real Men Don't Make Mistakes: Investigating the Effects of Leader Gender, Error Type, and the Occupational Context on Leader Error Perceptions. *Journal of Business and Psychology*, 28(1), 31–48. <https://doi.org/10.1007/s10869-012-9263-8>
- Tican, C. (2019). Pre-Service Primary School and Pre-School Teachers' Perception of Individual Entrepreneurship and Opinions about Their Creative Thinking Tendency. *International Journal of Educational Methodology*, 5(4), 591–606. <https://doi.org/10.12973/ijem.5.4.591>
- Tonoyan, V., Strohmeier, R., & Jennings, J. E. (2020). Gender Gaps in Perceived Start-up Ease: Implications of Sex-based Labor Market Segregation for Entrepreneurship across 22 European Countries. *Administrative Science Quarterly*, 65(1), 181–225. <https://doi.org/10.1177/0001839219835867>
- Toscher, B. (2019). Entrepreneurial Learning in Arts Entrepreneurship Education: A Conceptual Framework. *Arti*, 8(1), 3–22.
- Toscher, B. (2020). Blank Canvas: Explorative Behavior and Personal Agency in Arts Entrepreneurship Education. *Artivate: A Journal of Entrepreneurship in the Arts*, 9(2), 19–44. <https://doi.org/10.34053/artivate.9.2.115>
- Tzinerr, A., & Barsheshet-Picke, L. (2014). Authentic management as a moderator of the relationship between the congruence of gender role identity - Gender management characteristics, and leader-member exchange (LMX). *Revista de Psicología Del Trabajo y de Las Organizaciones*, 30(2), 49–60. <https://doi.org/10.1016/j.rpto.2014.06.004>
- United Nations. (2021). *Country classification*. World Economic Situation and Prospects 2020. https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2020_FullReport.pdf
- Vázquez-Parra, J. C., García-González, A., & Ramírez-Montoya, M. S. (2020). Social entrepreneurship competency: an approach by discipline and gender. *Journal of Applied Research in Higher Education*. <https://doi.org/10.1108/JARHE-09-2020-0317>
- Veldman, J., Meeussen, L., Van Laar, C., & Phalet, K. (2017). Women (do not) belong here: Gender-work identity conflict among female police officers. *Frontiers in Psychology*, 8(FEB). <https://doi.org/10.3389/fpsyg.2017.00130>
- Vincent, L. C., & Kouchaki, M. (2016). Creative, rare, entitled, and dishonest: How commonality of creativity in one's group decreases an individual's entitlement and dishonesty. *Academy of Management Journal*, 59(4), 1451–1473. <https://doi.org/10.5465/amj.2014.1109>
- Violanti, M. T., & Jurczak, L. P. (2011). The Effect of Sex and Gender on Perceptions of Leaders: Does Situation Make a Difference? *Advancing Women in Leadership*, 31, 45–56. http://advancingwomen.com/awl/awl_wordpress/
- Voss, Z. G., Cable, D. M., & Voss, G. B. (2006). Organizational identity and firm performance: What happens when leaders disagree about

“who we are?” *Organization Science*, 17(6), 741–755. <https://doi.org/10.1287/orsc.1060.0218>

Walter, H. M. (2015). *Artist, Professional, Gentleman: Designing the Body of the Actor-Manager, 1870-1900*. Royal College of Art.

Warhurst, R. (2011). Managers’ practice and managers’ learning as identity formation: Reassessing the mba contribution. *Management Learning*, 42(3), 261–278. <https://doi.org/10.1177/1350507610387567>

Watson, T. J. (2009). Narrative, life story and manager identity: A case study in autobiographical identity work. *Human Relations*, 62(3), 425–452. <https://doi.org/10.1177/0018726708101044>

Wilson, C., & Brown, M. (2012). Sound, space, image and music: Hybridity in creative process through technology, interactivity and collaboration. *Journal of Music, Technology and Education*, 5(1), 89–107. https://doi.org/10.1386/jmte.5.1.89_1

Wimschneider, C., & Brem, A. (2019). The perception of creativity through multicultural experience -results from an empirical analysis. *International Journal of Innovation Management*, 23(7). <https://doi.org/10.1142/S1363919619500658>

Wolf, C. (2019). Not lost in translation: Managerial career narratives and the construction of protean identities. *Human Relations*, 72(3), 505–533. <https://doi.org/10.1177/0018726718778094>

Woodward, J. B., & Funk, C. (2010). Developing the artist-leader. *Leadership*, 6(3), 295–309. <https://doi.org/10.1177/1742715010368768>

Yazar, T., & Arifoglu, G. (2012). A Research of Audio Visual Educational Aids on the Creativity Levels of 4-14 Year Old Children as a Process in Primary Education. *Procedia - Social and Behavioral Sciences*, 51, 301–306. <https://doi.org/10.1016/j.sbspro.2012.08.163>

Yuan, Z., & Li, X. (2019). Measurement Model for Students’ Ethnic Identity, National Identity, and Perception of Social Mobility in China: Exploratory and Confirmatory Factor Analyses. *SAGE Open*, 9(2), 1–14. <https://doi.org/10.1177/2158244019844093>

Yun, D., Jung, H., & Ashihara, K. (2020). Dimensions of Leader Anger Expression Unveiled: How Anger Intensity and Gender of Leader and Observer Affect Perceptions of Leadership Effectiveness and Status Conferral. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01237>

Zambrell, K. (2016). Managers’ identity construction at work: Artistic interventions as triggers for identity work. *Organizational Aesthetics*, 5(2), 34–67.

Zhou, J., Shin, S. J., & Cannella, A. A. (2008). Employee self-perceived creativity after mergers and acquisitions: Interactive effects of threat and opportunity perception, access to resources, and support for creativity. *Journal of Applied Behavioral Science*, 44(4), 397–421. <https://doi.org/10.1177/0021886308328010>

Zocche, L., de Paula, I. C., Kunrath, S. E., Martins, V. L. M., & Lermen, F. H. (2018). Variables that influence creativity in perception of professionals: A case study in innovative Brazilian companies. *Thinking Skills and Creativity*, 29, 170–184. <https://doi.org/10.1016/j.tsc.2018.07.002>

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CONSUMERS' PERCEPTIONS OF INTENTION TO USE A CREDIT CARD: PERCEIVED RISK AND SECURITY*

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Abstract. The goal of this study is to combine the Technology Acceptance Model (TAM) with the theory of perceived risk to create a hypothetical model for consumer behavioral intention that will be validated using data from Saudi Arabia's intended credit card usage. 217 bank customers were polled via an online survey conducted across the country. Exploratory and confirmatory factor analyses were used to evaluate the factor structure of the measuring items, while structural equation modeling was being used to validate the recommended model and test the assumptions. Social influence (SI), perceived usefulness (PU), perceived ease of use (PEU), and perceived trust (PT) were all significant predictors of perceived risk (PR) and perceived security (PS) to affect consumer intention to use a credit card (IUCC), according to the results of structural equation modeling (SEM). This research might have assisted banks in establishing new customer acquisition tactics and determining how to deploy resources to retain and grow their existing customer base. As a consequence, this study adds to the body of information on consumer behavior by verifying the effects of PR and PS on credit card intention, which most prior studies have not shown. The study also delivers genuine data about Saudi Arabia's e-banking services, particularly in the credit card sector, to an academic research platform.

Keywords: credit cards; perceived security; perceived risk; Technology Acceptance Model; structural equation modeling

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JEL Classifications: E21, E40

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1. Introduction

In the previous 15 years, Saudi Arabia's payment systems have evolved considerably. SAMA (www.sama-ksa.org), the Saudi Arabian Monetary Agency, has taken the lead in the development and day-to-day administration of a modern national payments infrastructure to support the Kingdom's economic development, and it continues to do so with the participation and assistance of commercial banks. This cooperative approach to building an efficient and shared payments infrastructure that relies on the best available techniques and technology from modern banking systems has yielded considerable benefits for both banks and their consumers. Customers have benefited from contemporary payment systems such as credit cards' ease of use and accessibility, while banks have avoided making costly competitive expenditures. A credit card is a sort of payment mechanism that is named after the little plastic card that is provided to customers. It allows the cardholder to obtain cash from a credit institution at a rate determined by the cardholder, up to a specified limit. The funds are usually only useful for purchases; however, they can be acquired in cash as well. The electronic card consists of a debit card linked to a local bank and a credit card linked to both a local and foreign bank (Ngonga, 2015). Consumer behaviour, when it comes to credit cards, has been impacted by individual demographic factors, credit card features, and personal perceptions. Disparities in age, gender, employment, and financial position, according to some researchers, have been demonstrated to contribute to variations in personal inclination to use credit cards (Prusti et al., 2021; Jamshidi & Kuanova, 2020). Consumers prefer credit cards to other payment methods like cash, e-money, or debit cards because of the benefits they provide, according to others (Lee & Lee, 2021; Al-Saedi et al., 2020). Rational customers are concerned not just about the advantages of having a credit card, but also about the hazards of losing money (Fishbein and Ajzen, 1975). Furthermore, several empirical research have found that social groupings including family, friends, and coworkers have a substantial impact on credit card usage intentions (Yuan et al., 2021; Hussein et al., 2021). According to numerous studies, the perception of risk is a key factor restricting use of e-services (Roy et al., 2017). Similarly, PR has been considered while selecting whether or not to use credit cards (Hussein et al., 2021; Cornea, 2021; Boden et al., 2020). However, the results were mixed: public relations had a substantial negative impact (Cornea, 2021), a significant positive impact (Hussein et al., 2021), or no impact on consumer willingness to use credit cards (Hussein et al., 2021; Boden et al., 2020). Credit cards are a type of technology that may be utilized on electronic devices to fulfill two basic functions: payment and credit (Ala'raj et al., 2021). Credit cardholders have the option of purchasing first and paying later, thanks to the bank's guarantee (Lebichot et al., 2021). As a result, the cardholder's issuing bank will pay the biller on their behalf, and the cardholder is responsible for timely and complete payback of all payments (Ala'raj et al., 2021). Credit cards are getting increasingly popular and widely utilized in modern transactions throughout the world (Jamshidi & Kuanova, 2020). As the credit card industry grows more competitive, banks will need a deeper understanding of customer behavior. Unlike previous studies, however, this one concentrates on the effects of PR and PS on credit card usage intentions, and in order to do this, the research begins with a quick evaluation of customer behavior. As a consequence, a theoretical model and testable assumptions have been developed, as well as techniques and data from Saudi customers.

2. Development of a research model and hypotheses

To understand customer intentions and actual behavior, several research frameworks have been created over time. The PR theory (TPR) is one of the most well-known (Bauer, 1960). It examines how customers' concerns of possible losses influence their purchase decisions in certain circumstances. Consumers, are not just risk averse but also rational; they intend to do something when it is advantageous, simple, or when they are influenced, as theories like the theory of reasoned actions indicate (Fishbein and Ajzen, 1975). Some of the theories that have been offered include TAM (Davis et al., 1989), the theory of planning behavior (TPB) (Ajzen, 1991), and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003). These ideas are used

separately or combined in several studies on how customers anticipate utilizing e-services (Alalwan et al., 2017; Pelaez et al., 2019). Therefore, the current study looked into seven factors that influence credit card acceptance, as shown in Figure 1: social influence (SI), perceived usefulness (PU), perceived ease of use (PEU), perceived trust (PT), perceived risk (PR), perceived security (PS), and consumer intention to use a credit card (IUCC).

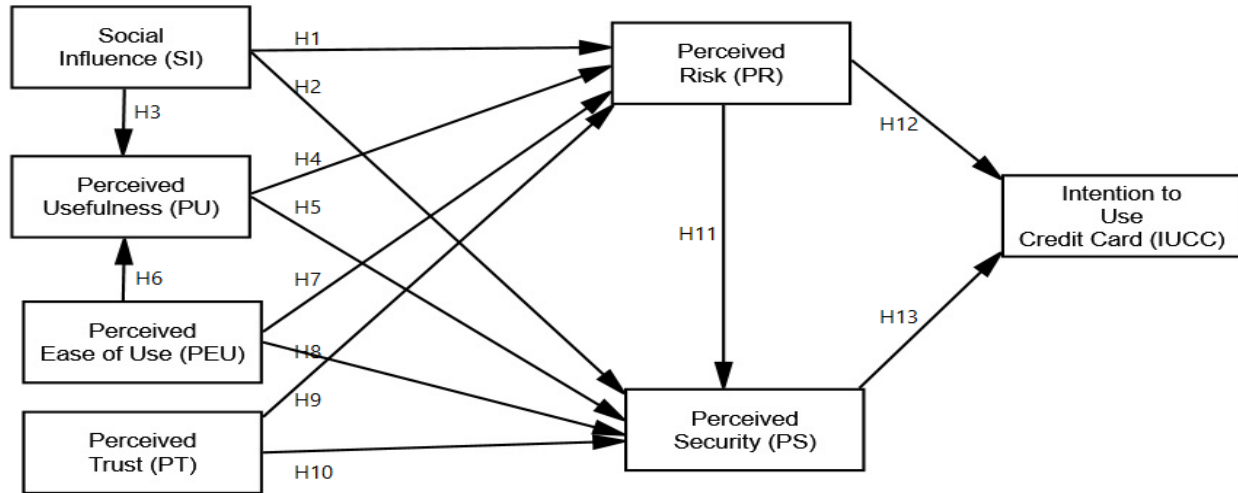


Figure 1. Research Model and Hypotheses Source: Authors

2.1 Social Influence (SI)

SI is a customer's opinion that important people think he or she should or should not do something (Ajzen, 1991; Venkatesh et al., 2003). Consumers are compelled to research and assess credit card features, and they become irritated when their friends and coworkers use and discuss them frequently (Al-Saedi et al., 2020). Consumers tend to acquire and reproduce their family members' financial attitudes and practices (Lebichot et al., 2021). Furthermore, mass media aiming at a broad audience has aided in increasing consumer awareness of credit cards (Yuan et al., 2021). According to an empirical study, social groups' perspectives can influence one's intention to use credit cards (Cornea, 2021; Hussein et al., 2021; Lebichot et al., 2021; Yuan et al., 2021). Because of PU and PEU, SI only impacts the planned usage of credit cards, according to (Jung & Kang, 2021).

2.2 Perceived Usefulnes (PU)

The degree to which a person feels that utilizing a system will improve his or her performance is described as the system's PU (Davis et al., 1989; Venkatesh et al., 2003). Non-cash payments and personal consumer credit are made easier with credit cards (Liu & Dewitte, 2021). Due of the insecurity of carrying cash (Trinh et al., 2021) or special discounts from well-known companies, consumers prefer credit cards to cash (Aydin, 2021). They rely on revolving credit cards with extended grace periods as a source of revolving credit (Trinh et al., 2021; Liu & Dewitte, 2021). They can even make cash withdrawals with credit cards if necessary (Liu & Dewitte, 2021). As a result, customers value the convenience of using a credit card and are more inclined to do so for everyday purchases (Lee & Lee, 2021; Cornea, 2021; Lebichot et al., 2021; Hussein et al., 2021).

2.3 Perceived Ease of Use (PEU)

PEU was defined by Ajzen (1991) and Davis et al. (1989) as the degree to which a person feels that utilizing a system is simple. According to Ajzen (1991), this perception is determined by a comprehensive set of control beliefs. Consumers may easily register a credit card using a simple and rapid method (Al-Saedi et al., 2020). Credit cards may be used in a variety of electronic devices, according to Liu & Dewitte. (2021) and Aydin. (2021). (2015). Furthermore, cardholders don't have to put much effort into the credit card payment method because it is so simple to comprehend and use on a regular basis (Trinh et al., 2021). As a result, numerous studies have shown that credit card users value them and desire to use them regularly (Yuan et al., 2021; Cornea, 2021; Lebichot et al., 2021; Jamshidi & Kuanova, 2020; Boden et al., 2020).

2.4 Perceived Trust (PT)

Customers' trust and loyalty are critical factors that impact an organization's performance; a bank's excellent reputation is required to retain its market position. It indicates that customers trust banks. The opportunity to utilize credit cards has piqued people's interest (Flavian et al, 2005). When customers recognize that banks function according to a set of principles, they have trust in the banking system because of the benefits it provides. Client loyalty, on the other hand, is influenced by trust and commitment, particularly when clients trust banks' goods and services (Hassan et al., 2012). Customer views of banks, on the other hand, are influenced by negative opinions of banks, which erode consumer trust and loyalty (Kang and James, 2004).

2.5 Perceived Risk (PR)

PR refers to a customer's subjective expectations for loss in the event of an occurrence in terms of consumer behavior (Bauer, 1960; Featherman and Pavlou, 2003). Consumers are given a credit line with which to pay their expenses, and they must invest a significant amount of time, money, and effort in order to optimize it (Liu & Dewitte, 2021). Payments not always are made due to operational issues or system failures (Hussein et al., 2021). In the meanwhile, personal privacy and system security are at risk, and customers may be held accountable until authorities define stakeholder responsibilities (Boden et al., 2020; Rahman et al., 2021). Therefore, when people are truly worried about their uncertainties, they are less likely to utilize credit cards (Cornea, 2021). Credit card uptake, however, is not driven by how consumers perceive the losses associated with its use, according to several research (Boden et al., 2020; Rahman et al., 2021). Consumers prefer credit cards because of the bank's efforts, despite their reservations about the unintended consequences of using this form of payment instrument, according to Hussein et al. (2021).

2.6 Perceived Security (PS)

Because PS is so essential in users' technology-related activities, researchers have attempted to investigate the elements that influence PS. As a consequence, the study found that PS and PR, as well as credit cards' "mobile payment," were among the barriers to online purchases (Johnson et al., 2018). In terms of security issues, there is no discernible difference between the goal of mobile payment system security and that of traditional payment methods such as credit cards (Aydin and Burnaz, 2016). Furthermore, recent cryptographic breakthroughs have enabled all current payment systems, including mobile wallets and contactless credit/debit cards, to give a better level of financial transaction security (Crowe and Tavilla, 2012).

2.7 Consumer Intention to Use Credit Card (IUCC)

The paper presents a theoretical model of planned credit card activity based on consumer behavior and prior studies on the intention to use credit cards. According to studies, PU has an influence on customers' intentions to use credit cards (Cornea, 2021). PR and security, as well as privacy problems, are among the numerous strategies for employing PR in consumer intended usage of technology research (Featherman and Pavlou, 2003; Hanafizadeh and Khedmatgozar, 2012). Consumer preparedness to accept e-services is frequently seen as a major roadblock to TPR's fundamental concept, PR. E-services have been shown to have a detrimental impact on behavioral intentions (Cao and Niu, 2019). PEU, which has been established as a key driver of customer intention to utilize modern electronic services such as e-shopping, is another essential component in TAM (Chhonker et al., 2017), e-payment (Liu et al., 2019) and e-banking (Zhang et al., 2018; Liu et al., 2019). PEU has a direct impact on credit card usage intentions, according to empirical data, or has an indirect impact via PU mediating PEU (Rahman et al., 2021; Cornea, 2021). Furthermore, research has shown that social groupings have a direct impact on customers' behavioral intentions (Cao and Niu, 2019; Malaquias and Hwang, 2019).

3. Research Methodology

An online poll was used to obtain empirical data for this study, which was based on a review of existing studies related to the suggested theoretical model. Several terms were modified to match the credit card context. A five-point Likert scale was employed in the study, with 1 indicating "strongly disagree" and 5 indicating "strongly agree". A pre-test with three banking experts with experience in credit cards was conducted to ensure that the questionnaire was free of any semantic issues. As a consequence of the input, certain changes to the content and organization were made. The study included 250 participants from a handy sample of Saudi bank customers who are potential customers who are encouraged to register and use credit cards by the bank. Only 217 replies were valid and informative, and Hair et al. (2019) presented structural equation modeling (SEM) for experimentally evaluating the conceptual model of consumers' PS for credit card intention. The devices were then put through their paces with ten people who had previously paid bills using credit cards. As a consequence of the testing, the wordings were altered insignificantly. A final questionnaire, modified from, focuses on seven dimensions that connect to the recommended model and asks the following 26 questions: SI, PU, PEU, and consumer desire to use a credit card. Furthermore, perceived danger was adopted from (Javaria et al., 2020), PT from (Flavian et al., 2005), and PS was adapted from (Featherman and Pavlou, 2003).

4. Analysis and Results

The dependability coefficient of Cronbach's alpha was determined to be 0.911, suggesting that consumers' perceptions of risk and security influenced their tendency to use credit cards. According to the researchers, discriminant validity is determined by three criteria: The average variance extracted (AVE) for each construct must be equal to or more than 0.5, and the AVE square root of each construct must be larger than the Inter-Construct Correlations (IC) for a component (Hair et al., 2019). Construct variable analysis findings with factor loadings of 0.70 or above (Cronbach's alpha 0.70 and composite reliability 0.70) are acceptable due to the aforementioned variables (Hair et al., 2019).

4.1 Observation Validity of the construct

Construct validity refers to the extent to which individual elements decide the notion for which they were produced (Al-Rahmi et al., 2020). After a comprehensive examination of previously tested products in the literature, this was revealed. Table 1 outlines the components, as well as their loadings, that must be inserted into the build they were designed to measure (Hair et al., 2019).

Table 1. Item loadings and cross-loadings

Factors	Items	PR	PS	PT	PEU	PU	SI	IUCC
Perceived Risk	PR1	0.842550	0.542752	0.616645	0.530190	0.631589	0.598877	0.679574
	PR2	0.894792	0.578784	0.603466	0.575990	0.600492	0.613870	0.714732
	PR3	0.797420	0.545817	0.507464	0.425716	0.365565	0.476687	0.590582
	PR4	0.909468	0.594669	0.703759	0.542057	0.554894	0.627951	0.834124
Perceived Security	PS1	0.584529	0.866483	0.495707	0.498200	0.469936	0.578850	0.530468
	PS2	0.620583	0.847755	0.515802	0.452843	0.432204	0.557594	0.572096
	PS3	0.472201	0.859380	0.438550	0.363437	0.333935	0.516982	0.460652
	PS4	0.446416	0.891746	0.410945	0.322515	0.219362	0.328324	0.493864
PT	PT1	0.662034	0.552466	0.901417	0.554102	0.627336	0.668569	0.645843
	PT2	0.609979	0.528483	0.897453	0.548103	0.576766	0.619933	0.646979
	PT3	0.640910	0.456562	0.897111	0.547275	0.572819	0.623480	0.583223
PEU	PEU1	0.405473	0.384418	0.435518	0.791955	0.466745	0.510411	0.415022
	PEU2	0.525681	0.432789	0.530017	0.839782	0.635596	0.539212	0.505124
	PEU3	0.479460	0.398640	0.503486	0.794062	0.432850	0.453010	0.437240
	PEU4	0.531021	0.419137	0.504323	0.810730	0.589597	0.540567	0.443333
PU	PU1	0.527768	0.312965	0.544290	0.582781	0.849737	0.510843	0.489850
	PU2	0.592113	0.453472	0.579790	0.628006	0.911091	0.611671	0.504861
	PU3	0.476360	0.382380	0.559162	0.473365	0.779323	0.495089	0.398511
SI	SI1	0.593590	0.514329	0.657435	0.595761	0.626005	0.891737	0.566235
	SI2	0.559514	0.503505	0.557949	0.528861	0.535798	0.885807	0.569254
	SI3	0.653004	0.619735	0.680078	0.570172	0.549546	0.902499	0.615164
Intention to Use Credit Card	IUCC1	0.745221	0.611210	0.633076	0.492093	0.496201	0.604239	0.909225
	IUCC2	0.790728	0.584454	0.702038	0.586220	0.520977	0.579911	0.904783
	IUCC3	0.717955	0.540617	0.644187	0.484611	0.501706	0.575523	0.914796
	IUCC4	0.681296	0.566334	0.554760	0.384618	0.424010	0.544444	0.844627
	IUCC5	0.732941	0.507188	0.563609	0.532012	0.502407	0.610895	0.883810

Source: Author

4.2 Convergent Validity in Measurement

Because their factor loadings were more than 0.70, 26 components were deemed acceptable, with composite dependability ranging from 0.951015 to 0.883613. The Cronbach's alpha values varied from 0.935463 to 0.803607, indicating that the findings were good. The average values ranged from 0.807594 to 0.655061. The results of the Confirmatory Factor Analysis (CFA) (2019) are mentioned by Hair et al., see Table 2.

Table 2. Confirmatory Factor Analysis Results and Factor Loadings

Factors	Items	Factor loading	AVE	Composite Reliability	R Square	Cronbach's Alpha
PR	PR1	0.842550	0.743389	0.920364	0.592480	0.884173
	PR2	0.894792				
	PR3	0.797420				
	PR4	0.909468				
PS	PS1	0.866483	0.671632	0.890325	0.493271	0.834211
	PS2	0.847755				
	PS3	0.859380				
	PS4	0.891746				
PT	PT1	0.901417	0.807594	0.926427	0.000000	0.880992
	PT2	0.897453				
	PT3	0.897111				
PEU	PEU1	0.791955	0.655061	0.883613	0.000000	0.825146
	PEU2	0.839782				
	PEU3	0.794062				
	PEU4	0.810730				
PU	PU1	0.849737	0.719827	0.884748	0.521912	0.803607
	PU2	0.911091				
	PU3	0.779323				
SI	SI1	0.891737	0.798118	0.922236	0.000000	0.873709
	SI2	0.885807				
	SI3	0.902499				
IUCC	IUCC1	0.909225	0.795338	0.951015	0.693389	0.935463
	IUCC2	0.904783				
	IUCC3	0.914796				
	IUCC4	0.844627				
	IUCC5	0.883810				

Source: Author

4.3 Measurement Validity using Convergence

The differences between the collection of ideas and their metrics are referred to as discriminant validity. Both constructs' discriminant validity was confirmed with values more than 0.50 and significant at $p = 0.001$, as predicted by the study (Hair et al., 2019). The AVE square root shared by objects in a single concept should be smaller than the correlations between items in the two constructs, according to (Hair et al., 2019), as seen in Table 3.

Table 3. Discriminant validity

Factors	Items	IUCC	PEU	PR	PS	PT	PU	SI
IUCC	IUCC	1.000000						
PEU	PEU	0.558702	1.000000					
PR	PR	0.824045	0.604426	1.000000				
PS	PS	0.630746	0.506393	0.655716	1.000000			
PT	PT	0.696727	0.611910	0.710070	0.571789	1.000000		
PU	PU	0.549468	0.665567	0.630000	0.454338	0.660113	1.000000	
SI	SI	0.653978	0.633287	0.675857	0.613422	0.710056	0.638926	1.000000

Source: Author

4.4 The Analysis of the Structural Model

Smart PLS 2.0 was used to evaluate the study hypotheses and establish associations. Figure 1 depicts the hypothesis, Figure 2 depicts the path coefficient results, and Figure 3 depicts the path coefficient (T-Values) discoveries.

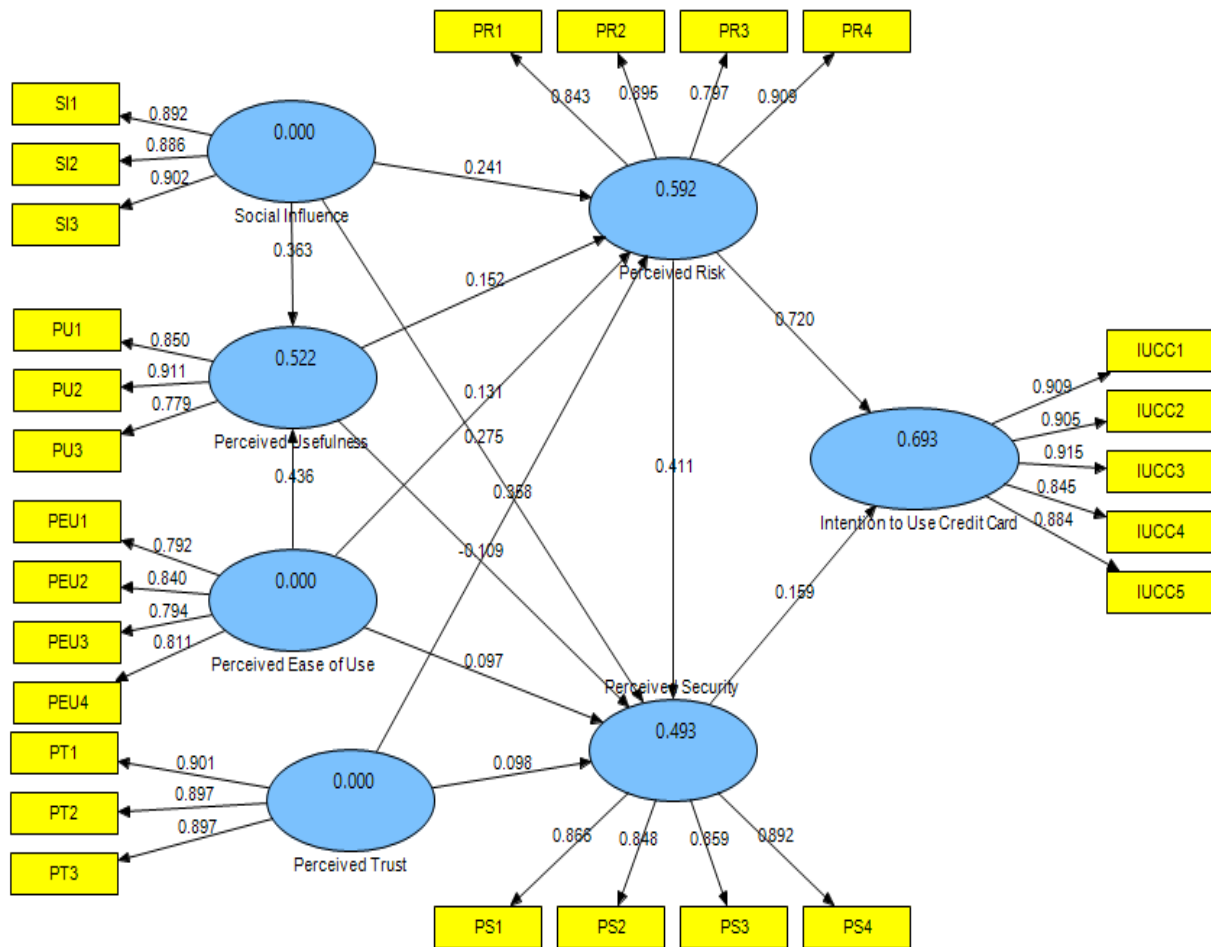


Figure 2. Path Coefficient Findings

Source: Author

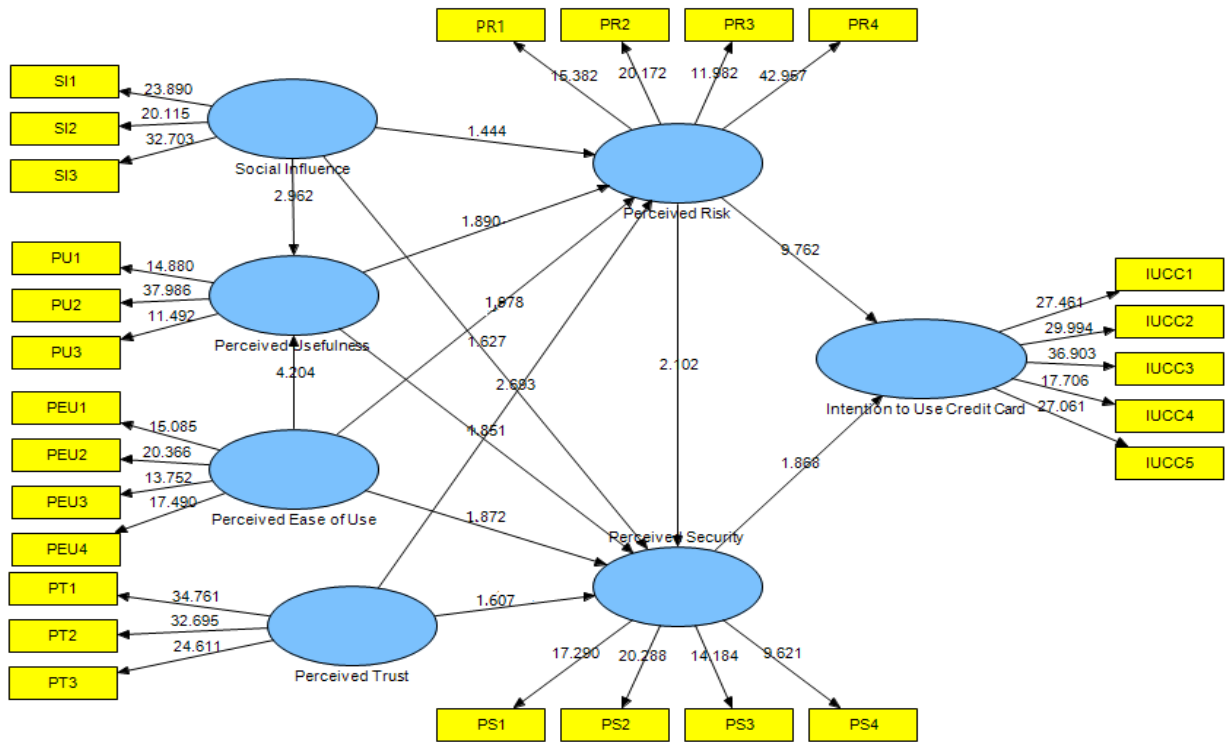


Figure 3. Path T-Values Findings

Source: Author

Table 4. Hypotheses Testing

Path of Hypotheses	Path Coefficient	Standard Error (SE)	T Statistics	Results
SI -> PR (H1)	0.241358	0.167089	1.444491	Accepted
SI -> PS (H2)	0.274663	0.168857	1.626604	Accepted
SI -> PU (H3)	0.363021	0.122562	2.961949	Accepted
PU -> PR (H4)	0.152125	0.139451	1.890487	Accepted
PU -> PS (H5)	0.108903	0.127987	1.851494	Accepted
PEU -> PU (H6)	0.435670	0.103633	4.203969	Accepted
PEU -> PR (H7)	0.131312	0.103500	1.978319	Accepted
PEU -> PS (H8)	0.096874	0.111065	1.872230	Accepted
PT -> PR (H9)	0.357922	0.132919	2.692773	Accepted
PT -> PS (H10)	0.097704	0.160737	1.607846	Accepted
PR -> PS (H11)	0.410762	0.195427	2.101866	Accepted
PR -> IUCC (H12)	0.720050	0.073760	9.762067	Accepted
PS -> IUCC (H13)	0.158598	0.084888	1.868326	Accepted

Source: Author

Table 4 summarizes the outcomes of the study, showing all correlations and their significance. The relationship between SI -> PR (H1) ($\beta = 0.241358$, $SE = 0.167089$, $T = 1.444491$), thus, hypothesis number 1 was accepted. The relationship between SI -> PS (H2) ($\beta = 0.274663$, $SE = 0.168857$, $T = 1.626604$), thus, hypothesis number 2 was accepted. The relationship between SI -> PU (H3- $\beta = 0.363021$, $SE = 0.122562$, $T = 2.961949$), thus, hypothesis number 3 was accepted. Next the relationship between PU -> PR (H4- $\beta = 0.152125$, $SE = 0.139451$, $T = 1.890487$), thus, hypothesis number 4 was accepted. Also, the relationship between PU -> PS (H5- $\beta = 0.108903$,

SE=0.127987, T=1.851494), thus, hypothesis number 5 was accepted. Similarly, the relationship between PEU -> PU (H6- β = 0.435670, SE=0.103633, T=4.203969), thus, hypothesis number 6 was accepted. And the relationship between PEU -> PR (H7- β = 0.131312, SE=0.103500, T=1.978319), thus, hypothesis number 7 was accepted. Likewise, the relationship between PEU -> PS (H8- β = 0.096874, SE=0.111065, T=1.872230), thus, hypothesis number 8 was accepted. Additionally, the relationship between PT -> PR (H9- β = 0.357922, SE=0.132919, T=2.692773), thus, hypothesis number 9 was accepted. And the relationship between PT -> PS (H10- β = 0.097704, SE=0.160737, T=1.607846), thus, hypothesis number 10 was accepted. Moreover, the relationship between PR -> PS (H11- β = 0.410762, SE=0.195427, T=2.101866), thus, hypothesis number 11 was accepted. Also, the relationship between PR -> intention to use credit card (H12- β =0.720050, SE=0.073760, T=9.762067), thus, hypothesis number 12 was accepted. Finally, the relationship between PS -> intention to use credit card (H13- β = 0.158598, SE=0.084888, T=1.868326), thus, hypothesis number 13 was accepted.

5. Implementation and Discussion

The goal of this study was to see how people's risk and security perceptions impacted their willingness to use credit cards. The study looked at how four exogenous factors (SI, PEU, PU, and PT) and two endogenous variables (PR and PS) influenced customer IUCC using standard technology adoption theories. The findings of hypothesis testing for the research model, including the path coefficients and their significant values, are shown in Table 4 and Figures 2 and 3. First, the intended expectations of customers for credit card event losses were compared to prior PR and PS studies (Rahman et al., 2021; Boden et al., 2020; Cornea, 2021). PR and PS, according to the CFA findings, is a second-order reflective construct linked to seven first-order risk dimensions, including SI, PEU, PU, and PT. Previous study has considered PR as a one-dimensional construct (Rahman et al., 2021; Cornea, 2021) or two one-dimensional constructs (Rahman et al., 2021; Cornea, 2021; Boden et al., 2020). The strongest relationship between the IUCC and PEU, SI and PU, PT and PR, and PR and PS, according to the SEM research, was PR. This study is unusual in the field of credit card adoption in Saudi Arabia since it uses a theoretical model to assess the factors that influence consumers' willingness to use credit cards, such as TPR theory (Bauer, 1960), PU, PEU, and SI from TAM (Davis et al., 1989), TPB (Ajzen, 1991), and UTAUT theory (Venkatesh et al., 2003). This research might be useful to banks as they design new customer acquisition tactics and decide how to spend resources to retain and grow their existing client base. As a result of the findings, banks should concentrate their efforts on risk and security problems, which might help them attract new customers. Banks may encourage customers to own and use credit cards to pay for products and services depending on factors influencing their credit card use intentions. Money-back guarantees are another excellent risk-reduction strategy that may help clients feel more at ease and safe with the system. Banks and other stakeholders should upgrade credit cards with more useful features and services, as well as simplify credit card payment methods, in the ever-changing business environment. By defining or enhancing transactional procedures or relevant services, banks may take advantage of the positive impacts of PT, utility, simplicity of use, and SI on credit card acceptance. As a consequence, they will be willing to accept credit card issuers' offers and urge individuals in Saudi Arabia and other nations to use credit cards. As a result, this research has theoretical as well as practical implications. Modeling and deconstructing PR and security as a reflecting second-order construct into four first-order risk dimensions: SI, PT, PU, and PEU was the study's unique theoretical contribution. Second, the findings of the study contributed empirical data and a theoretical component to the academic research platform on e-banking services in Saudi Arabia, particularly in the credit card business. Finally, the study adds to the body of knowledge on consumer behavior by verifying the effects of PR and PS on the IUCC in Saudi Arabia, which most prior studies had ignored.

Conclusion and future work

This study found that PR and security are second-order attributes connected to four first-order risk dimensions: PT, PU, PEU, and SI, based on data from 217 bank clients. PR and PS had the greatest impact on credit card usage intentions, followed by PT, SI, PU, and PEU, in that order. As a consequence of all of these factors, consumers are urged to utilize credit cards. Credit card PU is also influenced by PEU and SI. All studies have faults that must be addressed, regardless of their contributions to the literature, practical, theoretical, or methodological applications. Our findings are exclusive to Saudi Arabia, although they are comparable to other IS and mobile e-services research. To gain a better understanding of how the elements interact over time and encourage people in Saudi Arabia and other countries to use credit cards, a longitudinal study on our methodology would be ideal. Other characteristics such as service quality, familiarity, mobile Skill, and anxiousness may be added in future study to increase explanatory power. Based on the respondent's educational background, our widely circulated questionnaire looks to be limited to the more educated and technically capable sectors of society, who would be more inclined to embrace e-services applications. As a result, researchers concerned in the adoption and sustainability of e-services should focus their efforts on the underbanked population, where illiteracy may be the norm.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211. <https://doi.org/10.4135/9781412952576.n208>
- Ala'raj, M., Abbod, M. F., & Majdalawieh, M. (2021). Modelling customers credit card behaviour using bidirectional LSTM neural networks. *Journal of Big Data*, 8(1), 1-27. <https://doi.org/10.1186/s40537-021-00461-7>
- Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, 37(3), 99-110. <https://doi.org/10.1016/j.ijinfomgt.2017.01.002>
- Al-Saedi, K., Al-Emran, M., Ramayah, T., & Abusham, E. (2020). Developing a general extended UTAUT model for M-payment adoption. *Technology in Society*, 62, 101293. <https://doi.org/10.1016/j.techsoc.2020.101293>
- Aydin, A. E. (2021). Psychological and demographic factors influencing responsible credit card debt payment. *Journal of Financial Services Marketing*, 1-10. <https://doi.org/10.1057/s41264-021-00094-0>
- Aydin, G., & Burnaz, S. (2016). Adoption of mobile payment systems: A study on mobile wallets. *Journal of Business Economics and Finance*, 5(1), 73-92. <https://doi.org/10.17261/pressacademia.2016116555>
- Bauer, R.A. (1960). *Consumer Behavior as Risk Taking, Dynamic Marketing for a Changing World*, American Marketing Association, Chicago.
- Boden, J., Maier, E., & Wilken, R. (2020). The effect of credit card versus mobile payment on convenience and consumers' willingness to pay. *Journal of Retailing and Consumer Services*, 52, 101910. <https://doi.org/10.1016/j.jretconser.2019.101910>
- Cao, Q., & Niu, X. (2019). Integrating context-awareness and UTAUT to explain Alipay user adoption. *International Journal of Industrial Ergonomics*, 69, 9-13. <https://doi.org/10.1016/j.ergon.2018.09.004>
- Chhonker, M. S., Verma, D., & Kar, A. K. (2017). Review of technology adoption frameworks in mobile commerce. *Procedia computer science*, 122, 888-895. <https://doi.org/10.1016/j.procs.2017.11.451>
- Cornea, D. (2021). Credit card payments: do cultural values matter? Evidence from the European Union. *Managerial Finance*. <https://doi.org/10.1108/mf-06-2020-0336>
- Crowe, M., & Tavilla, E. (2012). Mobile Phone Technology: "Smarter than We Thought" How Technology Platforms Are Securing Mobile Payments in the U.S. Retrieved from. <https://www.bostonfed.org/publications/payment-strategies/mobile-phone-technology-smarter-than-we-thought-how-technology-platforms-are-securing-mobile-payments-in-the-us.aspx>
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management science*, 35(8), 982-1003. <https://doi.org/10.1287/mnsc.35.8.982>
- Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International journal of human-computer studies*, 59(4), 451-474. [https://doi.org/10.1016/s1071-5819\(03\)00111-3](https://doi.org/10.1016/s1071-5819(03)00111-3)
- Fishbein, M. & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading. <https://doi.org/10.2307/2065853>
- Flavián, C., Guinaliú, M., & Torres, E. (2005). The influence of corporate image on consumer trust: A comparative analysis in traditional versus internet banking. *Internet research*. <https://doi.org/10.1108/10662240510615191>

- Hair, J. F., Risher, J., Sarstedt, M., & Ringle, C. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/eb-11-2018-0203>
- Hanafizadeh, P., & Khedmatgozar, H. R. (2012). The mediating role of the dimensions of the perceived risk in the effect of customers' awareness on the adoption of Internet banking in Iran. *Electronic Commerce Research*, 12(2), 151-175. <https://doi.org/10.1007/s10660-012-9090-z>
- Hassan, M. T., Mukhtar, A., Ullah, R. K., Shafique, H., Rehmana, S. U., & Anwar, A. (2012). Customer service quality perception of internet banking. *International Journal of Learning & Development*, 2(2), 86-100. <https://doi.org/10.5296/ijld.v2i2.1591>
- Hussein, A. S., Khairy, R. S., Najeeb, S. M. M., & ALRikabi, H. T. (2021). Credit Card Fraud Detection Using Fuzzy Rough Nearest Neighbor and Sequential Minimal Optimization with Logistic Regression. *International Journal of Interactive Mobile Technologies*, 15(5). <https://doi.org/10.3991/ijim.v15i05.17173>
- Jamshidi, D., & Kuanova, L. (2020). Investigating the customers' drivers of Islamic credit card loyalty and word of mouth. *Journal of Islamic Marketing*. <https://doi.org/10.1108/jima-09-2019-0182>
- Javaria, K., Masood, O., Garcia, F. 2020. Strategies to manage the risks faced by consumers in developing e-commerce. *Insights into Regional Development*, 2(4), 774-783. [http://doi.org/10.9770/IRD.2020.2.4\(4\)](http://doi.org/10.9770/IRD.2020.2.4(4))
- Johnson, V. L., Kiser, A., Washington, R., & Torres, R. (2018). Limitations to the rapid adoption of M-payment services: Understanding the impact of privacy risk on M-Payment services. *Computers in Human Behavior*, 79, 111-122. <https://doi.org/10.1016/j.chb.2017.10.035>
- Jung, K., & Kang, M. Y. (2021). Understanding Credit Card Usage Behavior of Elderly Korean Consumers for Sustainable Growth: Implications for Korean Credit Card Companies. *Sustainability*, 13(7), 3817. <https://doi.org/10.3390/su13073817>
- Kang, G. D., & James, J. (2004). Service quality dimensions: an examination of Grönroos's service quality model. *Managing Service Quality: An International Journal*. <https://doi.org/10.1108/09604520410546806>
- Lebichot, B., Paldino, G. M., Siblini, W., He-Guelton, L., Oblé, F., & Bontempi, G. (2021). Incremental learning strategies for credit cards fraud detection. *International Journal of Data Science and Analytics*, 1-10. <https://doi.org/10.1007/s41060-021-00258-0>
- Lee, J. M., & Lee, Y. G. (2021). Multidimensional credit attitude and credit card debt behavior in the United States. *Review of Behavioral Finance*. <https://doi.org/10.1108/rbf-09-2020-0239>
- Liu, Y., & Dewitte, S. (2021). A replication study of the credit card effect on spending behavior and an extension to mobile payments. *Journal of Retailing and Consumer Services*, 60, 102472. <https://doi.org/10.1016/j.jretconser.2021.102472>
- Liu, Z., Ben, S., & Zhang, R. (2019). Factors affecting consumers' mobile payment behavior: a meta-analysis. *Electronic Commerce Research*, 19(3), 575-601. <https://doi.org/10.1007/s10660-019-09349-4>
- Malaquias, R. F., & Hwang, Y. (2019). Mobile banking use: A comparative study with Brazilian and US participants. *International Journal of Information Management*, 44, 132-140. <https://doi.org/10.1016/j.ijinfomgt.2018.10.004>
- Ngonga, M. (2015). *Electronic Banking and Financial Performance: Jomo Kenyatta University of Agriculture and Technology*. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.731.2828&rep=rep1&type=pdf>
- Pelaez, A., Chen, C. W., & Chen, Y. X. (2019). Effects of perceived risk on intention to purchase: A meta-analysis. *Journal of Computer Information Systems*, 59(1), 73-84. <https://doi.org/10.1080/08874417.2017.1300514>
- Prusti, D., Das, D., & Rath, S. K. (2021). Credit Card Fraud Detection Technique by Applying Graph Database Model. *Arabian Journal for Science and Engineering*, 1-20. <https://doi.org/10.1007/s13369-021-05682-9>
- Rahman, T., Noh, M., Kim, Y. S., & Lee, C. K. (2021). Effect of word of mouth on m-payment service adoption: a developing country case study. *Information Development*, 0266666921999702. <https://doi.org/10.1177/0266666921999702>
- Roy, S. K., Balaji, M. S., Kesharwani, A., & Sekhon, H. (2017). Predicting Internet banking adoption in India: a perceived risk perspective. *Journal of Strategic Marketing*, 25(5-6), 418-438. <https://doi.org/10.1080/0965254x.2016.1148771>
- Trinh, N. H., Tran, H. H., & Vuong, Q. D. H. (2021). Perceived Risk and Intention to Use Credit Cards: A Case Study in Vietnam. *The Journal of Asian Finance, Economics and Business*, 8(4), 949-958. <https://doi.org/10.1108/ajeb-06-2020-0018>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478. <https://doi.org/10.2307/30036540>
- Yuan, Y., Rong, Z., Xu, N., & Lu, Y. (2021). Credit cards and small business dynamics: Evidence from China. *Pacific-Basin Finance Journal*, 67, 101570. <https://doi.org/10.1016/j.pacfin.2021.101570>
- Zhang, Y., Weng, Q., & Zhu, N. (2018). The relationships between electronic banking adoption and its antecedents: A meta-analytic study of the role of national culture. *International Journal of Information Management*, 40, 76-87. <https://doi.org/10.1016/j.ijinfomgt.2018.01.015>

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DETERMINANTS OF THE HUMAN CAPITAL REDISTRIBUTION. WHAT PUSHES OUT AND WHAT PULLS TO THE REGIONS OF MASOVIAN VOIVODSHIP*

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Abstract. Increase in human capital is one of the paths to sustainable development. The issue of determinants of redistribution, concentration and dispersion of human capital has been a research topic undertaken by representatives of broadly understood social sciences. It is worth mentioning that one of the basic factors determining the concentration of the discussed resources, as well as their dispersion, are the processes of population migration, which are a derivative of, inter alia, the differentiation of the attractiveness of particular areas. This paper deals with the issue of the level of human capital as one of the key determinants of the socio-economic development of Mazovia. The main aim of this paper is to diagnose the factors pushing out of and attracting human resources to the regions of the Masovian Voivodship. The survey on a representative sample of $n=1,233$ employers whose business activity is registered in the Warsaw capital region and Mazowieckie region (NUTS 2) was carried out using two research techniques: CATI and CAWI. Statistical inference was carried out using non-parametric tests. The relationships between the variables were tested with the χ^2 test. The Mann-Whitney U test was used to study the relationship between two independent groups. This paper indicates the key factors pushing human resources out of individual regions and the factors that, according to employers, encourage people to settle in the Warsaw capital region and Mazowieckie region. Particular attention was paid to factors related to the availability of educational institutions, health care facilities, cultural institutions, the level of wages, costs of living, investment attractiveness and the so-called environmental values.

Keywords: human capital, migration; push and pull factors; Masovian Voivodship; regions

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JEL Classifications: E24, R23, O15

1. Introduction

In economic sciences, changes taking place in the economy are perceived from the aspect of economic growth and socio-economic development. One of the most important determinants of those changes is human capital available in the economy of a country or a single individual region (Kijek, Matras-Bolibok, 2020).

Determinants of redistribution, concentration and dispersion of human capital still remain a popular research topic undertaken by representatives of broadly understood social sciences. It is worth noting here that the process of population migration is one of the basic factors determining the concentration and dispersion of human capital. Migration itself results from many factors with the diversification of the attractiveness of individual economic regions being the most important one.

It should be emphasized that there are numerous barriers to objective measurement of human capital levels. There are commonly accepted indicators used to measure it, but significant differences exist between those indicators, especially when various levels of analysis are considered to compare countries or regions and to analyse human capital within them. Therefore, one of the important research challenges is the diagnosis of the determinants of the level of human capital in particular areas.

This study concerns the human capital level as one of the key determinants of the socio-economic development of Mazovia and we emphasized its significant dispersion. Therefore the aim of our research was to diagnose the factors pushing out and attracting human resources to individual regions of the Masovian Voivodship. A survey method on a representative sample of $n = 1233$ employers whose business activity at the time of conducting research was registered in the Warsaw capital region and Mazowieckie region (NUTS 2) was adopted and performed using two research techniques: CATI (Computer Assisted Telephone Interview) and CAWI (Computer Assisted Web Interview). The obtained data made it possible to diagnose the key determinants of the differentiation of the level of human capital in individual regions of the Masovian Voivodship and to answer the research question posed in the title of this article: what pushes and what attracts people to particular areas of the voivodship under study?

The second part of this paper presents the results of the literature review in the field of determinants of the level of human capital and its importance in the context of growth and economic development of regions.. Moreover, various theories of population migration are briefly discussed. Research methodology is then explained in the third section, including sampling process, the course of the study and the scope of activities aimed at ensuring high quality and reliability of the obtained data. This is followed by interpretation of results. The whole study ends with a summary and a comparison with results obtained in other research initiatives.

2. Theoretical background

Adam Smith was the first to mention human capital and analysed it in the context of acquiring talents during the education process, which leads to the subsequent enrichment of society. However, T.W Schulz (1961) and G.S Becker (1962) were the first to use this concept in the literature. The considerations of T.W Schulz indicated the importance of the concept of human capital in the context of explaining certain economic anomalies. He actually emphasized the importance of human capital and considered it as another factor, next to labour, land and capital that influences economic growth (Goldin, 2019). T.W. Schulz saw investment in human capital primarily as expenditure on education and health care, paying attention to the importance of broadly understood migration processes (Schultz, 1961). G.S. Becker had a similar view. He claimed that investments in education and health

protection, as well as gaining experience during work are in fact investments in human capital (Dańska-Borysiak, Laskowska, 2016, pp. 31-44). In his research, he pointed out, among other things, the influence of education and professional experience on the level of earnings (see Becker, 1962).

The roles of human capital in the context of regional development have been well described in the works of R. Lucas. He created two versions of the human capital model, differing in the ways in which an individual accumulates this capital (see Herbst, 2007, pp. 28). In addition, N.G. Mankiw, D. Romer and D. Weil (1992) made their contribution by taking into account the process of accumulation of human capital using Solov model. On the other hand, D. Romer argued that human capital resources are the key factors influencing the development of the economy. In the endogenous growth model, he indicated that the initial level of human capital enables the prediction of the investment rate and indirectly influences the future rate of income growth (Romer, 1989; Zajączkowska-Jakimiak, 2006, pp. 47-69). Moreover, D. Romer's model assumed the existence of four production factors: physical capital, labor, human capital and technology (see Przygodzki, 2019, pp. 105-130). The views of both R. Lucas and D. Romer was continued by C.I. Jones. In his concept, human capital is a condition for the development of technology, while the technologies themselves contribute to economic growth and further increase in the level of human capital (see Niedzielski et al., 2009, p. 318).

In deliberations on the theory of human capital, it should also be mentioned R. Florida, who in the model of the creative class indicated that the concentration of human capital is more important than the concentration and number of enterprises in a given area (see Florida, 2002, p. 221). It is also worth mentioning the unified theory of economic growth by O. Galor. It shows the key role of human capital in contemporary development processes. In this theoretical approach, the accumulated human capital is perceived as the engine of economic development (Przygodzki, 2019, pp. 105-130).

Despite some differences in the way the human capital is perceived and understood, it has been agreed that it has certain undeniable features (Kuc-Czarnecka, 2019). It is intangible and may change in the process of education and gaining professional experience (Bartnik, 2016, p. 7-26). The theoretical concepts presented in this study also allow to indicate a clear relationship between the level of human capital and the level of economic development achieved. As noted by Z. Przygodzki (2019, p. 105-130) on the basis of the theory of growth, there is agreement among individual authors that in order to achieve long-term economic growth, traditional factors of production are not sufficient.

Among the numerous research initiatives focused on the issue of human capital, a number of works presenting the results of research on its relationship with socio-economic development as well as regional and local development can be indicated. Some of them are listed below (Table 1).

Table 1. Review of literature

Publication	Main conclusions from the conducted research
(Outreville, 1999)	There is a strong positive correlation between financial development measures and the level of human capital.
(Lee, <i>et al.</i> , 2002, pp. 879-891)	In the context of migration, regions characterized by high openness and social differentiation are more likely to attract human capital.
(Williams, <i>et al.</i> , 2004, pp. 27-46)	The carriers of human capital are individuals who migrate. In addition, researchers point to the need to include the issues of migration and human capital mobility into the debate about the knowledge-based economy and self-learning regions.
(Faggian & McCann, 2009)	The migration of human capital influences the diversification of the nature of its development. The biggest beneficiaries of migration are metropolises that attract human capital.
(Gennaioli, <i>et al.</i> , 2013, pp. 105-164)	Collected evidence from 1.500 regions of each country shows a relationship between the level of education and the achieved level of development of a region. Highly educated employees and entrepreneurs increase productivity.
(Tselios, <i>et al.</i> , 2017)	Two factors strongly influencing the economic development of Greece are human capital (i.e. education) and transport infrastructure (i.e. road and rail).
(Diebolt & Hippe, 2018, pp. 542-563)	From the perspective of historical data from 1850-1960, human capital was the most important factor influencing the number of patent applications per capita. Human capital is an indicator of the current disproportions in the development of individual regions in Europe.

Source: compiled by the authors

When considering the level of human capital and its impact on the socio-economic development of regions, the process of population migration needs to be taken into account. The phenomenon of migration determines the size of the labour resources available in a given economy, and thus affects the structure of society from the point of view of such features as the level of education or age. The migratory movement of the population must therefore be understood as the displacement of human resources, and thus also of the human capital accumulated by each individual.

The relationship between different migration theories should also be emphasized with the issue of economic growth and development of regions experiencing the phenomenon of population migration. Theory of migration derived from Neoclassical Economics are useful in explaining the mechanism of economic migration and its various consequences for both areas, between which migration takes place (see Harris & Todaro, 1970; Massey, *et.* 2006). There is also a dual labour market theory, which indicates the most important reasons for the occurrence of demand for external labour resources, understood as a natural phenomenon that occurs at a certain stage of socio-economic development (see Doeringer, Piore, 1971; Piore, 1979).

Selected migration theories may find their application in research on the determinants of the level of human capital and thus also in the socio-economic development of regions. An example of such an approach is "Push-Pull Factors Theory" by E.S. Lee. According to this theory, there are factors that encourage or discourage making migration decisions and can be noted both on the side of the place of origin and the destination of a possible migration. Importantly and unfortunately quite often overlooked in analyses of migration theory, there are also factors that are neutral in nature (Lee, 1966). In this context, it seems that research tools used to diagnose features that push out from a given area and features that attract people to a given area, and thus influencing the level of its development may to a large extent be based on the assumptions of the discussed theoretical approach.

3. Research objective and methodology

The primary aim of the study was to identify push factors and those that attract human resources to individual regions of the Masovian Voivodship (analysis at the level of NUTS 2 units). In the first stage of designing the research methodology, a selection was made of the main factors that may attract human resources or contribute to

stimulating the phenomenon of emigration from a given area, thus constituting determinants of the level of socio-economic development. The list of selected determinants is presented below (Table 2).

Table 2. Selected determinants of the level of socio-economic development

Push factor / pull factor	References
Availability of educational institutions (EDU)	(Pritchett, 2001, pp. 367-391); (Horii, <i>et al.</i> , 2008, pp. 156-177); (Aghion, <i>et al.</i> , 2009, pp. 1-73); (Donou-Adonsou, 2019, pp. 353-360).
Availability and level of healthcare (HEALTH)	(Alhowaish, 2014, pp. 1471-1476); (Bedir, 2016, pp. 76-86); (Som, 2019, pp. 45-57).
Number of jobs (JOB)	(Seyfried, 2005, pp. 13-24); (Akcoraoglu, 2010, pp. 101-114); (Simionescu, <i>et al.</i> , 2017, pp. 103-116).
The level of earnings (WAGE)	(Pasinetti, 1962, pp. 267-279); (Bilan, <i>et al.</i> , 2017, pp. 208-214); (Amri, 2018, pp. 163-176).
Costs of living (COST)	(Bove & Elia, 2017, pp. 227-239); (Humphries & Weistorf, 2019, pp. 1-21).
Environmental / recreational values (ENVIR)	(Grossman & Krueger, 1995, pp. 353-377); (Panayotou, 2016, pp. 140-148); (Khoshnevis & Khanalizadeh, 2017, pp. 1181-1190).
Level of communication with important centers (COMMUN)	(Herranz-Loncán, 2007, pp. 452-468); (Banerjee, <i>et al.</i> , 2012); (Toader, <i>et al.</i> , 2018).
Accessibility of utility infrastructure (UTIL)	(Cutanda & Paricio, 1994, pp. 69-74); (Jerome, 2011, pp. 127-151); (Palei, 2015, pp. 168-175); (Tian & Li, 2019, pp. 3332-3348).
Accessibility of cultural institutions (CULTUR)	(Bakhshi, <i>et al.</i> , 2015); (Angelini & Castellani, 2019, pp. 173-188); (Wiśniewska, <i>et al.</i> , 2020, pp. 563-587).

Our survey was conducted on a representative sample of business owners registered in the Warsaw capital region and Mazowieckie region (NUTS 2). We used two research techniques: CATI (Computer Assisted Telephone Interview) and CAWI (Computer Assisted Web Interview). It should be kept in mind that not only employers have a wide range of knowledge about the factors that attract and push human resources out of a given area. In this study, however, a decision was made about assigning them to a role of respondents. It was dictated by the fact that employers conducting business activity in a given region often have expert knowledge on the widely understood level of attractiveness of a given area, which may ensure a relatively high value of the results obtained.

Samples were stratified and randomized. The region was the layer in the NUTS 2 statistical division. The following parameters were adopted: confidence level =0.95, proportion of the phenomenon in the general population P=50%, maximum estimation error e=4%. In order to determine the minimum size of a representative sample in individual strata, the formula was used:

$$n = \frac{N(Z^2 * P(1 - P))}{N * e^2 + Z^2 * P(1 - P)}$$

n = sample size;

N = population size;

e = the maximum allowable error of estimation;

P = estimated proportion in the population;

Z = value of Z resulting from the adopted confidence level (0.95).

Using the Local Data Bank of the Central Statistical Office, the number of entities of the national economy registered in individual regions within Masovian Voivodship was determined:

Warsaw capital region N1 = 495.190;

Mazowieckie region N2 = 154.908 (as of August 18, 2020).

The minimum size of a representative research sample was calculated in the regions:

NUTS 2 Warsaw capital region:

$$600 = \frac{495190(1,96^2 * 0,5(1 - 0,5))}{495190 * 0,04^2 + 1,96^2 * 0,5(1 - 0,5)}$$

NUTS 2 Mazowieckie region:

$$598 = \frac{154908(1,96^2 * 0,5(1 - 0,5))}{154908 * 0,04^2 + 1,96^2 * 0,5(1 - 0,5)}$$

In total, 631 respondents took part in the survey from the Warsaw capital region, and 602 respondents from Mazowieckie region. The survey was carried out between September 21 and October 23, 2020. Out of all 1233 interviews, 860 interviews were conducted using the CATI technique, and 373 interviews were conducted using the CAWI technique. During the study, the work of the interviewers was controlled. The field control method was used, consisting in the ongoing wiretapping during the interviews and non-field control, consisting in a comprehensive analysis of the database aggregating the results of the study.

During the audit, the following were verified:

- the fact of the interview taking place;
- the fact of conducting an interview with the appropriate employer;
- the fact of asking all the questions contained in the questionnaire;
- correctness of the use of filtering questions;
- correctness of asking questions (as stated in the questionnaire, without changing the wording, translating questions, forcing answers);
- substantive correctness of asking questions.

95 phone call conversations were analysed, which accounted for over 11% CATI interviews and all CAWI interviews. The interviews were conducted by 12 interviewers, all of them were controlled by telephone wiretapping. The interviewers who found irregularities during the wiretapping were informed about it on an ongoing basis and instructed on the appropriate manner of conducting the interviews. The mistakes made by them were corrected.

Non-field control of the study was conducted in order to verify the correctness of the respondents' answers. The

subject of the audit was the database of the results of the study, which was verified in terms of:

- correctly entered respondents' answers to semi-open questions (without using abbreviations, incomplete entries);
- correct marking of respondents' answers in closed questions;
- substantive/logical answers.

Thanks to the use of two methods of quality control of the research implementation, potential errors and shortcomings were significantly reduced, which contributed to the quality of the results obtained in the empirical study.

3. Results and discussion

In our survey we asked respondents to analyse the proposed set of factors in the context of their role in attracting or pushing human resources out of a given region. In accordance with the assumptions of the previously quoted "Push and Pull Factors Theory" by E. Lee, the respondents were also given the option to describe the factor as "neutral", which is understood as having no effect.

It is worth noting that the collective analysis of the responses, without taking into account the division according to NUTS 2 units, authorizes the statement that the surveyed employers more often pointed to the attracting role of the factors proposed in the cafeteria, which may indicate that they see many advantages of the area in which they conduct their business. The only factor with a similar number of positive and negative responses (with a difference of 5 percentage points) was the cost of living. The most indications for the neutrality of the factor were those related to availability and level of healthcare (46.6%), availability of educational institutions (46.6%) and cultural institutions (40.9%). List of respondents' responses according to their geographical location (either Warsaw capital region or Mazowieckie region) is presented in Figure 1.

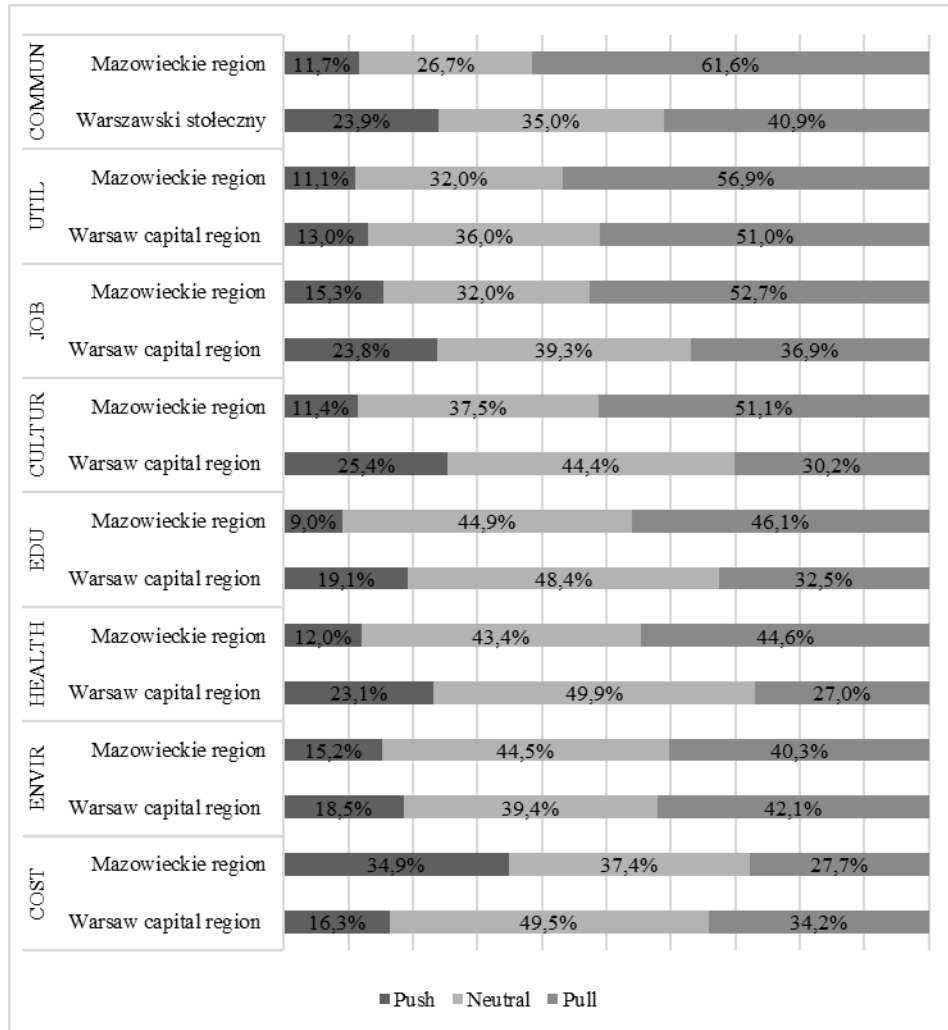


Figure 1. Factors pushing out of and attracting human capital to the regions of the Masovian Voivodship

Source: own study based on the results of the CATI and CAWI survey on a sample of n = 1,233 employers.

Among the most often referred to as attractants, respondents from NUTS 2 Warsaw capital region indicated the level of communication with important centres (COMMUN), the accessibility of utility infrastructure (UTIL), the number of jobs (JOB) and the accessibility of cultural institutions (CULTUR). Each of the above-mentioned factors was indicated as attractive by over half of the respondents from the discussed region. In the opinion of employers from NUTS 2 Mazowieckie region, the attracting factors were dominated by the availability and level of health care (HEALTH) and the costs of living (COST).

In order to observe differences between the regions under study, employers were divided into two categories. This division was separate and exhaustive, meaning that each participant could be assigned to only one category. Statistical inference was performed using non-parametric tests due to the ordinal level of measurement of variables and their qualitative nature at most. The relationships between the variables were tested with the independence test χ^2 . U Mann-Whitney tests were performed to investigate the relationships between two independent groups. The significance level adopted for each test was 0.05. Table 3 presents the results of the performed statistical analysis.

Table 3. Results of the performed statistical analysis

Test	EDU	HEALTH	JOB	WAGE	COST	ENVIR	COMMUN	UTIL	CULTUR
U Mann-Whitney	128263.500	131481.000	130370.500	120673.000	142419.500	170519.500	127489.500	147424.000	116520.000
W Wilcoxon	285343.500	297081.000	286890.500	276076.000	322119.500	334970.500	289654.500	305065.000	278116.000
Z	-6.340	-7.490	-6.011	-7.906	-4.598	-.511	-8.057	-3.119	-8.994
Asymptotic significance (two-sided)	.000	.000	.000	.000	.000	.609	.000	.002	.000

a. Grouping variable: NUTS 2

Source: own study based on the results of the CATI and CAWI survey on a sample of n=1,233 employers.

There are statistically significant differences between NUTS 2 regions for 8 factors, no significance was observed for environmental/recreational values (ENVIR). The value of the difference in the share of respondents' indications on the attracting and pushing role of specific factors, expressed in percentage points, is shown in Figure 2.

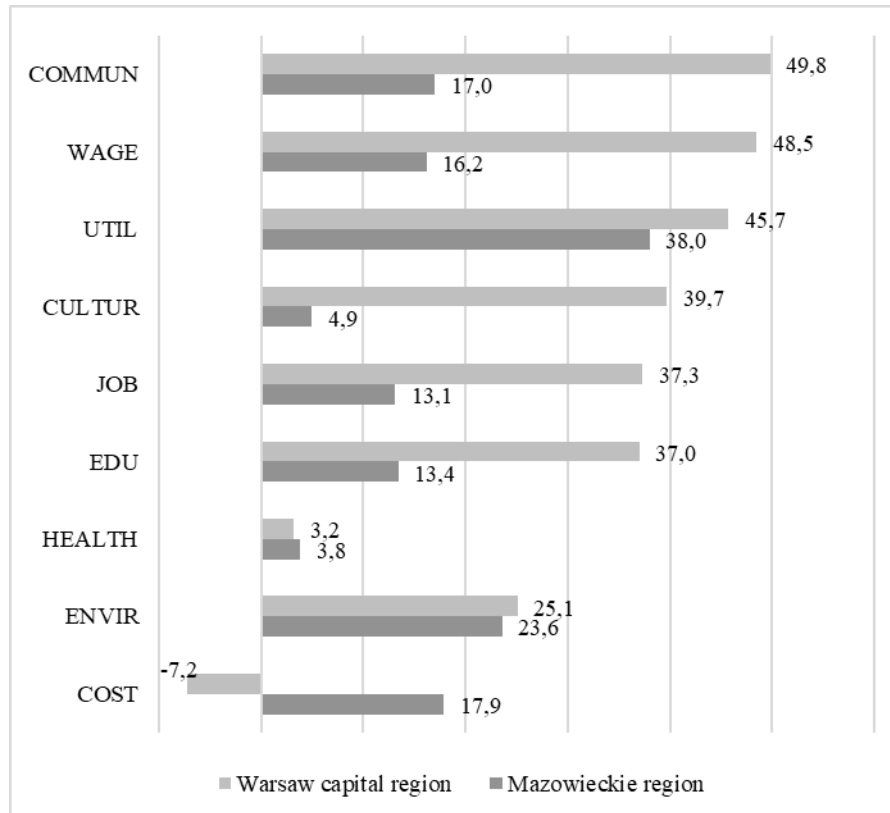


Figure 2. The difference (percentage points) between the responses indicating that a given factor attracts or pushes human capital out of the region

Source: own study based on the results of the CATI and CAWI survey on a sample of n = 1,233 employers.

The main factors attracting human capital to Warsaw capital region are:

1. Level of communication with important centers (COMMUN).
2. The level of earnings (WAGE).
3. Accessibility of utility infrastructure (UTIL).

Relatively high power of attraction is related to the accessibility of cultural institutions (CULTUR), the number of jobs (JOB) and the availability of educational institutions (EDU). The only factor for Warsaw capital region, which had more indications as crowding than attractive, was the cost of living. It is worth emphasizing here that the extremely significant importance of the cost of living as a determinant of human capital migration was previously noted by, among others, N.B. Simpson (2017), G. Fields & Y. Song (2020) and C.H. Mulder et al. (2020).

For Mazowieckie region, a higher percentage of responses indicating that a given factor attracts human capital occurs, in comparison with Warsaw capital region, only in the case of the cost of living (COST). The main factors attracting human capital to this region are:

1. Accessibility of utility infrastructure (UTIL).
2. Cost of living (COST).
3. Level of communication with important centers (COMMUN).

Particularly noteworthy in this context is the third factor, considered by the respondents as attractive. It should be emphasized that the level of communication of the Mazowieckie region with important centers was repeatedly raised in the public debate in the context of the phenomenon of communication exclusion of some areas of the region. It seems that the recognition of this factor as attractive is influenced by the structure of the research sample, which was included only by employers. Results could differ if other categories of respondents were also included in the sample.

The following are the factors that differed the most between regions:

1. Accessibility of cultural institutions (CULTUR).
2. Level of communication with important centers (COMMUN).
3. The level of earnings (WAGE).
4. Availability and level of healthcare (HEALTH).

The obtained results seem to confirm to a large extent a long-standing conviction about the strongest factors attracting and pushing human capital out of particular geographic areas. Invariably, one of the key determinants of migration remains the condition of the labour market and related level of wages. The importance of these factors was emphasized in the studies conducted by D.S. Kline (2003), G.S. Kainth (2009), F. Djafar (2012), V.P. Rosas & A.L. Gay (2015), or D. Hare (1999). All mentioned authors drew attention to the fact that a large number of jobs in economically strong urban centres and the size of labor demand on their local labour markets is a factor attracting labour resources from rural areas, which may result in labor shortages appearing there.

Moreover, our results confirm the significant importance of the level of local infrastructure and transportation network between important economic centres as one of the important determinants of the movement of human resources between regions. The importance of this factor was emphasized by, among others, K.K. Thet (2014), who also recognized the importance of the environmental and recreational values of a given area, claiming that dissatisfaction with the state of the natural environment in close vicinity is one of the key factors prompting emigration.

Relatively large disproportion in the assessment of the availability and level of healthcare, which was recorded in two studied regions, was previously diagnosed in scientific studies concerned with the so-called patient migration (see Cantarero, 2002; Levaggi & Zanola, 2004).

Conclusions

The issue of determinants of redistribution, concentration and dispersion of human capital has been a popular research topic undertaken by representatives of social sciences for years. It is worth noting here that one of the basic factors determining the concentration of the discussed resources, as well as their dispersion, are the processes of population migration, which are a derivative of, *inter alia*, the diversification of the attractiveness of individual areas.

This paper deals with the issue of the level of human capital as one of the key determinants of the socio-economic development of Mazovia. The results of the author's empirical research were presented and discussed, the main aim of which was to diagnose the factors pushing out of and attracting human resources to individual regions of the Masovian Voivodship. Among the most important conclusions from the research carried out, it is worth pointing to the following:

1. Business owners in the Masovian Voivodship more often indicate the attracting role of various factors. Only the “cost of living” (COST) factor has been described as pushing human capital out of the Warsaw capital region.
2. Cost of living is a factor pushing away from the Warsaw capital region and at the same time pulling to the Mazowieckie region;
3. The level of communication with important centers, the level of earnings and the accessibility of utility infrastructure are the strongest factors attracting human capital to the Warsaw capital region;
4. According to the respondents, the Mazowieckie region is mostly attractive due to the accessibility of utility infrastructure, the cost of living and the level of communication with important centers. Especially the third of the above-mentioned factors seems to be in contradiction with the thesis, popular in the public debate, about the exclusion of peripheral areas of the Masovian Voivodship in terms of transport;
5. The accessibility of utility infrastructure is a strong point of the two regions included in the study;
6. Among the factors whose assessment varied the most between the regions, the following should be indicated: the accessibility of cultural institutions, the level of communication with important centers, the level of earnings and the availability of healthcare.

It seems that the differentiation of the attractiveness of the neighbouring regions is something natural, especially when one of them houses the largest and economically strongest agglomeration centre of a given country. The natural consequence is the high power of factors attracting human capital to it and the relatively high cost of living for its inhabitants. It is worth emphasizing here, that one of the key tasks facing by the state and local authorities is to ensure the sustainable development of peripheral regions. In light of the presented research results, the main areas of government intervention should include communication and transport infrastructure as well as primary healthcare facilities.

The research results presented in this article are based on the analysis of the opinions expressed by the employers. Undoubtedly, their comparison with the opinions expressed by other groups of potential respondents: e.g. employed people, unemployed people, professionally inactive, or representatives of various age categories would be of great cognitive value. The obtained research results are an inspiration to expand further research initiatives aimed at diagnosing the factors that attract and push out of particular regions.

References

- Aghion, P., Boustan, L., Hoxby, C. & Vandenbussche J. (2009). *The causal impact of education on economic growth: evidence from U.S.* Harvard University.
- Akcoraoglu A. (2010). Employment, economic growth and labor market performance: the case of Turkey. *Ekonomik Yaklaşım*, 21(77), 101-114.
- Alhawaish, A. K. (2014). Healthcare spending and economic growth in Saudi Arabia: a Granger causality approach, *International Journal of Scientific & Engineering Research*, 5(1), 1471-1476.
- Amri, K. (2018). The macroeconomic impact of regional minimum wages: a cross-provinces data evidence from Indonesia. *Regional Science Inquiry*, 10(3), 163-176.
- Angelini, F., & Castellani, M. (2019). Cultural and economic value: a critical review. *Journal of Cultural Economics*, 43(2), 173-188. <https://doi.org/10.1007/s10824-018-9334-4>
- Bakhshi, H., Fujiwara, D., Lawton, R., Mourato, S., & Dolan, P. (2015). *Measuring economic value in cultural institutions*. Arts and humanities research council.
- Banerjee, A., Duflo, E., & Qian, N. (2012). *On the road: Access to transportation infrastructure and economic growth in China* (No. w17897). National Bureau of Economic Research.
- Bartnik, K. (2016). Znaczenie kapitału ludzkiego i społecznego w rozwoju regionalnym na przykładzie Finlandii. *Studia Oeconomica Posnaniensia*, 4(6), 7-26. <https://doi.org/0.18559/SOEP.2016.6.1>
- Becker, G.S. (1962). Investment in human capital: a theoretical analysis. *The Journal of Political Economy*, 70(5), 9-49.
- Bedir, S. (2016). Healthcare expenditure and economic growth in developing countries. *Advances in Economics and Business*, 4(2), 76-86. <https://doi.org/10.13189/aeb.2016.040202>
- Bijak J. (2006). *Forecasting international migration: selected theories, models and methods*, Warsaw: Central European Forum for Migration Research.
- Bove, V. & Elia, L. (2017). Migration, diversity, and economic growth, *World Development*, 89, 227-239. <https://doi.org/10.1016/j.worlddev.2016.08.012>
- Cantarero, D. (2006). Health care and patients' migration across Spanish regions. *The European Journal of Health Economics*, 7(2), 114-116. <https://doi.org/10.1007/s10198-006-0341-6>
- Cutanda, A., & Paricio, J. (1994). Infrastructure and regional economic growth: The Spanish case. *Regional Studies*, 28(1), 69-77.
- Dańska-Borysiak, B. & Laskowska, I. (2016). Kapitał ludzki i wzrost gospodarczy w podregionach. *Wiadomości Statystyczne* (Human capital and economic growth in subregions. *Statistical News*), 6, 31-44.
- Diebolt C. & Hippe R. (2019). The long-run impact of human capital on innovation and economic development in the regions of Europe. *Applied Economics*, 51(5), 542-563. <https://doi.org/10.1080/00036846.2018.1495820>
- Djafar, F. (2012). Dynamics of push and pull factors of migrant workers in developing countries: The case of Indonesian workers in Malaysia. *Journal of Economics and Behavioral Studies*, 4(12), 703-711.
- Doeringer P.B., & Piore M.J. (1971). *Internal labor markets and manpower analysis*, Lexington: D.C. Heath Company.
- Donou-Adonsou, F. (2019). Technology, education, and economic growth in Sub-Saharan Africa, *Telecommunications Policy*, 43(4), 353-360. <https://doi.org/10.1016/j.telpol.2018.08.005>
- Faggian, A. & McCann, P. (2009). Human capital and regional development. In R. Capello & P. Nijkamp (Eds.). *Handbook of regional growth and development theories*. Edward Elgar Publishing Limited.

- Fields, G., & Song, Y. (2020). Modeling migration barriers in a two-sector framework: A welfare analysis of the hukou reform in China. *Economic Modelling*, 84, 293-301. <https://doi.org/10.1016/j.econmod.2019.04.019>
- Florida, R. (2002). *The rise of the creative class and how it's transforming work, leisure, community and everyday life*. New York: Basic Books.
- Gennaioli, N., La Porta, R., Lopez-de-Silanes, F. & Shleifer, A. (2013). Human Capital and Regional Development. *The Quarterly Journal of Economics*, 128(1), 105-164. <https://doi.org/10.1093/qje/qjs050>
- Goldin, C. (2019). Human capital. In C. Diebolt & M. Hauptert (Eds.). *Handbook of Cliometrics*. Berlin, Heidelberg: Springer International Publishing.
- Grossman, G. M., & Krueger, A. B. (1995). Economic growth and the environment. *The quarterly journal of economics*, 110(2), 353-377.
- Hare, D. (1999). 'Push' versus 'pull' factors in migration outflows and returns: Determinants of migration status and spell duration among China's rural population. *The Journal of Development Studies*, 35(3), 45-72.
- Harris J. R. & Todaro M. P. (1970). Migration, unemployment and development: A two sector analysis. *American Economic Review*, 60(1), 126-142.
- Herbst, M. (2007). *Kapitał ludzki i kapitał społeczny a rozwój regionalny (Human and social capital and regional development)*. Warsaw: Wydawnictwo Naukowe Scholar.
- Herranz-Loncán, A. (2007). Infrastructure investment and Spanish economic growth, 1850–1935. *Explorations in Economic History*, 44(3), 452-468. <https://doi.org/10.1016/j.eeh.2006.06.002>
- Horii, R., Kitagawa, A. & Futagami K. (2008). Availability of higher education and long-term economic growth. *The Japanese Economic Review*, 59(2), 156-177. <https://doi.org/10.1111/j.1468-5876.2007.00403.x>
- Humphries, J., & Weisdorf, J. (2019). Unreal wages? Real income and economic growth in England, 1260–1850. *The Economic Journal*, 129(623), 2867-2887.
- Jerome, A. (2011). Infrastructure, economic growth and poverty reduction in Africa. *Journal of infrastructure development*, 3(2), 127-151.
- Kainth, G.S. (2009). Push and pull factors of migration: a case of brick kiln industry of Punjab State. *Asia-Pacific Journal of Social Sciences*, 1(1), 82-116.
- Khoshnevis Yazdi, S., & Khanalizadeh, B. (2017). Air pollution, economic growth and health care expenditure. *Economic research-Ekonomska istraživanja*, 30(1), 1181-1190. <https://doi.org/10.1080/1331677X.2017.1314823>
- Kijek, A., & Matras-Bolibok, A. (2020). Technological convergence across European re-gions. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 15(2), 295-313. <https://doi.org/10.24136/eq.2020.014>
- Kline, D. S. (2003). Push and pull factors in international nurse migration. *Journal of nursing scholarship*, 35(2), 107-111.
- Kuc-Czarnecka, M. (2019). Sensitivity analysis as a tool to optimise Human Development Index. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 14(3), 425–440. <https://doi.org/10.24136/eq.2019.020>
- Lee E.S. (1966). A theory of migration. *Demography*, 3(1).
- Lee, S. Y., Florida, R., & Acs, Z. J. (2004). Creativity and entrepreneurship: a regional analysis of new firm formation. *Regional Studies*, 38(8), 879–891. <https://doi.org/10.1080/0034340042000280910>
- Levaggi, R., & Zanola, R. (2004). Patients' migration across regions: the case of Italy. *Applied economics*, 36(16), 1751-1757. <https://doi.org/10.1080/0003684042000227903>
- Massey D.S., Arango J., Hugo G., Kouaouci A., Pellegrino A. & Taylor J.E. (1993). Theories of international migration: review and appraisal, *Population and Development Review*, 19(3), 349-354.

- Mulder, C. H., Lundholm, E., & Malmberg, G. (2020). Young Adults' Migration to Cities in Sweden: Do Siblings Pave the Way?. *Demography*, 57(6), 2221-2244. <https://doi.org/10.1007/s13524-020-00934-z>
- Niedzielski, P., Poznańska, K. & Matusiak, K.B. (2009). Kapitał ludzki–innowacje –przedsiębiorczość. *Zeszyty Naukowe Ekonomiczne Problemy Usług*, (Human capital – innovation – entrepreneurship. *Scientific Notebooks Economic Problems of Services*), 525, 333-342.
- Outreville, J.F. (1999). Financial development, human capital and political stability. *UNCTAD Discussion Papers 142*, United Nations Conference on Trade and Development.
- Palei, T. (2015). Assessing the impact of infrastructure on economic growth and global competitiveness. *Procedia Economics and Finance*, 23, 168-175. [https://doi.org/10.1016/S2212-5671\(15\)00322-6](https://doi.org/10.1016/S2212-5671(15)00322-6)
- Panayotou, T. (2016). Economic growth and the environment. *The environment in anthropology*, 140-148.
- Pasinetti, L.L. (1962). Rate of profit and income distribution in relation to the rate of economic growth. *Review of Economic Studies* 29(4), 267-279.
- Piore M., (1979). *Birds of passage: migrant labour and industrial societies*, Cambridge: Cambridge University Press.
- Pritchett, L. (2001). Where has all the education gone? *World Bank Economic Review*, 15, 367-391.
- Przygodzki, Z. (2019). Terytorialny wymiar kapitału ludzkiego. *Gospodarka Narodowa*, no. 4(300), 105-130. <https://doi.org/10.33119/GN/113513>
- Romer, P.M. (1989). Human capital and growth: theory and evidence. *National Bureau of Economic Research (NBER), Working Paper*, no. 3173, pp. 1-51.
- Rosas, V. P., & Gay, A. L. (2015). Push and pull factors of Latin American migration. In A. Domingo Valls, A. Sabater Coll, R. Verdugo (Eds.). *Demographic analysis of latin american immigrants in Spain*. Springer, p. 1-27. https://doi.org/10.1007/978-3-319-12361-5_1
- Schultz, T.W. (1961) Investment in human capital. *The American Economic Review*, 51(1), 1-17.
- Seyfried, W. (2005). The relationship between employment and economic growth in the ten largest states. *Southwestern Economic Review*, Spring, 13-24.
- Simionescu, M., Lazányi, K., Sopková, G., Dobeš, K. & Balcerzak A.P. (2017). Determinants of economic growth in V4 countries and Romania, *Journal of Competitiveness*, 9(1), 103-116. <https://doi.org/10.7441/joc.2017.01.07>
- Simpson, N.B. (2017). Demographic and economic determinants of migration. *IZA World of Labor*.
- Som, J., Pasal, S., & Kaboine, M. (2019). Exploring the impact of healthcare on economic growth in Africa. *Applied Economics and Finance*, 6(3), 45-57. <https://doi.org/10.11114/aef.v6i3.4110>
- Thet, K. K. (2014). Pull and push factors of migration: A case study in the urban Area of Monywa Township, Myanmar. *News from the World of Statistics*, 1(24), 1-14.
- Tian, G., & Li, J. (2019). How does infrastructure construction affect economic development along the “belt and road”: by promoting growth or improving distribution?. *Emerging markets finance and trade*, 55(14), 3332-3348. <https://doi.org/10.1080/1540496X.2019.1607725>
- Toader, E., Firtescu, B. N., Roman, A., & Anton, S. G. (2018). Impact of information and communication technology infrastructure on economic growth: An empirical assessment for the EU countries. *Sustainability*, 10(10), 3750. <https://doi.org/10.3390/su10103750>
- Tselios V., Rovolis A. & Psycharis Y. (2017). Regional economic development, human capital and transport infrastructure in Greece: the role of geography. In: M. Fonseca & U. Fratesi (Eds.). *Regional upgrading in Southern Europe. Advances in spatial science (the regional science series)*. Springer.
- Williams, A. M., Baláž, V., & Wallace, C. (2004). International labour mobility and uneven regional development in Europe: human capital, knowledge and entrepreneurship. *European Urban and Regional Studies*, 11(1), 27-46. <https://doi.org/10.1177/0969776404039140>

Wiśniewska, A., Budziński, W., & Czajkowski, M. (2020). An economic valuation of access to cultural institutions: museums, theatres, and cinemas. *Journal of Cultural Economics*, 44(4), 563-587. <https://doi.org/10.1007/s10824-020-09375-3>

Zajączkowska-Jakimiak, S. (2006) Wiedza techniczna i kapitał ludzki w teorii wzrostu gospodarczego. *Gospodarka Narodowa* (Technical knowledge and human capital in the theory of economic growth. *National Economy*), 11-12, 47-69.

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FACTORS THAT INFLUENCE THE FORMATION OF INDONESIAN SMEs' SOCIAL ENTREPRENEURSHIP: A CASE STUDY OF WEST JAVA

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Abstract. This study aimed to identify the formation of SMEs' social entrepreneurship in rural communities. The majority of people living in rural areas have their businesses. However, their welfare level is relatively low. This study tried to examine how the efforts to form SMEs' social entrepreneurship facilitate improving community welfare. The authors employed a deductive approach. They collected data in a cross-sectional manner; quantitative data processing was done using the Structural Equation Model (SEM) for 340 respondents in Indonesia who have SMEs. The results of this study showed that the influence of such factors, as intention, digital innovation thinking, and leadership attitudes have a significant effect on social entrepreneurship. However, the risk perception did not significantly affect SMEs' social entrepreneurship because of rising operating expenses. This research contributes to existing knowledge by providing novel insights facilitating social change.

Keywords: social entrepreneurship; intention; digital innovation; leadership attitude; risk perception

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JEL Classifications: Q12, P25, O18

1. Introduction

SMEs' social entrepreneurship is the upgrade version of independent entrepreneurship. This business operates in the community, intending to explore and take advantage of opportunities to create social values for social change (Mair & Marti, 2006). Besides, it also explores global phenomena of solving social problems with innovative approaches. Developing countries need entrepreneurship to reduce unemployment (Asaju, Arome, & Anyio, 2014). Besides, entrepreneurship can create social impact, social change, and social transformation (Mair & Marti, 2006; Wakkee, van der Sijde, Vaupell, & Ghuman, 2019). The goal of forming SMEs' social entrepreneurship leads to significant social, political, and economic changes for society and generates innovations and social transformations (Alvord, Brown, & Letts, 2004).

In the history of the business world, entrepreneurship on a purely business basis considers innovation, perceptions of risk or uncertainty, leadership strength for making the right decisions, good capital and management, and service-oriented (Tauber, 2019). SMEs' social entrepreneurship is a derivative of entrepreneurship that engages in the social sector by involving the community or people according to the Social Theory, namely Social Cognitive Theory (Bandura, 1999), which identifies human behavior as an interaction of personal and behavioral factors well as the environment. Social entrepreneurship goals are to explore and take advantage of opportunities to create social value for social change (Mair & Marti, 2006) and explore global phenomena in solving social problems with innovative approaches. The general goals will impact the social environment, social change, and social transformation (Mair & Marti, 2006; Wakkee et.al., 2019). The social entrepreneurship activity itself is not merely looking for profit but also jointly growing and developing a business. It makes the right instrument for creating economic value and a means for dealing with various challenges of social problems. The essence of SMEs' social entrepreneurship lies in private sector reform supported by the concerns of the government, business people, and other organizations such as non-profits.

Studies on social entrepreneurship in the last ten years have focused on findings highlighting the impact of education and practical exposure to business that can affect a person's intention to entrepreneurship and are associated with family and ethnic factors (Basu & Virick, 2007). Another study that relates to the design of entrepreneurial programs/services has aimed to foster and assist potential entrepreneurs in opening their businesses (Wu & Wu, 2008). In 2014, Steven Ney's research results suggested two dimensions associated with social entrepreneurship: social space and social change through collaboration between entrepreneurs and communities (Ney, Beckmann, Graebnitz, & Mirkovic, 2014). Another study in 2015 shows that attention to social entrepreneurship training in education is a form of implementation to get instrument support from the government (Bikse, Rivza, & Riemere, 2015). Research on social entrepreneurship that previous researchers had already conducted was generally about Social Entrepreneurship, which predicted the relationship between intention and knowledge. The intention was predicted to be a supporting factor for entrepreneurship that expected results (Koe, Sa'ari, Majid, & Ismail, 2012). Some researched the measurement of social impact in social innovation (E. K. M. Lee, Lee, Kee, Kwan, & Ng, 2019). The rest of the research was about institutional complexity impacting social entrepreneurship opportunities (Cherrier, Goswami, & Ray, 2018).

The unpopularity of social entrepreneurship in Indonesia, specifically, in West Java, can also indicate that people's intention to develop social entrepreneurship is still low. The low intention might be caused by a desire to own a business. People feel being capable of self-employment, and want to get full benefits without sharing with others. Another reason is that there is still no leadership attitude from the majority of the local communities. Social entrepreneurship demands a leader as a decision-maker to support the process of entrepreneurial activities. The leader must be competent so that they can manage personnel or employees and have good decision-making skills (Eduardo & Gabriel, 2017). Reliable leaders understand social change: leaders who collect and process information and transfer them to people who understand social change (Mack, Khare, Krämer, & Burgartz, 2015). Other than that, risk perception includes what the local community conceives about opening and developing social enterprises. The risk is a factor that the community must consider.

Furthermore, the specific objectives of this study were to find out how the intention, digital innovation thinking, leadership attitude, and participant risk perception in the formation of SMEs' social entrepreneurship function to help deal with social problems such as poverty and unemployment. Likewise, it also aims to reap sustainable benefits from social enterprises. Robinson, exploring global phenomena of solving social problems with innovative approaches (Mair & Marti, 2006) state, that social entrepreneurship will impact the social environment, will lead to social change, and social transformation (Mair & Marti, 2006; Wakkee, van der Sijde, Vaupell, & Ghuman, 2019). The empirical study of intention, digital innovation, and leadership attitudes in SMEs' social entrepreneurship is related to the Theory of Planned Behavior between intentions and perceived entrepreneurial attitudes (Ajzen, 1991; Douglas & Shepherd, 2002; Krueger & Carsrud, 1993).

2. Theoretical Background and Hypotheses

The entrepreneurial intention of a person is a variable that is considered in predicting entrepreneurial behavior, especially in the formation of SMEs' social entrepreneurship. However, researchers do not have a precise definition of individual entrepreneurial intentions. Several studies have shown that individual attitudes towards entrepreneurship appear to be related to their entrepreneurial behavior. This behavior is mediated by intention, suggesting that individual attitudes are essential factors influencing their entrepreneurial intentions (Ajzen, 1991; Hill, Fishbein, & Ajzen, 1977; Ajzen, Czasch, & Flood, 2009b). This behavior is also important in the process of entrepreneurial activities (Lee, Wong, Foo, & Leung, 2011). As with Lee's research, start-ups and previous intentions have a very significant relationship between activities carried out. The intention is predicted to be involved in entrepreneurship (Krueger, Reilly, & Carsrud, 2000); intention also predicts behavior (Hartwick, Warshaw, Edell, & Burke, 1998). The findings model is embodied in a Behavioral Planning Theory (Ajzen, 1991). Intention can also be brought closer to meaning with passion, which can support success for an entrepreneur. A person's entrepreneurial intention is crucial in achieving his hopes of becoming an entrepreneur (Shook & Bratianu, 2010). Therefore, this study considers the intention factors, which are expected to influence the formation of social entrepreneurship.

H1. The intention will have a significant positive impact on the formation of SMEs' social entrepreneurship.

Entrepreneurship innovation is crucial for maintaining the continuity of the business. Without innovation, businesses cannot compete with new, more innovative products. In this contemporary era, innovation is directly related to digitalization. Products that are packaged and offered by utilizing digitalization will undoubtedly be more attractive and spread faster considering the presence and power of social media. Innovation develops various advanced technologies by creating entrepreneurial and innovative opportunities to produce goods and services that will result in rapid scientific and technological advances in national economic activity (Raghupathi & Raghupathi, 2017). Furthermore, it means that digital-based entrepreneurship will open up business opportunities based on digital technology facilities, while other businesses are looking for business opportunities by focusing on knowledge and institutional support (Pan, Sandeep, Du, & Li, 2018). They are also aware that by mastering the digital world, they will benefit while encouraging people to advance and get help, one of which is through technology (Planing, 2017). Meanwhile, innovation thinking includes solutions to technological, economic, and business problems, organizational strength, and the social environment that can be immediately applied and used (Becker & Eube, 2018). The existence of digital entrepreneurship will gradually change traditional entrepreneurial activities, as explained by Hull in 2007 in his research. He stated that digital-based entrepreneurship is the sub-category of entrepreneurship, gradually changing traditional entrepreneurship into digital entrepreneurship. (Hull, Hung, Hair, Perotti, & Demartino, 2007). The influence of digital technology will also affect institutions and society; therefore, a strategy is needed in the competitive market economy (Baron, 1995). Proactive human resource development affects entrepreneurial business transformation (Berglund & Sandström, 2017), and knowledge can also influence digital entrepreneurship (Geissinger, Laurell, Sandström, Eriksson, & Nykvist, 2018). Digital innovation can also develop economic collaboration, namely the performance economy and platform economy, which generally means vertical disintegration. Vertical disintegration relates to connecting sellers and buyers in digital information-based forums to reduce transaction costs (Acquier, Daudigeos, & Pinkse, 2017; Mair & Reischauer, 2017). Furthermore, the researcher would consider the factors of digital innovation thinking predicted to influence social entrepreneurship formation.

H2. Digital innovation thinking will have a significant positive impact on the formation of SMEs' social entrepreneurship.

Leadership is essentially needed in the formation of SMEs-social entrepreneurship that carries out social business activities in a community environment. The activities involving many people genuinely need a leader. The leader can also be chosen from among those whom a community group has trusted. In addition, the leader can solve problems and be responsible for the running of a business. As Ruth said in her research, leaders generate ideas, motivate people, and frame narratives for a business (Rüth & Netzer, 2019). Furthermore, a leader hopes that

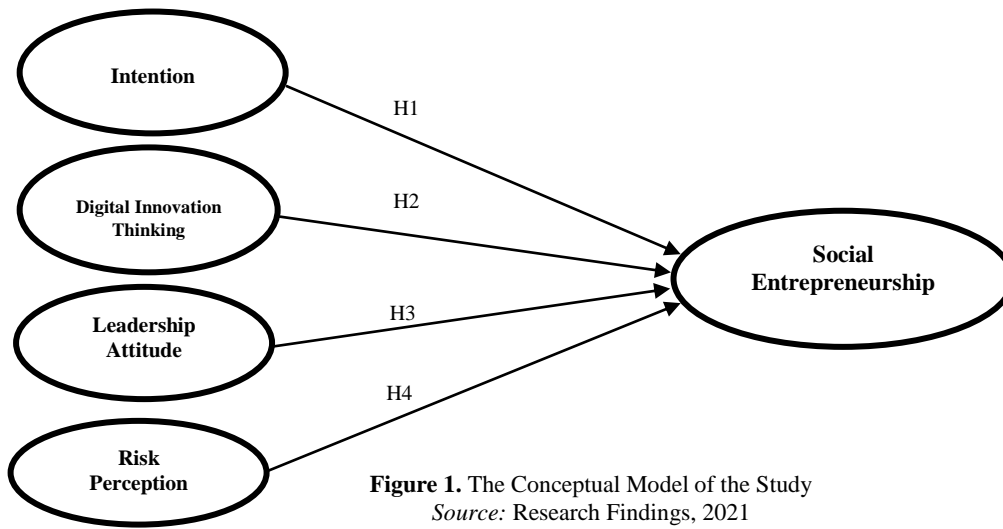
his/her sensitivity and imagination skills will have goals soon. They must be able to predict how the subsequent development of the business will be. At the same time, a reliable leader is a leader who understands social change; the leader who collects and processes information and transfers it to people who understand social change (Mack et al., 2015). Mishra also explained in his research that entrepreneurship is associated with leadership so that people can be creative, innovative, and organized (Mishra & Misra, 2017). Besides, entrepreneurial leadership also requires skills that can provide examples of acts of courage, skills to interact with one another, provide experiential methods and reflective forms that inspire a business (Mishra & Misra, 2017). Last, regarding the leadership attitude that might become a solution creator of a problem, is the attitude of a leader who dares to take risks and can control his/her internal emotions to resolve conflicts, either internal or external (Antoncic et al., 2018). There have not been many researchers who have conducted research on leadership that contributes and is uniquely relevant to entrepreneurship because social entrepreneurship is a relatively new field of study, slightly different from research on entrepreneurship in general (Weerawardena & Sullivan Mort, 2006). Social entrepreneurship is a different business model, so there is a need for leadership that will balance humanistic values and economic-motivated activities. Given the importance of leadership in SMEs-social entrepreneurship, it is possible to contextually identify the drivers that support a balance of social impact and profitability. A person's leadership attitude will encourage humanitarian behavior, which is a driving force in social entrepreneurship activities (Miller, Grimes, McMullen, & Vogus, 2012). Based on this realization, the researcher would identify the possibility of leadership attitudes predicted to affect the formation of social entrepreneurship.

H3: Leadership attitude will have a significant positive impact on the formation of SMEs' social entrepreneurship.

Entrepreneurs always think about risks, and social entrepreneurs do likewise. In theory, it is also stated that an entrepreneur has and considers a more significant risk factor than any other job (Brockhaus Sr., 1980). Hence, it can be said that in carrying out a business activity plan, an entrepreneur always consciously thought of risky actions. The importance of taking risks should be considered in social entrepreneurship (Germak & Robinson, 2014). Some entrepreneurs were thoughtless about risk, in the beginning, so they immediately started their business without thinking about risk. Some argue that individuals who want to start a business think that understanding entrepreneurial work has less risk than non-entrepreneurs (Palich & Bagby, 1995). Jilinskaya-Pandey & Wade revealed in their research that risk-taking is one of the dimensions of the Social Entrepreneur Quotient (SEQ) psychometric scale (Jilinskaya-Pandey & Wade, 2019). Future research is expected to analyze additional factors or variables that are directly or indirectly have possibilities in predicting the formation of SMEs- social entrepreneurship through consideration of risk for business. Other risk perception factors that may be considered include changes in someone's employment status (Amit, Muller, & Cockburn, 1995), the early stages of starting a business (Dubini, 1989), and other accesses on how to start a new business (Chrisman, Hoy, & Robinson, 1987). Furthermore, this study took predictions according to the initial phenomenon to understand the relationship between risk perception or risk considerations and the formation of SMEs- social entrepreneurship; therefore, the authors convinced the stages of analysis and development of the issue. Apart from risk perception, another study that other researchers had been carried out is a social risk (Amit, Muller, & Cockburn, 1995; Birley & Westhead, 1994).

H4: Risk perception will have a significant positive impact on the formation of SMEs' social entrepreneurship.

The novelty of this research is that it is the first time a study focuses on researching SMEs-social entrepreneurship. Besides, it is the first time the concept of SMEs-social entrepreneurship conceptualized to link the factors of intention, digital innovation thinking, leadership attitude, and risk perception in forming the SMEs - social entrepreneurship. All of this is obtained after reviewing the related literature. It has been identified that the previously mentioned factors are the best predictors of the formation of SMEs' social entrepreneurship. After that, the researchers proposed a hypothesis, which is outlined in Figure 1.



3. Research Methods

3.1 Respondents and survey tools

Research on the formation of SMEs' social entrepreneurship is based on a deductive approach by involving 340 SMEs entrepreneurs in West Java, Indonesia. Their average ages ranged from 18 to 65 years. The survey tool employed the distribution of questionnaires prepared in advance with the design of the research instrument. It was expected that these social tools could be accepted simply and can be understood by small businesses in the community (Anderson, 1983). Moreover, the questionnaire was constructed from the literature analysis considering the variables abovementioned.

3.2 Sampling procedure and sample size

Data was obtained from communication activities with community small businesses. The sampling technique was carried out randomly on the same occasion in order not to cause sample bias. The questionnaire was distributed manually by visiting the potential respondents face to face at a set time and place. Furthermore, from the analysis results of the questionnaire, the researchers guaranteed that the data was confidential, accurate, and anonymous. The data was recorded accurately since after the respondents filling out the questionnaire, the data went directly to the researcher. Initially, there were 32 points of statements distributed to some of the community's small businesses. In the end, 27 valid statement items were obtained, which were then used to form a questionnaire (See the appendix for questionnaire details). The questionnaire was then distributed to all respondents, totaling 340 small community businesses.

3.3 Measurements

The measurement used in this study was a Likert scale measurement with 5 points, ranging from '1' (strongly disagree) to '5' (strongly agree), with the following details: intention consists of 6 items, Digital Innovation Thinking consists of 6 items, Leadership Attitude consists of 6 items, Risk Perception consists of 5 items, and Social Entrepreneurship consists of 5 items (See the appendix for details).

3.4 Data Analysis Techniques

This study employed a cross-sectional data collection technique. The type of tool used was a survey list distributed to analyze the answers of 340 respondents from 6 villages in West Java, Indonesia. Structural Equation Modeling (SEM) was used for data analysis purpose.

4. Results and Discussions

4.1 Respondents' Demography

The respondents' demographic profile has a valuable function for understanding social and economic problems and can identify several solutions (Nwankwo & Gbadamosi, 2013). Based on the data obtained, the total respondents who have SMEs (Small and Medium-sized enterprises) were 340, consisting of 184 male respondents (54%) and 156 female respondents (46%). The age of the respondents was described as follows: 44 of respondents aged 18 to 30 years (13%) and 90 of respondents aged between 31 to 40 years (26%), 119 respondents aged 41 to 50 years (35%), and respondents aged 51 to 65 years were 87 (26%). Concerning the length of time they have opened their business, it ranged from 1 year to 10 years with 96 respondents (28%), 11 years to 20 years with 146 respondents (43%), over 20 years with 98 respondents (29%). The data can be seen in Table 1.

Table 1. Respondents' demography

Classification	Category	Frequency	Percentage
Gender	Male	184	54
	Female	156	46
	Total	340	100
Age	18 – 30	44	13
	31 – 40	90	26
	41 – 50	119	35
	51 – 65	87	26
	Total	340	100
Year to business	1-10 year	96	28
	11-20 years	146	43
	More than 20 years	98	29
	Total	340	100

Source: Research Findings, 2020

4.2 Descriptive statistics, reliability assessment, and Pearson's correlation

The observation of respondent participation applied descriptive statistics. The highest average value for the variable intention is 1.657, and leadership attitude is 1.644. At the same time, the medium one is the variable for digital innovation thinking with 1.245, and then the lowest was risk perception with 866. Apart from that, an average score was obtained for the social entrepreneurship variable with 1.735. At the same time, the criteria for the classification of research variables are displayed in Table 2.

Likewise, the highest value for deviation standard is in variable risk perception (1.947), while the lowest is for social entrepreneurship (1.116). Values of 1.157, 1.111, and 1.163 were observed for the variables intention, digital innovation thinking, and leadership attitude, respectively. While the highest consistency is in the social entrepreneurship variable (0.857), compared to other variables (intention = 0.817, digital innovation thinking = 0.707, leadership attitude = 0.835 and risk perception = 0.573). Finally, the value of Pearson correlations ranges between 0.100 and 0.477 (Table 3).

Table 2. Criteria of Research Variable Classification

No	Variable	Classification Range				
		Very Low 412-658	Low 659-905	Enough 906-1152	High 1153-1399	Very High 1400-1647
1.	Intention	-	-	-	-	1.657
2.	Digital Inv.Thinking	-	-	-	-	1.245
3.	Leadership Attitude	-	-	-	-	1.644
4.	Risk-Taking	-	866	-	-	-
5.	Social Entrepreneurship	-				1.735

Source: Research Findings, 2021

Table 3. Descriptive Statistics, Reliability, and Correlation

No.	Variable	Mean	Standard Deviation	Alpha (α)	1	2	3	4
1.	Social Entrepreneurship	1.735	1.116	0.857	***			
2.	Intention	1.657	1.157	0.817	0.402**	***		
3.	Digital Innovation Thinking	1.245	1.131	0.707	0.279**	0.477**	***	
4.	Leadership Attitude	1.644	1.163	0.835	0.377**	0.457**	***	
5.	Risk Perception	866	1.957	0.573	0.100*	0.213**	0.320**	***

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

Source: Research Findings, 2021

4.3 The Fitness Model and Hypothesis Testing

Researchers used the model suitability statistics (absolute and incremental indices) to determine the strength of the test from the count statistical. Regarding the Absolute Conformity Index, the chi-square value highlighted the insignificant value of χ^2 / CMIN (2.855; $p > 0.005$), which confirmed the positive sign of model fit with the data. Meanwhile, the goodness of fit index (GFI) is indexed 0.951, and the conformity index (AGFI) is in a good category with 0.927, and the root mean square error of the approximation (RMSEA) is 0.047. The following are the index values: incremental fit (NFI) with 0.937 and comparative suitability index (CFI) with 0.945. Both of them were found to be acceptable. This score satisfies the absolute model requirements (Cheung & Chan, 2009; Yvette Reisinger & Mavondo, 2008) (Table 4).

Table 4. Goodness-of-Fit Statistics

Model Fit Indicators	CMIN/df	GFI	AGFI	NFI	CFI	RMSEA
	2.855	0.951	0.927	0.937	0.945	0.047
Suggested values	< 3	> 0.90	> 0.90	> 0.90	> 0.90	< 0.05

Abbreviations: CMIN = χ^2 / df ; df =, degree of freedom; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; NFI = Normed-Fit Index; CFI = Comparative-Fit Index; RMSEA = Root Mean Square Error of Approximation

Source: Research Findings, 2021

To explain the relationship between several variables, Structural Equation Modeling (SEM) was used. The use of the technique allows researchers to reveal the relationship of several dependent and independent variables instantly (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Processing the proposed relationship data was based on standard error (SE), critical ratio (CR), and significance level (at $p = < 0.01$). These results indicate a significant positive relationship between the intention variable and the formation of SMEs-social entrepreneurship (SE = 0.067; CR = 6,677; $p = < 0.01$). Therefore, H1 is supported. Likewise, the SEM weight for H2 (SE = 0.077; CR = 6.415; $p = < 0.01$) stated a positive and significant relationship between digital innovation thinking and social entrepreneurship. Hence, H2 is accepted. Furthermore, for H3, it shows SE = 0.086; CR = 6,515; $p = < 0.01$,

then H3 is accepted, indicating a significant positive relationship between the leadership attitude variable and social entrepreneurship. Finally, the proposed association between risk perception and social entrepreneurship (H4) was not accepted since $SE = 0.023$; $CR = 0.474$; $p = <0.01$ (Table 5 and Figure 2). In short, H1, H2, and H3 were accepted, while H4 was not accepted or rejected.

Table 5. Hypotheses Testing Weights

N0.	Independent variable	Dependent variables	Estimate	SE	CR	p	Decision
1.	Intention	Social Entrepreneurship	0.677	0.067	6.677	***	Accepted
2.	Digital Innovation Thinking	Social Entrepreneurship	0.698	0.077	6.415	***	Accepted
3.	Leadership Attitude	Social Entrepreneurship	0.711	0.086	6.515	***	Accepted
4.	Risk Perception	Social Entrepreneurship	0.053	0.023	0.474	***	Not Accepted

Abbreviations: CR, critical ratio; p, significance level; Note: SE= standard error; CR=critical ratio; p=significance level= ***p<0.01.

Source: Research Findings, 2021

This study has proposed four hypotheses taken from the conceptual model description: the effect of intention, digital innovation thinking, leadership attitude, and risk perception on social entrepreneurship. The data processing results show that there is an effect of intention on the formation of SMEs-social entrepreneurship, which is positive and significant. Hence, H1 is accepted. It can be predicted from the results of the analysis of respondents that the intention of the community to own and develop a social business can be said to be enormous. Furthermore, with their intention, they also think that the results will be greater than the efforts done individually since they share the workload and funding if the efforts are carried out together. Different thoughts can be constructive so that social enterprises may develop rapidly. The attitudes and thoughts of these individuals are essential factors that influence their intention in entrepreneurship (Ajzen, 1991). The statement, as mentioned earlier, is also supported by Krueger, who states that intention will affect entrepreneurial activities (Krueger, et al, 2000). Thus, it is not difficult for people who already have small businesses to grow their intention to expand their business to become entrepreneurs (Shook & Bratianu, 2010). They do not forget to think about the most important goal of social business activity, which will impact the social environment, social change, and social transformation (Mair & Marti, 2006; Wakkee, et. all, 2019). The influence of digital innovation thinking on social entrepreneurship shows a positive and significant effect; therefore, H2 is accepted. The significant effect is supported by research conducted by Raghupathi, which states the idea of mastery of innovation can develop entrepreneurial, and scientific and technological advances are obtained from the creation of goods and services that will increase creative and productive economic activities (Raghupathi & Raghupathi, 2017).

Pan confirms the abovementioned statement in his research, digital-based entrepreneurship opens up opportunities based on the use of digital technology (Pan et al., 2018). There is still a possibility of digital technology being applied for social business activities. Responding to digital innovation thinking, people need knowledge or guidance on using social media as a means of communication to expedite their business activities. In general, it can be defined that virtual communication involves people (members), interaction, cyberspace, and the achievement of common goals (Koh & Kim, 2004 & Liu & Li, 2012). However, they believe that communication can still be done online and offline daily. From a social perspective, research studies on digital innovation thinking are also directed at using social media in terms of interaction for social business activities and the creation of social values (Henri & Pudelko, 2003).

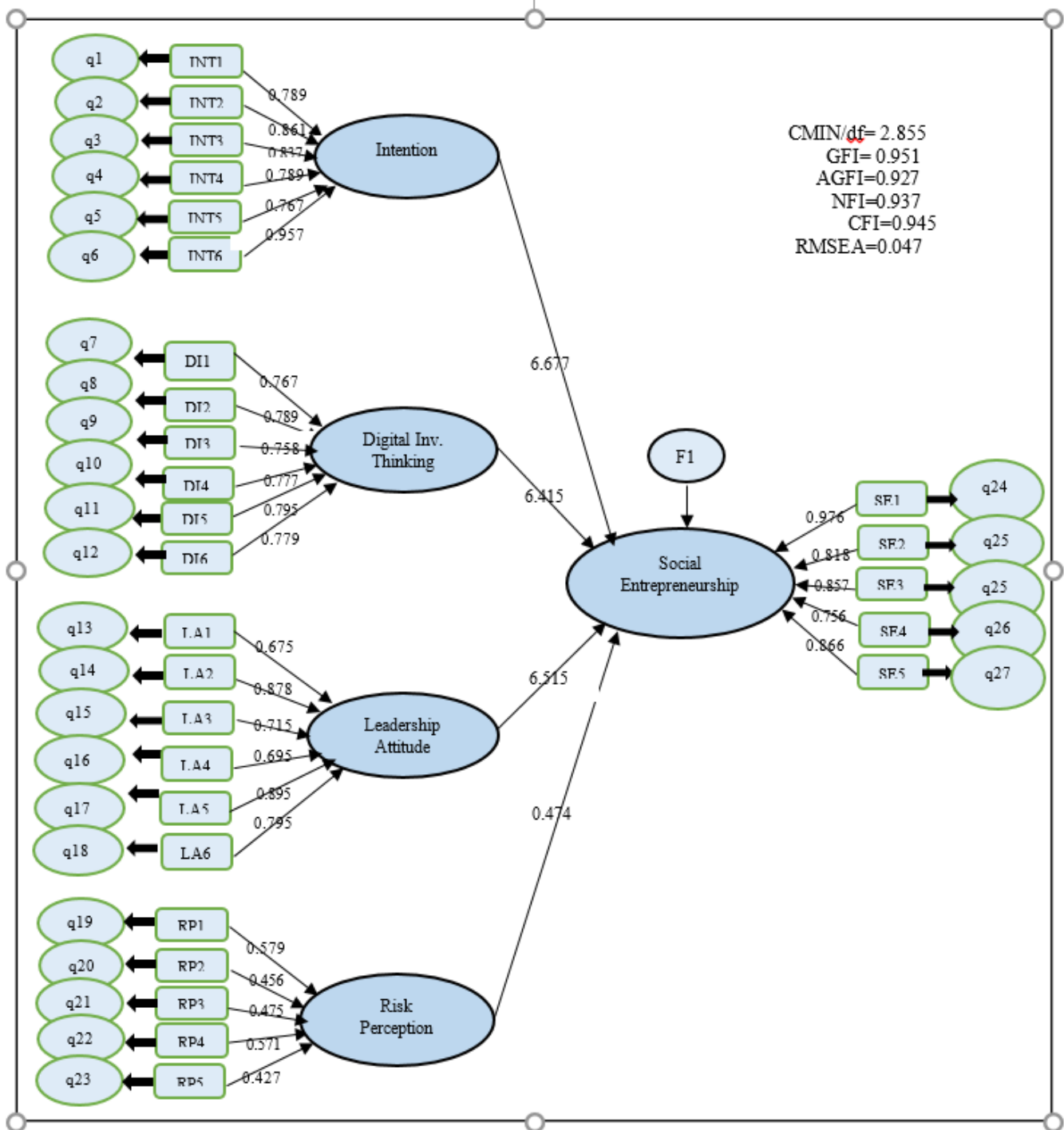


Figure 2. Structural Equation Model

Source: Research Findings, 2021

As for H3, there is also a positive and significant influence between leadership attitudes towards social entrepreneurship; hence, H3 is accepted. The results of this analysis suggest that society needs a leader who can lead social enterprises responsibly and has excellent and innovative leadership characteristics (Agarwal,

Campbell, Franco, & Ganco, 2016). However, social entrepreneurship in Indonesia has not been widely evolved in urban and rural areas because most people tend to be self-employed and have not thought about joining together to form social entrepreneurship. However, there is still a possibility in the future for them to form social entrepreneurship. The community also takes into consideration who would lead them later and whom they can trust. Furthermore, they still agree that a leader is truly responsible and has good leadership character for their joint efforts. As said by Ruth in her research, leaders are people who can come up with ideas, motivate people, and frame narratives for a business (Rüth & Netzer, 2019). At the same time, the community hopes that a leader can mobilize and set an example for them to be creative, innovative, and organized (Mishra & Misra, 2017). Besides, the leaders are also willing to collect and able to provide examples of acts of courage, skills to interact with one another, provide experiential methods, and reflective forms that inspire a business (Mack, Khare, Krämer, & Burgartz, 2015; Mishra & Misra, 2017).

The effect of risk perception on the formation of SMEs-social entrepreneurship is stated to have no positive and significant effect; hence, H4 is rejected. It is because people do not feel too burdened by thoughts of risk. They think that social enterprise will ease their work, especially in terms of funding. Therefore, they do not consider risk perception. In other words, they ignore it because it will hinder social business activities. Furthermore, based on empirical research, it can be claimed that the risk tendency is not related to the formation of a business (Busenitz & Barney, 1997). Therefore, social entrepreneurship does not always indicate risk perception. Another finding reveals that not all entrepreneurs always think of a higher risk to start a business. However, other research states that entrepreneurs have a greater risk tendency than others (Brockhaus Sr., 1980). This statement was also denied by Palich & Bagby, who stated that entrepreneurial work had less risk than non-entrepreneurs (Palich & Bagby, 1995). This objection was reinforced by Jilinskaya-Pandey & Wade, who said social entrepreneurs might need to be prepared to accept a higher level of risk than their colleagues (Jilinskaya-Pandey & Wade, 2019). From the results of this study, it is emphasized once again that the effect of risk perception on social entrepreneurship does not have a positive and significant effect.

Another thing that has been revealed from this study's results is the community's desire to sustain a competitive advantage. This revelation is very reasonable for them to convey because they have high hopes for this social entrepreneurship activity which involves innovative actions. Thus, it is hoped that their needs will meet the result of the social problems that are being handled. Meanwhile, other research revealed that the desired outcome of a social enterprise activity that involves innovation is an increase in human welfare and the environment, with apparent changes in both the quality and quantity of life. In other words, social entrepreneurship has goals of social change, welfare, and reducing unemployment. The main objective of social entrepreneurship research is the social impact (Austin, Stevenson, & Wei-Skillern, 2006). The role of social impact on social entrepreneurship is very positive (Ormiston & Seymour, 2011). Therefore, social entrepreneurship must also prioritize profit besides focusing on social goals (Nicolás, Rubio, & Fernández-Laviada, 2018). The community will keep actively struggling for the sustainability of the social enterprise with a competitive advantage. Hence, a leader is also needed in financial affairs, who can read future profits and manage them properly, honestly, and responsibly.

5. Contributions

Supporting factors of social entrepreneurship for small and medium enterprises in rural areas include intention, digital innovation thinking, and leadership attitude. These are the things that need to be implemented in the community to create a social enterprise that will bring social change. Furthermore, this research aimed to provide awareness to rural communities to carry out economic activities based on togetherness and digital to create and innovate following the trends and era. By implementing these efforts, the community can compete in the national and even international economy scale. Besides, the results of this research can also be a means for learning among other communities worldwide. It is also expected that the result of this research can be a source of inspiration and

emotional consistency for small and medium-sized entrepreneurs, even prominent entrepreneurs in developing social entrepreneurship, which in turn will improve the national economy.

6. Conclusions

On the one hand, this study found a positive and significant impact on intention, digital innovation thinking, and leadership attitude towards forming social entrepreneurship in rural areas in Indonesia. On the other hand, risk perception was not proven to be positively significant in predicting social entrepreneurship. People felt that the work and capital burden on the business could be considered and handled together; therefore, risk perception is not needed. Moreover, people were more concerned with the development of SMEs-social entrepreneurship, which would result in a social change, one of which is increasing welfare rather than thinking about the risks that will be faced.

References

- Acquier, A., Daudigeos, T., & Pinkse, J. (2017). Promises and paradoxes of the sharing economy: An organizing framework. *Technological Forecasting and Social Change*, 125(July), 1–10. <https://doi.org/10.1016/j.techfore.2017.07.006>
- Agarwal, R., Campbell, B. A., Franco, A. M., & Ganco, M. (2016). What do i take with me? the mediating effect of spin-out team size and tenure on the founder-firm performance relationship. *Academy of Management Journal*, 59(3), 1060–1087. <https://doi.org/10.5465/amj.2012.0853>
- Ajzen. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes* 50, 179-211. Retrieved from [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I., Czasch, C., & Flood, M. G. (2009b). From intentions to behavior: Implementation intention, commitment, and conscientiousness. *Journal of Applied Social Psychology*, 39(6), 1356–1372. <https://doi.org/10.1111/j.1559-1816.2009.00485.x>
- Alvord, S. H., Brown, L. D., & Letts, C. W. (2004). Social Entrepreneurship: An Exploratory Study. *The Journal of Applied Behavioral Science*, 40(3). <https://doi.org/10.1177/0021886304266847>
- Amit, R., Muller, E., & Cockburn, I. (1995). Opportunity costs and entrepreneurial activity. *Journal of Business Venturing*, 10(2), 95–106. [https://doi.org/10.1016/0883-9026\(94\)00017-O](https://doi.org/10.1016/0883-9026(94)00017-O)
- Anderson, B. (1983). Quantitative Studies in Social Relations. In *Handbook of Survey Research*. <https://doi.org/10.1016/b978-0-12-598226-9.50001-x>
- Antoncic, J. A., Antoncic, B., Gantar, M., Hisrich, R. D., Marks, L. J., Bachkirov, A. A., ... Kakkonen, M.-L. (2018). Risk-Taking Propensity and Entrepreneurship: The Role of Power Distance. *Journal of Enterprising Culture*, 26(01), 1–26. <https://doi.org/10.1142/s0218495818500012>
- Asaju, K., Arome, S., & Anyio, S. F. (2014). Rising rate of unemployment in Nigeria: the Socio-Economic and political implications The rising rate of unemployment in Nigeria: the socio-economic and political implications. *Global Business and Economics Research Journal*, 3(1), 68. Retrieved from <http://www.journal.globejournal.orghttp://www.journal.globejournal.org>
- Austin, J., Stevenson, H., & Wei-Skillern, J. (2006). Social and Commercial Entrepreneurship: Same, Different, or Both? *Entrepreneurship Theory and Practice*, 30(1), 1–22., 77–96. <https://doi.org/10.4135/9789353885892.n4>

- Bandura, A. (1999). A social cognitive theory of personality. *Handbook of Personality: Theory and Research*, 154–196. Retrieved from <https://www.google.com/books?hl=en&lr=&id=b0yalwi1HDMC&oi=fnd&pg=PA154&dq=Social+cognitive+theory+of+personality&ots=767yO2WqNj&sig=yJSrel-r7pTwEDiqNK1VhqmDfW>
- Baron, D. P. (1995). Integrated Strategy: *California Management Review*, 37(2), 47–65. Retrieved from doi:10.2307/41165788
- Basu, A., & Virick, M. (2007). Assessing Entrepreneurial Intentions Amongst Students : A Comparative Study Peer-Reviewed Papers. *Peer Reviewed Papers*, (2000), 79–86.
- Becker, B. A., & Eube, C. (2018). Open innovation concept: Integrating universities and business in digital age. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(1). <https://doi.org/10.1186/s40852-018-0091-6>
- Berglund, H., & Sandström, C. (2017). A new perspective on the innovator's dilemma-exploring the role of entrepreneurial incentives. *International Journal of Technology Management*, 75(1–4), 142–156. <https://doi.org/10.1504/IJTM.2017.085692>
- Bikse, V., Rivza, B., & Riemere, I. (2015). The Social Entrepreneur as a Promoter of Social Advancement. *Procedia - Social and Behavioral Sciences*, 185, 469–478. <https://doi.org/10.1016/j.sbspro.2015.03.405>
- Birley, S., & Westhead, P. (1994). A taxonomy of business start-up reasons and their impact on firm growth and size. *Journal of Business Venturing*, 9(1), 7–31. [https://doi.org/10.1016/0883-9026\(94\)90024-8](https://doi.org/10.1016/0883-9026(94)90024-8)
- Brockhaus Sr., R. H. (1980). Risk Taking Propensity of Entrepreneurs. *Academy of Management Journal*, 23(3), 509–520. Retrieved from 10.2307/2555150 <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=4395849&site=ehost-live>
- Busenitz, L. W., & Barney, J. B. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, 12(1), 9–30. [https://doi.org/10.1016/S0883-9026\(96\)00003-1](https://doi.org/10.1016/S0883-9026(96)00003-1)
- Cherrier, H., Goswami, P., & Ray, S. (2018). Social entrepreneurship: Creating value in the context of institutional complexity. *Journal of Business Research*, 86, 245–258. <https://doi.org/10.1016/j.jbusres.2017.10.056>
- Cheung, M. W. L., & Chan, W. (2009). A two-stage approach to synthesizing covariance matrices in meta-analytic structural equation modeling. *Structural Equation Modeling*, 16(1), 28–53. <https://doi.org/10.1080/10705510802561295>
- Chrisman, J. J., Hoy, F., & Robinson, R. B. (1987). New venture development: The costs and benefits of public sector assistance. *Journal of Business Venturing*, 2(4), 315–328. [https://doi.org/10.1016/0883-9026\(87\)90024-3](https://doi.org/10.1016/0883-9026(87)90024-3)
- Douglas, E. J., & Shepherd, D. A. (2002). Self-Employment as a Career Choice: Attitudes, Entrepreneurial Intentions, and Utility Maximization. *Entrepreneurship Theory and Practice*, 26(3), (2000), 81–90. Retrieved from doi:10.1177/104225870202600
- Dubini, P. (1989). Which venture capital backed entrepreneurs have the best chances of succeeding? *Journal of Business Venturing*, 4(2), 123–132. [https://doi.org/10.1016/0883-9026\(89\)90026-8](https://doi.org/10.1016/0883-9026(89)90026-8)
- Eduardo, J. P., & Gabriel, A. G. (2017). Assessing the Leadership Skills of the Chiefs of Police in the Towns of Nueva Ecija, Philippines: A Dichotomy between Managerial Competence and Decision Making Ability. *Open Journal of Leadership*, 06(04), 142–159. <https://doi.org/10.4236/ojl.2017.64011>
- Geissinger, A., Laurell, C., Sandström, C., Eriksson, K., & Nykvist, R. (2018). Digital entrepreneurship and field conditions for institutional change— Investigating the enabling role of cities. *Technological Forecasting and Social Change*, (November 2017), 0–1. <https://doi.org/10.1016/j.techfore.2018.06.019>
- Germak, A. J., & Robinson, J. A. (2014). Exploring the Motivation of Nascent Social Entrepreneurs. *Journal of Social Entrepreneurship*, 5(1), 5–21. <https://doi.org/10.1080/19420676.2013.820781>
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
- Hartwick, S.J., Warshaw, P.R., Edell, B.H., & Burke, Ch.M. (1998). The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research. *Journal of Consumer*, 15(December), 325–343.
- Henri, F., & Pudelko, B. (2003). Understanding and analysing activity and learning in virtual communities. *Journal of Computer Assisted*

Learning, 19(4), 474–487. <https://doi.org/10.1046/j.0266-4909.2003.00051.x>

Hill, R. J., Fishbein, M., & Ajzen, I. (1977). Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. *Contemporary Sociology*, 6(2), 244. <https://doi.org/10.2307/2065853>

Hull, C. E., Hung, Y. T. C., Hair, N., Perotti, V., & Demartino, R. (2007). Taking advantage of digital opportunities: A typology of digital entrepreneurship. *International Journal of Networking and Virtual Organisations*, 4(3), 290–303. <https://doi.org/10.1504/IJNVO.2007.015166>

Jilinskaya-Pandey, M., & Wade, J. (2019). Social Entrepreneur Quotient: An International Perspective on Social Entrepreneur Personalities. *Journal of Social Entrepreneurship*, 10(3), 265–287. <https://doi.org/10.1080/19420676.2018.1541013>

Koe, W.-L., Sa'ari, J. R., Majid, I. A., & Ismail, K. (2012). Determinants of Entrepreneurial Intention Among Millennial Generation. *Procedia - Social and Behavioral Sciences*, 40, 197–208. <https://doi.org/10.1016/j.sbspro.2012.03.181>

Koh, J., & Kim, Y. G. (2004). Knowledge sharing in virtual communities: An e-business perspective. *Expert Systems with Applications*, 26(2), 155–166. [https://doi.org/10.1016/S0957-4174\(03\)00116-7](https://doi.org/10.1016/S0957-4174(03)00116-7)

Kolvereid, L. (1997). Prediction of Employment Status Choice Intentions. *Entrepreneurship Theory and Practise*, 47–58. Retrieved from <https://doi.org/10.1177/104225879602100104>

Krueger, N. F., & Carsrud, A. L. (1993). Entrepreneurial intentions: Applying the theory of planned behaviour. *Entrepreneurship and Regional Development*, 5(4), 315–330. <https://doi.org/10.1080/08985629300000020>

Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing Models of Entrepreneurial Intentions. *Journal of Business Venturing* 15, 9026(98), 411–432. Retrieved from [https://doi.org/10.1016/S0883-9026\(98\)00033-0](https://doi.org/10.1016/S0883-9026(98)00033-0)

Lee, E. K. M., Lee, H., Kee, C. H., Kwan, C. H., & Ng, C. H. (2019). Social Impact Measurement in Incremental Social Innovation. *Journal of Social Entrepreneurship*, 0(0), 1–18. <https://doi.org/10.1080/19420676.2019.1668830>

Lee, L., Wong, P. K., Foo, M. Der, & Leung, A. (2011). Entrepreneurial intentions: The influence of organizational and individual factors. *Journal of Business Venturing*, 26(1), 124–136. <https://doi.org/10.1016/j.jbusvent.2009.04.003>

Liu, Y. C., & Li, F. C. (2012). Exploration of social capital and knowledge sharing: An empirical study on student virtual teams. *International Journal of Distance Education Technologies*, 10(2), 17–38. <https://doi.org/10.4018/jdet.2012040102>

Mack, O., Khare, A., Krämer, A., & Burgartz, T. (2015). Managing in a VUCA world. *Managing in a VUCA World*, 1–250. <https://doi.org/10.1007/978-3-319-16889-0>

Mair, J., & Marti, I. (2006). *Social entrepreneurship research: A source of explanation, prediction, and delight*. 41, 36–44. <https://doi.org/10.1016/j.jwb.2005.09.002>

Mair, J., & Reischauer, G. (2017). Capturing the dynamics of the sharing economy: Institutional research on the plural forms and practices of sharing economy organizations. *Technological Forecasting and Social Change*, 125(October), 11–20. <https://doi.org/10.1016/j.techfore.2017.05.023>

Miller, T. L., Grimes, M. G., McMullen, J. S., & Vogus, T. J. (2012). Venturing for others with heart and head: How compassion encourages social entrepreneurship. *Academy of Management Review*, 37(4), 616–640. <https://doi.org/10.5465/amr.2010.0456>

Mishra, P., & Misra, R. K. (2017). Entrepreneurial Leadership and Organizational Effectiveness: A Comparative Study of Executives and Non-executives. *Procedia Computer Science*, 122, 71–78. <https://doi.org/10.1016/j.procs.2017.11.343>

Ney, S., Beckmann, M., Graebnitz, D., & Mirkovic, R. (2014). Social entrepreneurs and social change: Tracing impacts of social entrepreneurship through ideas, structures and practices. *International Journal of Entrepreneurial Venturing*, 6(1), 51–68. <https://doi.org/10.1504/IJEV.2014.059405>

Nicolás, C., Rubio, A., & Fernández-Laviada, A. (2018). Cognitive Determinants of Social Entrepreneurship: Variations According to the Degree of Economic Development. *Journal of Social Entrepreneurship*, 9(2), 154–168. <https://doi.org/10.1080/19420676.2018.1452280>

Nwankwo, S., & Gbadamosi, A. (2013). Faith and entrepreneurship among the British African–Caribbean: Intersections between religious

- and entrepreneurial values. *Journal of Small Business and Enterprise Development*, 20(3), 618–633. <https://doi.org/10.1108/JSBED-04-2013-0066>
- Ormiston, J., & Seymour, R. (2011). Understanding Value Creation in Social Entrepreneurship: The Importance of Aligning Mission, Strategy and Impact Measurement. *Journal of Social Entrepreneurship*, 2(2), 125–150. <https://doi.org/10.1080/19420676.2011.606331>
- Palich, L. E., & Bagby, D. (1995). Using cognitive theory to explain risk taking. *Journal of Business Venturing*, 10(2), 425–438. Retrieved from doi:10.1016/0883-9026(95)00082-j
- Pan, S. L., Sandeep, M. S., Du, W., & Li, W. (2018). Digital Entrepreneurship Ecosystem as a New Form of Organizing: A Case of Zhongguancun. *Digital Enablement*, 1–25. https://doi.org/10.1142/9789813209138_0001
- Planing, P. (2017). On the origin of innovations—the opportunity vacuum as a conceptual model for the explanation of innovation. *Journal of Innovation and Entrepreneurship*, 6(1). <https://doi.org/10.1186/s13731-017-0063-2>
- Raghupathi, V., & Raghupathi, W. (2017). Innovation at country-level: association between economic development and patents. *Journal of Innovation and Entrepreneurship*, 6(1). <https://doi.org/10.1186/s13731-017-0065-0>
- Rüth, R., & Netzer, T. (2019). The key elements of cultural intelligence as a driver for digital leadership success. *Leadership, Education, Personality: An Interdisciplinary Journal*, (0123456789). <https://doi.org/10.1365/s42681-019-00005-x>
- Shook, C. L., & Bratianu, C. (2010). Entrepreneurial intent in a transitional economy: An application of the theory of planned behavior to Romanian students. *International Entrepreneurship and Management Journal*, 6(3), 231–247. <https://doi.org/10.1007/s11365-008-0091-2>
- Tauber, L. (2019). Beyond Homogeneity: Redefining Social Entrepreneurship in Authoritarian Contexts. *Journal of Social Entrepreneurship*, 12(1), 50–68. <https://doi.org/10.1080/19420676.2019.1668829>
- Wakkee, I., van der Sijde, P., Vaupell, C., & Ghuman, K. (2019). The university's role in sustainable development: Activating entrepreneurial scholars as agents of change. *Technological Forecasting and Social Change*, 141(October), 195–205. <https://doi.org/10.1016/j.techfore.2018.10.013>
- Weerawardena, J., & Sullivan Mort, G. (2006). Investigating social entrepreneurship: A multidimensional model. *Journal of World Business*, 41(1), 21–35. <https://doi.org/10.1016/j.jwb.2005.09.001>
- Wu, S., & Wu, L. (2008). The impact of higher education on entrepreneurial intentions of university students in China. *Journal of Small Business and Enterprise Development*, 15(4), 752–774. <https://doi.org/10.1108/14626000810917843>
- Yvette Reisinger, & Mavondo, F. (2008). Structural Equation Modeling: Critical Issues and New Developments. *Journal of Travel & Tourism Marketing*, (July 2013), 37–41. <https://doi.org/10.1300/J073v21n04>

APPENDIX

Survey Tools

No.	Variabels	Indicators	Likert Scale
1.	Intention	I am interested in social entrepreneurship	VDIn, Nin,DB, In, VIn
		I am interested and like working with other people	
		I am interested in developing social entrepreneurship because the results will also be greater than my own efforts	
		I am interested in social entrepreneurship because the burden of mind and work can be borne together	
		I am interested in social entrepreneurship because capital can be shared	
		I am interested in social entrepreneurship because it can create social change, social impact, and social transformation	
2.	Digital Innovation Thinking	I intend to learn about the digital media	SDA, DA, DB, A, SA
		With digital innovation thinking, social entrepreneurship can develop	
		With digital innovation thinking, it encourages the creation of digital goods and services as well	
		With digital innovation thinking, it can help the online marketing process	
		With digital innovation thinking, it can help the communication process which will save time and effort	
		There is a need for training on the use of digital innovation and I will follow that	
3.	Leadership Attitude	A leader must think rationally, that is, decide something based on logical and reasonable thoughts and considerations.	SDA, DA, DB, A, SA
		A leader must be able to determine the priority scale in deciding everything in social entrepreneurship activities	
		A leader must have the courage to become a leader and be able to overcome business conflicts that occur in the community	
		A leader must be able to strive to make short-term and long-term plans in social entrepreneurship.	
		A leader must be able to collect and process information for a social change	
		A leader must be able to be creative and innovative. In developing social entrepreneurship	
4.	Risk Taking	I thought more about profit than risk	SDA, DA, DB, A, SA
		The risk of social entrepreneurship is relatively smaller than an independent business	
		I don't really think about the risks of this social enterprise because it is shared	
		In my opinion, business risks can be handled together	
		Striving for risk management as much as possible	
5.	Social Entrepreneur-ship	Social entrepreneurship aims to create social change	SDA, DA, DB, A, SA
		Social entrepreneurship can improve community welfare	
		Social entrepreneurship can help transform traditional businesses into modern businesses	
		With this social effort, it is hoped that the unemployment rate will decrease	
		With this social effort, it is hoped that there will be economic development in our area	

VDIn= Very Disinterested, Nin= Not Interested, DB= Doubtful, In= Interested, VIn= Very interested

SDA= Strongly Disagree, DA= Disagree, DB= Doubtful, A= Agree, SA= Strongly Agree

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ACCOUNTING ASPECTS OF REVENUES IN DOUBLE ENTRY ACCOUNTING OF SLOVAKIA AND COMPARISON WITH INTERNATIONAL ACCOUNTING STANDARDS*

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Abstract. Revenue is the basic information needed to calculate the profit or loss of an entity that accounts in the underlying accounting system. The aim of the presented article is to point out the definition of revenues according to international accounting standards and their comparison with revenues in the Slovak Republic. The article is based on the requirements of the European Union and takes into account 2 assumptions: the accrual basis and the revenues according to IAS (for business entities) and IPSAS (for public administration entities). We used the method of comparison and the method of analysis. The article also contains the results of the control activities of the Financial Administration of the Slovak Republic, as revenues are the basic attribute for calculating the corporate income tax base. This is the initial phase of general analysis, in which we will continue with more detailed intentions in other published articles.

Keywords: revenues according to the legislation of the Slovak Republic; revenues according to IAS and IPSAS; register of financial statements, auditors of the Financial Administration of the Slovak Republic

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1. Introduction

The concept of revenue is a basic concept in double-entry bookkeeping. (Drury, 2017). It is an important concept because, when comparing revenue from costs, entities quantify the profit or loss in a double-entry bookkeeping system.

Due to the correct quantification of the economic result, accounting units in the Slovak Republic are obliged to apply the accrual principle, which means that they account for income and expenses in the period to which they are temporally and materially related. This obligation has been introduced into accounting procedures through accounts that are in the account group 38 - Accruals also affect the application of costs in accounting units. The basic idea of the definition of income is stated in the international accounting standards, from which they were implemented into the legislation of the Slovak Republic. The definition of revenues is uniform for public administration entities as well as for business entities, but the division of revenues is different. Revenues also have an impact on the correct determination of the corporate income tax base, therefore this article also contains the results of the control activities of the Financial Administration of the Slovak Republic.

2. Literature review

Revenues represent an economic increase in the value of assets and are also a basic element in calculating the entity's profit or loss. This viewpoint is also defined in international accounting standards as well as in the valid legislation in Slovakia. The methodology of revenue recognition is similar in the accounting of entrepreneurial accounting units as well as public administration entities. The difference is that public administration entities have a different method of financing than business units and therefore have other accounts included in the chart of accounts. Following authors are focused on these issues: Farkaš, 2020; Tumpach, 2006; Krištofik 2009; Camfferman, 2020; Saxunová, et al. 2009; Hajnal, 2021; Silva, et al 2021; Kainth, 2021; Stewart, 2021; Hillebrandt et al. 2021; Natalizi, 2020; Frintrup, 2020; Lombardi, et al. 2020; Nurunnabi, 2020.

International Accounting Standards for Entrepreneurs IAS/IFRS and International Accounting Standards for Public Administration IPSAS define revenues similarly, but the breakdown of revenues is different. The difference is that public administration entities are specific due to the fact that they are financed through the state budget. These viewpoints are defined by the authors in the publications: Pavic, I. 2020; Sacer, et al. 2020; Kršková, 2011; Mládek, 2005; Sidak et. al., 2020)

Reporting deferred tax liability is important information (for both the entity, and the public authorities) that should be presented in the financial statements of companies (Jensen, 1986; Tancosova, 2014; Lee et al. 2015). The basic structure of financial statements is defined in International Accounting Standards. The authors state, that incorrect presentation of deferred tax liability can be caused by different application of basic accounting principles (Lu, et al. 2014; Tvaronavičienė, 2018; Bernstein, Wild, 1999; Kajanová, 2014a, 2014b; Savina, et al. 2021; Miah, 2021; Polzer, 2021).

3. Revenues according to the legislation of IAS and IPSAS

The basic legal framework for the European Union's accounting is international accounting standards. (Fabus 2015). After the accession of the Slovak Republic to the European Union, it was necessary to harmonize indicators for the evaluation of individual areas of state functioning, this also applies to indicators that express the outputs of the processes of companies and various institutions. And these outputs are represented by double-entry bookkeeping, which we deal with in this article.

International Accounting Standards mean the unification of financial accounting and reporting. This was necessitated by the need to compare and evaluate entities in individual EU countries. The main goal in the countries of the European Union is the effort to unify the accounting of the state and public sector on an accrual basis, while the European Commission recommends the use of International Accounting Standards for entrepreneurs as well as for the public sector.

The International Federation of Accountants (IFAC) plays an important role in relation to international accounting standards. Founded in 1977, the company currently consists of 172 members and partners in 129 countries, representing approximately 2.5 million accountants from practice, education, civil service, industry and commerce. This federation contributes to the development, adoption and implementation of high quality international accounting standards. IFAC publishes manuals, standards and other publications and owns the copyrights. (Kršeková 2011).

FAC has established the International Accounting Standards Board.

At present, there are international accounting standards for:

- Public Sector Accounting Standards (IPSAS), and
- Business entities International Accounting Standards IAS (International Accounting Standards) until 2002, from 1 January 2003 International Financial Reporting Standards - IFRS (International Financial Reporting Standards). Within the European Union, the Commission is working to modernize the management of EU funds. In December 2002, the Commission presented an action plan for the transition to the accrual principle. In practice, this means that a new accounting system called "Accrual Based Accounting" has been introduced since January 2005 and new accounting rules have entered into force.

3.1 Revenues according to the IPSAS

International Public Sector Accounting Standards IPSASs contain a set of 32 standards. IPSASs are aimed at improving the quality and transparency of the public sector financial accounting and reporting, as well as accounting methodologies. Countries such as Switzerland, Austria, the Netherlands, France have already fully or partially implemented this standard in their legislation.

IPSAS deals with revenues under Standard 9 - Revenues from barter transactions and 23 - Revenues from non-exchange transactions (taxes and transfers). Therefore, the issue of revenues is divided into two parts, because public administration entities obtain part of the revenues through transfers and the other part receive outside transfers.

IPSAS - 9 Revenue from Exchange Transactions is used to recognize revenue arising from the following exchange transactions and events: provision of services; sale of goods and products; use of the entity's assets by other parties from which interest, royalties and dividends arise. Revenue is measured at the fair value of the consideration received or receivable, net of any trade discounts and quantity rebates granted to the entity.

IPSAS 23 - Revenue from Non-Exchange Transactions (Taxes and Transfers) addresses revenues generated by public sector entities that result from both exchange and non-exchange transactions, but nevertheless most revenue from governments and other public sector entities typically arises from non-exchange transactions, which are:

- 1. taxes
- 2. transfers, including: - debt forgiveness and commitment - fines and penalties - inheritance - gifts, including goods and products in kind services in kind

3.2 Revenues according to IAS

In the case of the International Accounting Standard for Entrepreneurs, IAS 18 Revenue defines income as follows: Revenue is the gross income on economic benefits that arise from the ordinary activities of an entity in a given period if that income results in an increase in equity other than an increase in deposits from persons with an interest involved. (Tumpach, 2006). Revenue includes only the gross income from economic benefits received or claimed by the entity for its own account. (Šuranová, Škoda 2007). Amounts collected on behalf of third parties, such as sales taxes, taxes on goods and services and value added taxes, are not economic benefits that flow to the unit and do not result in an increase in equity. Therefore, they are excluded from revenue. (IAS - 18 Revenue).

This Standard applies to the accounting for revenue arising from the following transactions and events:

1. sale of goods (goods produced by the enterprise for resale and goods acquired for resale)
2. provision of services (performance of a contractually agreed task by an entity during an agreed contract period)
3. the use of business assets by other parties (for example, interest, royalties, dividends).

Revenue in accordance with IAS 18 is measured at the fair value of the consideration received or receivable, including any related trade and quantity discounts.

Revenues are presented in the financial statements and the presentation of revenues respects the generally accepted principles for their reporting, which are:

1. Accrual principle - costs and revenues are accounted for and reported in the period to which they are temporally and materially related.
2. The precautionary principle - means the presentation of balance sheet and profit and loss account items without raising unduly optimistic expectations.
3. The principle of allocating costs to revenue - revenue is recognized at the time the goods are sold, delivered to the customer or services are rendered.

The above principles imply methods of recognizing revenue. Recognition of income is possible:

- a) at the time of sale (on the day of delivery of the product)
- b) before delivery of the product
- c) after delivery of the product (see Table 1)

Table 1. Revenue recognition alternatives

At the time of sale	Before delivery of the product	After delivery of the product	Special revenues
General rule	Before production	The collected cash	Franchising
Day of sale	(eg. Gift vouchers)	Installment sale	
Retail, service	During production	After covering all the costs	Consignment sale
	(eg. The tunnel construction)		
	At the end of production		
	(eg wheat)		

Source: Financial accounting and management with the application of IAS / IFRS (Křištofik, Šuranová, Saxunová, 2009).

Ad a) Revenue recognition at the time of sale (on the day of product delivery)

This method is based on the principle that the company sells goods or products, sends the object of sale to the customer and the customer pays in cash or on account, and the entity generates sales revenue or cash received or a right to revenue from that product equal to the face value sales (thus a receivable arises).

Ad b) Revenue recognition before product completion

The time of delivery of the product is the moment, which is considered to be the moment of recognition of income, at which doubts fall as to whether the object of sale will be sold and at what price. However, there are cases where it is adequate for revenue to be recognized before delivery of the product. Typical cases of this nature are long-term projects, such as construction contracts when there is a total according to which the seller (builder) can issue invoices to the buyer at intervals at different stages of the project. The buyer has the right to demand a certain amount of performance from the builder, which means that he has ownership rights to the builder's building under construction. The builder has the right to demand from the buyer periodic payments during construction.

Ad c) Revenue recognition after delivery

Revenues from sales when repayment of receivables is uncertain. Revenue is usually recognized when the receivable arises. If the collection of a receivable is uncertain, a provision is usually created for uncollectible receivables. (Krištofík, Šuranová, Saxunová, 2009).

4 Revenues according to the legislation of the Slovak Republic

Revenues from the point of view of accounting are defined in Act no. 431/2002 Coll. on accounting as amended. The rules for accounting for revenues in business entities are contained in the measure of the Ministry of Finance of the Slovak Republic no. 23 051 / 2002-92 laying down the details of the procedures and general chart of accounts for entrepreneurs accounting in the double-entry bookkeeping system. (Farkaš, 2020). For self-government entities, the measure of the Ministry of Finance of the Slovak Republic no. 16786 / 2007-31, which lays down similar details for budgetary organizations, contributory organizations, state funds, municipalities and higher territorial units.

Revenues represent the monetary performance of consumption and wear and tear of assets and the consumption of borrowings in order to achieve revenues. It is an increase in the economic benefits of an entity in an accounting period that can be measured reliably. The generation of revenue creates an opportunity, directly or indirectly, to increase the entity's cash.

Revenues in the double-entry bookkeeping system are recorded in the profit and loss accounts of account class 6 - Revenues. They have an increasing equivalent and are accounted for from the beginning of the accounting period. In this context, we distinguish between revenues and revenues. While income is recognized in the income statement, income is characterized in accordance with the Accounting Act as an increase in cash or an increase in the cash equivalents of an entity and is recognized in the balance sheet accounts.

The following is applied here:

- revenue \neq income (revenue does not have to be the money income)
- income \neq revenue (income does not have to be revenue)
- income = revenue (income is reflected as revenue).

A comparison of the structure of revenues of business entities and self-government entities according to the general chart of accounts is shown in Table 2.

Table 2. Revenue structure by accounting groups

Business entities	Entities of self-government
60 Revenues for own services and goods	60 Revenues for own services and goods
61 Changes in internal inventories	61 Changes in internal inventories
62 Activation	62 Activation
64 Other income from economic activity	63 Tax and customs revenues
65 Settlement of certain items from economic activity	64 Other revenues
66 Financial revenues	65 Settlement of reserves and provisions from transfer and financing activities and accrual settlement
	66 Financial revenues
	67 Extraordinary revenues
	68 Revenues from transfers and budget revenues in state budget organizations and contributory organizations
	69 Revenues from transfers and budget revenues, higher territorial units and in budgetary organizations and contributory organizations established by the municipality or higher territorial unit

Source: own processing based on measure of the Ministry of Finance of the Slovak Republic no. 23 051/2002-92 and 16786/2007-31

When accounting for revenues for both monitored entities, the accrual of revenues is applied through accounts 384 - Deferred income, 385 - Deferred revenues. Accruals mean the application of the accrual principle, ie that costs, expenses, income and revenues are recognized in the accounting period to which they are temporally and materially related. The principle of accrual emphasis emphasizes the independence of accounting periods, which is important in calculating the economic result for the current accounting period.

The main difference between the general chart of accounts between a public administration entity and a business entity is the fact that public administration entities have reserved accounts for:

- tax and customs revenue,
- extraordinary income,
- revenues from transfers and budget revenues in state budget organizations and contributory organizations,
- revenues from transfers and budget revenues, higher territorial units and in budgetary organizations and contributory organizations established by the municipality or higher territorial unit

These accounting groups are important for the specifics of public administration entities, especially for accounting for transfers.

Transfers are not for business entities, as business objects manage their own and foreign resources and not transfers.

5. Comparison of revenue presentation

In the Slovak Republic, information on the entity's income is presented by accounting entities (business entities as well as public administration entities) in the financial statements, specifically in the income statement. (Kajanová, 2014).

5.1 Differences in reported statements

In addition to financial statements, public administration entities are also obliged to submit budgetary and statistical statements.

Budget statement, which is the FIN 1 statement on the implementation of the budget and on un budgeted movements in the accounts of the general government.

The statistical reports are as follows:

- FIN 2 statement on selected data from assets and liabilities of a public administration entity,
- FIN 3 statement of increase / decrease in financial assets and financial liabilities by sector,
- FIN 4 statement on the breakdown of financial assets and financial liabilities by sector,
- FIN 5 statement on loans, issued bonds, bills of exchange and financial leases of a public administration entity,
- FIN 6 statement on the balance of bank accounts and liabilities of municipalities, higher territorial units and budgetary organizations established by them.

Budget and statistical statements are therefore obliged to be submitted by public administration entities, as these entities are recipients of funds from the state budget and the state monitors the drawing of funds through these statements.

Since 1 January 2014, the budget information system for self-government - RIS.SAM, has been introduced in the Slovak Republic, in the system of which public administration entities enter budget, statistical statements as well as a profit and loss statement. The RIS.SAM project is guaranteed by the Ministry of Finance of the Slovak Republic (MF SR) and the Association of Towns and Municipalities of Slovakia (ZMOS), while this system brings a significant improvement in IT budget support.

If the city or municipality used its own information system before 2009, which fully covered the needs in the area of budget management and program budget management, RIS SAM uses automated data transfer from the original system to the new, free application (RIS.SAM). In this case, there was no duplication of work performed, because it continues to use its information system and the connection to RIS.SAM is automated.

We formulate the benefits of this system as follows:

- simplification and clarity of work with budget information for users at all levels of management,
- simple work with a unified information system, not requiring specific IT skills,
- maintaining autonomy in the use of existing local economic information systems,
- guaranteeing compliance with legislative requirements in the area of budgeting in the required time,
- free incorporation of all methodological changes within the system,
- free provision of connection to the Communication and Technological Infrastructure of the Ministry of Finance of the Slovak Republic as well as to the system itself,

- user support, provided by experts in the DataCentre User Support Center, an organization of the Ministry of Finance of the Slovak Republic that manages public finance information systems and provides support to their users,
- support of program budgeting (creation of program structure, definition of objectives, measurable indicators, creation of monitoring and evaluation reports)

The RIS.SAM system has several key features that guarantee its suitability for self-government:

- budget support at the level of the city, municipality and their subordinate organizations,
- draft and approval of the budget, budget adjustments, recording of drawing, program budget,
- manual entry or import of data,
- central application management, integration with third party systems,
- secure operation via a communication line to the DataCenter,
- outputs for reporting, press reports,
- clarity, intuitive operation, user support, free training,
- joint project of the Ministry of Finance of the Slovak Republic, Association of Towns and Villages and the Union of Slovak Cities.

The RIS SAM system in Slovakia has the obligation to use all municipalities, cities and the city district currently means 2,927 entities.

Common aspects of reporting

Public administration entities as well as business entities have published financial statements in the registers of financial statements. The Register of Financial Statements is a public administration information system in which financial statements and auditor's reports are stored. The legislatively mentioned register is regulated by § 23 of Act no. 431/2002 Coll. on accounting as amended. The register of financial statements is a central place of storage and a single place of publication of financial statements, which contains a database of data on legal and natural persons in the range of data provided by financial statements. The registry administrator is the Ministry of Finance of the Slovak Republic. The Register of Financial Statements in the Slovak Republic has been operating since 1 January 2014. Pilot operation of the Register of Financial Statements, which was created in cooperation with the Slovak Chamber of Tax Advisers, the Slovak Chamber of Auditors and the Slovak Association of Corporate Financiers,

The register is divided into a public and a non-public part. In the public part, the financial statements of companies, cooperatives, state enterprises, public administration entities, accounting units that account in accordance with international accounting standards are available. Documents from the public part of the register of financial statements are made available in electronic form via the portal www.registeruz.sk.

In the non-public part there are the financial statements of accounting units that are not in the public part. These include, in particular, the financial statements of business entities - individuals and non-profit organizations, foreign branches, organizational units that are not required to disclose.

The publication of financial statements in the register of financial statements is as follows:

1. documents prepared in paper form are delivered to the tax office, which converts them into electronic form and then forwards them to the RÚZ;

2. documents prepared in electronic form are delivered via the financial administration portal (www.financnasprava.sk);

3. Public administration entities deliver documents through the system of State Treasury.

The register of financial statements for the period 2009 - 2021 contains the following documents:

- number of accounting units with at least one financial statement - 2,012,187 pcs
- number of financial statements - 4,577,7115 pcs
- total number of individual financial statements - 9,123,979 pcs
- total number of attachments - 6,449,791 pcs

Advantages of the register of financial statements for entrepreneurs as well as for public administration entities:

- Elimination of administrative burdens of business entities
- Fight against tax fraud
- Transparent monitoring of public funds - as the register contains financial statements of public administration entities.

Conclusions resulting from the control activities of the Financial Administration of the Slovak Republic

The financial administration, through the tax offices, ensures the control activities of individuals and legal persons (business entities). At the beginning of the business activity, they are obliged to register with the locally competent tax office. Since 2019, business entities have been communicating exclusively electronically to the tax office.

Legal entities report profit, or loss as the difference between income and expenses, and this is the basis for calculating corporate income tax. Individuals (persons doing business on the basis of a trade license) report the profit or loss as the difference between income and expenses. Table 3 contains the number of business entities in the Slovak Republic.

Table 3. Number of business entities (individuals and legal persons) in the period 2018-2020

YEAR	Number of registered individuals	Number of registered legal persons
2018	3.124.373	294.396
2019	3.241.894	306.622
2020	3.355.264	322.235

Source: Annual Report of the Financial Administration of the Slovak Republic

The above table shows a slight increase in the number of legal and individuals with a comparison with data from 2018 to 2020. This increase may be due to the introduction of electronic communication with the Financial Administration of the Slovak Republic, which results in a reduction in administrative burdens (see Table 4).

Table 4. Overview of findings from inspections carried out by tax authorities in the period 2018 - 2020

YEAR	Corporate income tax	Personal income tax
2018	107.450	11.018
2019	118.032	21.286
2020	146.858	8.842

Source: Annual Report of the Financial Administration of the Slovak Republic - from 2018 to 2020 in thous. Eur

Due to the fact that the Financial Administration of the Slovak Republic does not have the opportunity to perform a tax audit of every tax subject, the effectiveness of tax audits and the correct selection of audited entities play an important role. The state also secures the revenue part of the state budget through control activities.

References

- Ahmed Riahi-Belkaoui, (2000). *Accounting Theory*, Business Press, ISBN 9781861525208
- Bernstein, L.A., Wild, J.J. (1999). *Analysis of Financial Statement*. New York: *Irwin McGraw – Hill*, ISBN 0-07-094504-7
- Camfferman, K. 2020. International Accounting Standard Setting and Geopolitics. *Accounting In Europe*, 17(3), 243-263
<http://doi.org/10.1080/17449480.2020.1795214>
- Drury, C. (2017). *Management and Cost in Accounting*. Cengage, ISBN: 9781473748873
- Epstein, B.J., Mirza, A. A. (2006a). *Interpretation and Application of IFRS*. New Jersey: Wiley, ISBN 0-471-72688-5
- Epstein, B.J., Mirza, A. A. (2006b). *International Accounting Standards*. Hoboken, Nj: Wiley, ISBN 0471726885
- Fabus, M. (2015). Impact of foreign direct investment on unemployment development in selected regions of Slovak Republic. *Economic Annals XXI*, 19(155), 63-66. [http://soskin.info/userfiles/file/Economic-Annals-pdf/S155-0014\(14\)063.pdf](http://soskin.info/userfiles/file/Economic-Annals-pdf/S155-0014(14)063.pdf)
- Fabus, M. (2018). Business environment analysis based on the Global Competitiveness Index (GCI) and Doing Business (DB): case study Slovakia. *Journal of Security and Sustainability Issues*, 7(4), 831-839. [http://doi.org/10.9770/jssi.2018.7.4\(18\)](http://doi.org/10.9770/jssi.2018.7.4(18))
- Farkaš, R. (2020). *Financial statement of trading companies*, Bratislava: Wolters Kluwer, ISBN 978-80-571-0247-2
- Frinrup, M., Schmidhuber, L., Hilgers, D. 2020. Towards accounting harmonization in Europe: a multinational survey among budget experts. *International Review of Administrative Sciences*, Article Number 0020852320915640
<http://doi.org/10.1177/0020852320915640>
- IAS - 18 Revenue - <https://www.ifrs.org/issued-standards/list-of-standards/ias-18-revenue/>
- Jensen, M. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76(2)
- Hajnal, G. (2021). Illiberal challenges to mainstream public management research: Hungary as an exemplary case. *Public Management Review*, 23(3), 317-325. <https://doi.org/10.1080/14719037.2020.1752038>
- Hellmann, A., Patel, C. (2021). Translation of International Financial Reporting Standards and implications for judgments and decision-making. *Journal Of Behavioral And Experimental Finance*, 30, Article Number100479 <http://doi.org/10.1016/j.jbef.2021.100479>

Hillebrandt, M. & Leino-Sandberg, P. (2021). Administrative and judicial oversight of trilogies. *Journal of European Public Policy*, 28(1), 53-71. <https://doi.org/10.1080/13501763.2020.1859598>

Mládek, R. (2005). *World accounting. IFRS. US-GAAP*. Praha: Linde, ISBN 80-7201-519-2

Kajanová, J., Ölvecká, V., Saxunová, D. (2014a). *Evaluation of property and capital structure*. Praha: Wolters Kluwer - 88 s.

Kajanová, Jana (2014b). *Analysis of the development of the tax system of the Slovak Republic after the accession to the European Union in Slovakia* - Plzeň: Aleš Čeněk, p. 64-78. - ISBN 978-80-7380-520-3

Kainth, A., Wahlstrom, RR. (2021). Do IFRS Promote Transparency? Evidence from the Bankruptcy Prediction of Privately Held Swedish and Norwegian Companies, *Journal of Risk And Financial Management*, 14(3), Article Number123
<http://doi.org/10.3390/jrfm14030123>

Kršková, M. (2011). *International Public Sector Accounting Standards - IPSAS*. Bratislava: Wolters Kluwer, ISBN978-80-8078-390-7

Křištofík, P., Saxunová, D., Šuranová, Z. (2009). *Financial accounting and management with the application of IAS/IFRS*, Bratislava: Wolters Kluwer, ISBN: 978-80-8078-230-6

Lee, M., Yin, X., Lee, S., Weng, D. H., & Peng, M. (2015). The impact of home country institutions on new venture export: examining new ventures in transition economies. *International Entrepreneurship & Management Journal*, 11(4), 823-848.
<https://doi.org/10.1007/s11365-014-0316-5>

Lu, J., Liu, X., Wright, M., & Filatotchev, I. (2014). International experience and fdi location choices of Chinese firms: the moderating effects of home country government support and host country institutions. *Journal of International Business Studies*, 45(4), 428-449.
<https://doi.org/10.1057/jibs.2013.68>

Lombardi, R., Schimperia, F., Smarra, M., Sorrentino, M. (2020). Accounting for infrastructure assets in the public sector: The state of the art in academic research and international standards setting. *Public Money & Management*, 41(3), 203-212.
<http://doi.org/10.1080/09540962.2020.1840761>

Miah, MS., Jiang, HY., Rahman, A., Stent, W. (2021). The impact of IFRS complexity on analyst forecast properties: The moderating role of high quality audit. *International Journal of Finance & Economics* <http://doi.org/10.1002/ijfe.2456> JAN 2021 Early Access

Miah, MS. (2021). Does IFRS convergence bring improvement in firm performance? An empirical analysis. *Journal of Chinese Economic and Business Studies*, 19(1), 95-107. <http://doi.org/10.1080/14765284.2020.1846010>

Natalizi, D. (2020). Public sector accounting contexts in the EPSAS change: a comparative study of Italy and Sweden. *International Review of Administrative Sciences* 0020852319894680 <http://doi.org/10.1177/0020852319894680>

Nurunnabi, M. (2020). International public sector accounting standards (IPSAS): current status, practices and future agenda. *International Journal of Public Sector Management*, 33(2/3), 113-115, Special Issue SI, <http://doi.org/10.1108/IJPSM-04-2020-345>

Pavic, I. (2020). Analysis of Changes in International Financial Reporting Standards And Its Effects On Comparability And Consistency Of Financial Statements. *Ekonomski Pregled*, 71(4), 331-357 <http://doi.org/10.32910/ep.71.4.2>

Polzer, T., Grossi, G., Reichard, C. (2021). Implementation of the international public sector accounting standards in Europe. Variations on a global theme, *Accounting Forum* <http://doi.org/10.1080/01559982.2021.1920277> APR 2021

Roca, F. (2021). The influence of mandatory adoption of IFRS in Argentina on value relevance of accounting information. *Journal of Applied Economics*, 24(1), 154-172. <http://doi.org/10.1080/15140326.2021.1900695>

Putihin, Y.E., Akimova, Y.N., Ostrovskaya, NV., Manvelova, IA., Negashev, EV. (2020). Conceptual Approaches to Classification of National Accounting Systems. *Bulletin of The National Academy of Sciences of The Republic of Kazakhstan*, 2, 111-118
<http://doi.org/10.32014/2020.2518-1467.49>

Saxunová, D. et al. (2009). *Financial accounting and management in the perspective of IAS/IFRS*. Banská Bystrica: Faculty of Finance. ISBN: 80-8083-022-3

Sidak M., Hajnišová, E., Fabuš, M. (2020). European Central Bank: security, sustainable and efficient aspects. *Journal of Security and Sustainability Issues*, 10(2), 31-38. www.tb.lt/Leidiniai/SSI/Security_and_Sustainability_Issues.htm

Silva, AP., Fontes, A., Martins, A. (2021). Longitudinal Perceptions Of Enforcement Mechanisms In An Ifrs-Based Accounting Reform, *Polish Journal Of Management Studies*, 23(2), 495-511 <http://doi.org/10.17512/pjms.2021.23.2.30>

Savina, N., Pozniakovska, N., Miklukha, O. (2021). Conceptual Framework For Financial Reporting: Integrated Policy. *Financial And Credit Activity-Problems Of Theory And Practice*. 1(36), 76-83. BANKING UNIV. ISSN 2306-4994, ISSN 2310-8770 WOS:000645131200008

Silva, A., Jorge, S., Rodrigues, LL. (2021). Enforcement and accounting quality in the context of IFRS: is there a gap in the literature? *International Journal of Accounting and Information Management* <http://doi.org/10.1108/IJAIM-08-2020-0126> JAN 2021 Early Access

Stewart, E., Connolly, C. (2021). Recent UK Central Government Accounting Reforms: Claimed Benefits and Experienced Outcomes, *Abacus-A Journal of Accounting Finance and Business Studies* <http://doi.org/10.1111/abac.12222> MAY 2021 Early Access

Sacer, I.M., Zyznarska-Dworczak, B. (2020). Assets Measurement Principles According to Croatian and Polish Accounting Standards, *Croatian Economic Survey*, 22(1), 41-64 <http://doi.org/10.15179/ces.22.1.2>

Šuranová, Z., Škoda, M. (2007). *International accounting*. Banská Bystrica: Faculty of Economics UMB, ISBN 978-80-8083-438,8

Tumpach, M. (2006). *International Standards for the Preparation of Financial Statements, IFSR/IAS*. Bratislava: Iura Edition, ISBN 80-8078-072-2

Tancosova, J. (2013, September). Foreign direct investments and their influence on the economic development of Slovakia. *Economic Annals-XXI*, 3-4(1), 31-34. Retrieved from <http://soskin.info/ea/2013/3-4/zmist.html>

Tancosova, J. (2014, March). Investment attractiveness of Slovak republic and its determinants. *Economic Annals-XXI*, 3-4(1), 8-11. Retrieved from http://soskin.info/userfiles/file/2014/3-4_2014/1/Tancosova.pdf

Tawiah, V., Gyapong, E. (2021). International financial reporting standards, domestic debt finance and institutional quality: Evidence from developing countries, *International Journal Of Finance & Economics* <http://doi.org/10.1002/ijfe.2575> MAY 2021 Early Access

Tvaronavičienė, M. (2018). Toward efficient policy making: forecasts of vulnerability to external global threats, *Journal of Security and Sustainability Issues*, 7(3), 591-600. [https://doi.org/10.9770/jssi.2018.7.3\(18\)](https://doi.org/10.9770/jssi.2018.7.3(18))

Wijekoon, N., Samkin, G., Sharma, U. (2021). International financial reporting standards for small and medium-sized entities: a new institutional sociology perspective. *Meditari Accountancy Research* <http://doi.org/10.1108/MEDAR-06-2020-0929> JUN 2102 Early Access

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FACTORS AFFECTING HOUSING CONDITIONS: A CASE STUDY OF CITTASLOW TOWNS IN POLAND

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Abstract. The concept of slow cities - "cities of good life" - promoted among small and medium-sized cities, results directly from the idea of sustainable development, which sets as a primary objective the reduction of poverty and increasing the standard and quality of life. The quality of life is understood as ensuring good housing conditions, access to services, health care and education, care for the natural and cultural environment, increasing economic activity and development with respect for spatial order and sustainable development principles. Housing conditions are one of the main determinants of the quality of life. Other decisions such as getting married, starting a family or changing jobs often depend on having adequate housing. The housing situation in Poland in comparison with the majority of EU countries is unfavorable, both in terms of the number of dwellings as well as their quality. Therefore, the aim of this research was to assess the housing situation and the factors influencing it in the towns associated in the Polish National Cittaslow Network in Warmińsko-Mazurskie Voivodeship. In the majority of cities, housing conditions were classified as medium or mediocre. Additionally, the cities were assessed in terms of their economic, demographic and investment potential, which made it possible to construct a synthetic index of their development. The level of the synthetic indicator was influenced most by the demographic, economic and investment situation. Moreover, a weak positive correlation was observed between the synthetic indicator and the housing situation. This means a weak influence of the synthetic indicator on the housing situation and vice versa. Demography in the examined Cittaslow cities influences the general development potential more strongly than housing. Therefore, city leaders should focus on creating instruments and solutions for improving demographic indicators. This is all the more justified, as the long-term forecast shows that this area may improve. This would make it possible to avoid threats resulting from deterioration of the economic and investment situation, and further on - housing.

Keywords: housing conditions; quality of life; Cittaslow network; sustainable development

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JEL Classifications: I31, J11, O12, O18

1. Introduction

Housing conditions are among the determinants of living conditions and quality of life. Being among the most expensive durable consumer goods, a flat is usually high in the hierarchy of households' needs and priorities. It has a significant impact on the social environment, providing the base for proper living conditions. Housing availability – due to its immobility, high capital intensity, long period of return on investment and a relatively low adaptability to the user's needs, which vary in time and generally increase – makes it strategically important from the point of view of life quality and individual well-being.

Definitions of life quality treat it as a set of conditions of human life, objective attributes of the world of nature, things and culture, objectively evaluated human attributes related to one's living standard and social position, as well as the proper functioning of his/her body (Sęk 1993). However, a multidimensional analysis of life quality is more frequent (Kuc-Czarnecka 2019). Wejnert (2001) reports that, based on large samples, American scientists concluded that a subjective evaluation of life quality includes an analysis of 823 factors which reflect various aspects of a life situation. Further analyses helped to identify a set of factors, which was reduced to 123 life issues and subsequently, 30 inter-related groups of life issues were identified. Cummins (1996) analysed 27 definitions of life quality and found the majority of them to include five dimensions: emotional welfare (85%), health (70%), family and social relations (70%), material wealth (59%), a job and other forms of activity (56%). Furthermore, many studies confirm that these areas are seen as the most important to the respondents. Further analyses revealed another two dimensions: *confidence, safety and functioning in the community*. Andrews and Inglehart (1979) show that four spheres of life: a job, family situation and income are of key importance to the global evaluation of members of the society.

The above shows that an evaluation of life quality should take into account mainly the basic factors, which include: economic conditions, housing conditions, free time, social security, human natural environment, health and social environment.

Compared to other EU countries, the housing situation in Poland is unsatisfactory, both qualitatively and quantitatively. This is shown in many publications and comparative statistics performed by Eurostat. This issue has been widely debated in the Polish literature, both with respect to developing effective housing policy (e.g. Cesarski 2013; Herbst 2013), and social housing policy (Lis 2011; Przymeński & OliwaCiesielska 2014). Studies are conducted of the housing conditions of various social groups, e.g. young married couples (Korniłowicz 2003; Ulman & Wałęga 2012) and elderly people (Zrałek 2012; Zubrzycka-Czarnecka 2012). Issues related to the housing standard, including the extent to which flats are equipped with infrastructure (Wilczek 2014; Janusz 2020) and housing deprivation (Napiórkowska-Baryła & Witkowska-Dąbrowska 2018) are also dealt with as well as financing the housing market (Bryx 2001; Główna 2012) and improving the availability of flats for rent (Urbańska 2008; Życiński 2008).

Housing quality is also the domain of the sustainable development concept. Global objectives of sustainable development with respect to housing were expressed most fully during the UN global conference on human settlements (Habitat II, Istanbul, 1996). At the same time, the "City Summit" was held there, at which it was pointed out that, at present, it is towns that shape the face of the earth and, therefore, implementing sustainable development on a global scale must start with the local and regional scale of the city (Alberti 1997). The New Urban Agenda was adopted at the Habitat III conference in Quito in 2016. Its section 1 presents a vision of cities and human settlements good for living, which: "fulfil their social function, including the social and ecological function of land, with a view to progressively achieving the full realization of the right to adequate housing as a component of the right to an adequate standard of living, without discrimination, universal access to safe and affordable drinking water and sanitation, as well as equal access for all to public goods and quality services in

areas such as food security and nutrition, health, education, infrastructure, mobility and transportation, energy, air quality and livelihoods”.

Alternative ways of everyday life and development are sought, particularly in the contemporary world, during the period of globalisation of the past 30 years, which is a source of many processes and phenomena, with quantity, speed and intensity being the main goals. Such opportunities are offered by towns developing according to the *slow city* concept. Towns, which “oppose the quantity-oriented to quality-oriented development, and replace rapid housing growth and location of large business entities with environment- and resident-friendly investments which guarantee “places of good living” based on endogenous development factors, often contrary to the globalisation trends in the economy and social life, including mass consumption” (Kaczmarek 2019). The *slow city* concept arises directly from the sustainable development concept, whose prime goal is to reduce poverty and to increase the standard and quality of life.

The concept of *slow city* and the global *slow city* movement and the Cittaslow network that grew out of it has its source in the idea of *slow* in various spheres of social and economic life, which has been promoted since the 1980s. The *slow* movement, which had its beginning in *slow food*, started to refer to the territorial dimension on various spatial scales: neighbourhood (*slow housing*), local (*slow city*), regional (*slow region*) and even global (*slow planet*) (Kaczmarek 2019).

Currently, the International Cittaslow Network (cities of good living) includes 272 towns in 30 countries, with 34 Polish towns, 25 of which are situated in Warmia and Mazury. The Polish National Cittaslow Network has two “supporting members” – the Warmińsko-Mazurskie Voivodeship and the District of Olsztyn¹. This phenomenon has been described quite extensively in the literature – both Polish (Farelnik & Stanowicka 2016, Farenik et al. 2021, Batyk & Woźniak 2019, Kaczmarek 2019, Zadęcka 2017, Wierzbicka 2020) and foreign (Knox 2005, Mayer & Knox 2006, Radstrom 2011). The idea of Cittaslow is part of the sustainable city concept, i.e. one in which the socio-economic goals are harmonised with issues of environmental conservation and energy use to ensure the continuity of change (Banachowicz & Danielewicz 2006). It should be understood as increasing the population’s wealth, improving the level of safety in a friendly social environment and constant improvement of the natural environment, as well as increasing the spatial order level and improving the functionality of urban spatial structures. The idea of the international Cittaslow movement involves promoting the culture of good and harmonious life in smaller towns, which is an alternative to the big-city bustle and globalisation. Towns-members of the Network make efforts to achieve the state of sustainable development, to create an urban policy which ensures proper relations between the economic growth, environment conservation and improvement of the residents’ quality of life. Local authorities and local communities focus on: sustainable development of towns with the use of local resources, improvement of the residents’ life quality by such measures as creating the proper urban infrastructure and places for leisure, environmental conservation and promoting pro-environmental attitudes among the population, caring about cultural values, restoration of monuments of architecture and the appearance of towns, propagating the culture of hospitality, as well as by a rich cultural offer for the residents and tourists, proper promotion of such assets, promotion of local products, craft and cuisine and elimination of architectural barriers for the disabled (Cittaslow Manifesto)².

2. Methods

As was established, housing conditions are among the main determinants of living conditions. Therefore, the objective of this article is to assess the housing situation in Cittaslow towns in the Warmińsko-Mazurskie Voivodeship. The real estate market and the housing situation are affected by economic, socio-demographic, legal

¹ Cittaslow Manifesto <https://www.cittaslow.org/content/association> 20.12.2020

² LIVE SLOW: a different side of modernity. Cittaslow Manifesto for the new humanism of being and living. Pdf. Downloaded from <https://www.cittaslow.org/> 20.12.2020.

and resource-related factors (Gawron 2011). At the first stage, the towns under study were assessed for their economic, demographic and investment-related situation, and the assessment results were then used to construct a synthetic development index, further in this paper referred to as the synthetic index. Subsequently, the effect of the synthetic index and its components on the housing situation was determined.

The Cittaslow network can include small and medium-sized towns³, which are in the greatest danger of depopulation (Lesińska & Matuszczyk 2019; Śleszyński 2018). Therefore, a hypothesis was adopted that demographic factors have the greatest impact on the housing situation.

The demographic, economic, investment and housing situation was diagnosed by the statistical method. The 2010-2019 data for analysis were obtained from the Local Data Bank at the Statistics Poland. The analysis was performed for 23 units – Cittaslow movement members in 2019 situated in the Warmińsko-Mazurskie Voivodeship:⁴

- Seven urban communes: Bartoszyce, Górowo Iławeckie, Braniewo, Działdowo, Lubawa, Lidzbark Warmiński, Nowe Miasto Lubawskie,
- 15 urban areas within urban-and-rural communes: Bisztynek, Sępól, Lidzbark, Ryn, Reszel, Orneta, Nidzica, Olecko, Barczewo, Biskupiec, Dobrze Miasto, Jeziorany, Olsztynek, Pasym, Gołdap,
- One rural commune: Wydminy.

Ten indices, from two to five in each section, were defined and classified as stimulants (7) and destimulants (3) in order to determine which element – demographic, economic, investment situation – has the greatest impact on the synthetic index (Table 1) (Pieloch-Babiarz, 2020). The analysis was performed for urban communes, urban areas in urban-and-rural communes and one rural commune. This choice of the sample restricted the number of indices for analysis. The demographic situation was characterised by six partial indices, one of which (deaths per 1,000 residents) is a destimulant. A larger number of deaths contributed to a deterioration of the demographic situation. Among the factors with a positive impact included the number of marriages per 1,000 residents, the number of live births per 1,000 residents, population density, change of the population size per 1,000 residents and the working-age population in the total population. The economic situation was characterised by two partial indices, with the registered unemployed percentage being the destimulant and the number of business entities per 10 thousand residents being a stimulant. The number of unemployed in the whole commune was used in the urban areas of the urban-and-rural communes in the absence of data for the area under analysis. The percentage of the area covered by local plans in the total area and the percentage of legally protected area in the total commune area are two indices used to analyse the investment situation. The former is a stimulant and the latter is a destimulant. The proportion of the area covered by the local plans in the whole commune was used in the urban areas of the urban-and-rural communes in the absence of data for the area under analysis. To diagnose the housing situation, six partial indices were identified, four of which are stimulants: average flat floorage area, average flat floorage area per person, number of flats per 1,000 residents, average number of rooms in a flat and two destimulants: average number of persons per flat and average number of persons per room (Table 1).

³ The classification adopted by Zadęcka (2018, p. 94), based on the population criterion, according to which small towns are those with a population of up to 20 thousand, medium-sized cities - those with a population of 20 to 100 thousand and big cities – over 100 thousand.

⁴ Further towns in the Warmińsko-Mazurskie Voivodeship joined the network on 18 December 2020: Morąg and Szczytno, which were not included in this study.

Table 1. The indices characterising the demographic, economic and housing situation

Partial indices	S/D*
Demographic situation	
Marriages per 1000 people	S
Live births per 1000 people	S
Deaths per 1000 people	D
Population density	S
Change of population size per 1000 people	S
Percentage of the working-age population in the total population	S
Economic situation	
Registered unemployed in total population	D
Entities entered in the REGON database per 10,000 people	S
Investment situation	
The portions of the area covered by the local plans in the total area	S
Proportion of legally protected areas in the commune area	D
Housing situation	
Average flat floorage area	S
Average flat floorage area per person	S
Number of flats per 1000 residents	S
Average number of rooms per flat	S
Average number of people per flat	D
Average number of people per room	D

*S – stimulant; D – destimulant

Source: Prepared by the author based on the Local Data Bank

In order to avoid excessive internal correlations between indices, the coefficient of variation was used and variables with indices under 20 were excluded from the analysis. Further elimination of intercorrelated variables produced a variable correlation matrix and the reverse matrix method was used for the variable discrimination, with the diagonal elements of the matrix taking values from 1 to ∞ . Their maximum level was taken as $(\hat{r}_0 \leq 10)$ (Panek 2009). The variables above this value were eliminated from further analysis.

The study was performed by the taxonomic development measure of Z. Hellwig, which enables hierarchisation of the units with respect to their demographic, economic, investment and housing situation (see: Korzeb & Niedziółka 2020, Piersiala 2019, Stec 2011, Świdnyńska 2017). The higher the value of the index, the higher its development level (Klosa & Widera 2017).

Based on the study findings, the units were ranked from the highest to the lowest development level depending on the demographic, economic, investment and housing situation and classified into four classes [Wysocki 2010].

- I: communes with a good situation:

$$d_i \geq \bar{d}_i + S_{d_i}$$

- II: communes with a medium situation:

$$\bar{d}_i \leq d_i < \bar{d}_i + S_{d_i}$$

- III: communes with a mediocre situation:

$$\bar{d}_i - S_{d_i} \leq d_i < \bar{d}_i$$

- IV: communes with a bad situation:

$$d_i < \bar{d}_i - S_{d_i}$$

where:

d_i – synthetic measure calculated by the Hellwig development pattern method;

\bar{d}_i – arithmetic average of the synthetic measure d_i

S_{d_i} – standard deviation of the synthetic measure d_i .

The relationship between the synthetic index made up of the indices that characterise the demographic, economic and investment situation, and the housing situation was measured by the Pearson linear correlation index.

The stepwise regression method, which allows for determining the most important variables of the set of explanatory variables that have an impact on the response variable, was applied to determine which of the elements affecting the synthetic index had the greatest effect on its level.

The next step involved the determination of the development prospects for the demographic, economic, investment, general (determined by the synthetic index) and housing situation. The current situation is likely to remain unchanged within the predictability horizon (Peitgen, et al., 2002). The logistic function, used to model various growth processes, was used in the study, according to which the growth rate decreases with time to reach the limit at the final phase. It was used in the study because of its good fit to the historical data. In order to apply it practically, it was modified by introducing three constant parameters which determined its course – a, b and c (Grzegorek & Wierzbicki 2009):

$$y = \frac{a}{1+b \exp(-c \times t)} \quad (3)$$

where:

$a, b, c \geq 0$,

a – saturation of the phenomenon, determined heuristically,

b, c – function parameters selected by the statistic estimation.

The maximum development level estimated by the Hellwig development pattern is 1, which is why the parameter "a" was established at this level in the study. The statistic and analytical software STATISTICA and 2010-2019 data were used to calculate the b and c parameters of the logistic function, which were used to identify the development trends until 2029 and to create graphs for average values achieved for the units.

3. Results

The statistical verification results were used to choose those indices from the set determining the demographic, economic and investment situation (Table 1) that are characterised by a high coefficient of variance ($V > 20$) and that are uncorrelated with each other ($r_0 < 10$). All the indices taken for analysis met those criteria. The Hellwig development pattern method was used to create indices which described the demographic, economic and investment situation in the units under study and they were grouped into four classes depending on their state.

The situation in the units under study in 2019 was the best in terms of the economic situation – it was good or medium in 60% of them. The investment situation was mediocre or bad in nearly 70% of them (Table 2).

Table 2. The proportion of the units under analysis in individual classes in 2019, showing their demographic, economic and investment situation and the synthetic index

Class	Situation			Synthetic
	Demographic	Economic	Investment	
1 – good situation	13	17	13	9
2 – medium situation	35	43	17	39
3 – mediocre situation	39	22	65	39
4 – bad situation	13	17	4	13

Source: Prepared by the author based on research

The best demographic situation in 2019 was observed in Nidzica and the worst was in Sępól. The best economic situation was in Sępól and the worst was in Lidzbark. The best investment situation was observed in Dobrze Miasto and the worst was in Lidzbark Warmiński. Only one unit was in the same demographic class – Działdowo (class I) – throughout the period under analysis (2010-2019). High variance was observed in this regard for four units throughout the period under analysis and it manifested itself by the fact that they were categorised into each of the defined classes (Biszynek, Olszynek, Pasym and Sępól). Units with a medium or mediocre demographic situation dominated during the period under study. Units with a low and high state accounted for the smallest share (Fig. 1).

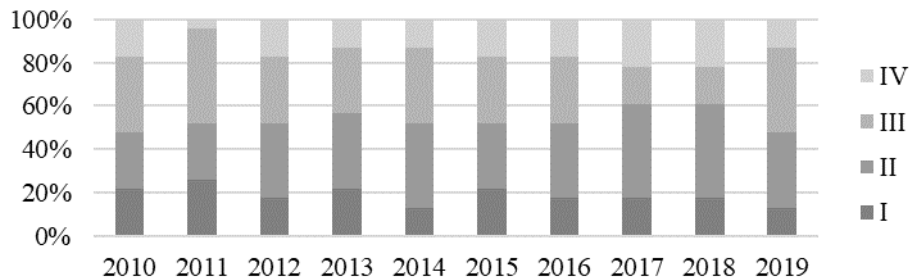


Fig. 1. Proportion of the units under analysis in individual classes in the years 2010-2019 with respect to the demographic situation

Source: Prepared by the author based on research

The economic situation in the units under study was much more stable. Four units did not change their class during the 2010-2019 period: Olecko (I), Biskupiec and Lubawa (II), Nowe Miasto Lubawskie (IV). Steady improvement was observed in three units: in Górowo Iławeckie and Sępól (from class IV, through III to II) and Orneta (from class III to II). Górowo Iławeckie and Sępól are the only units which belonged to the largest number of classes during the analysed period (3). Units with a medium or mediocre economic situation dominated during the period under study. The proportion of units with good and bad situations was the smallest (Fig. 2).

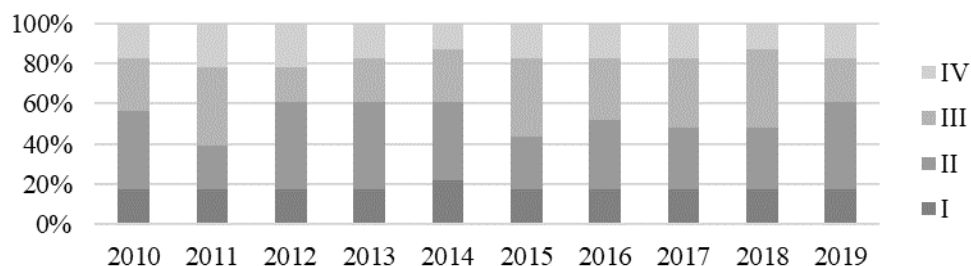


Fig. 2. Proportion of the units under analysis in individual classes in the years 2010-2019 with respect to the economic situation

Source: Prepared by the author based on research

The investment situation was highly stable. Only two units changed their classes during the period under analysis – Nowe Miasto Lubawskie from I to III and Lidzbark from II to III. Units with a mediocre investment situation dominated during the period under study. Those with a bad situation accounted for the smallest share (Fig. 3).

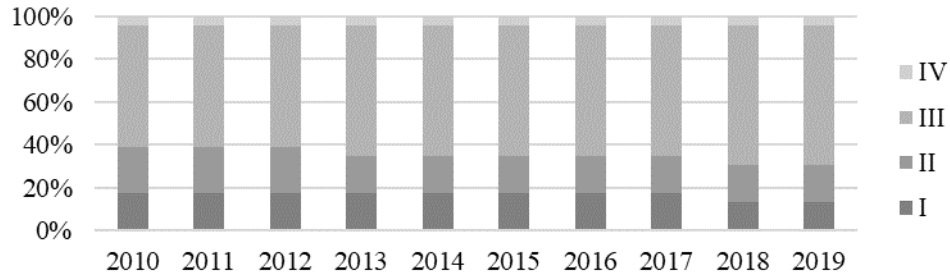


Fig. 3. Proportion of the units under analysis in individual classes in the years 2010-2019 for the investment situation

Source: Prepared by the author based on research

An analysis of the synthetic index made up of partial indices which determine the demographic, economic and investment situation revealed high variability in the units under study. Only two of them (Wydminy and Olecko) were in the same class throughout the study (IV and II, respectively). The classification of two units (Lidzbark and Pasym) changed within the four classes during the 2010-2019 period. Classification of the largest number of units changed within three classes. The proportion of units in a medium and mediocre state dominated during the entire period. The number of units in the good and bad state was the smallest (Fig. 4).

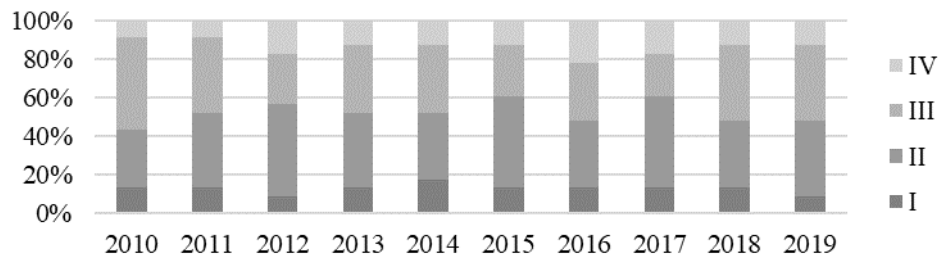


Fig 4. The proportion of the units under analysis in individual classes in the years 2010-2019 with respect to the general situation

Source: Prepared by the author based on research

The stepwise regression method was applied to determine which of the elements that affect the synthetic index has the greatest impact on it. The model developed for all the units under study (2019 data) explained 99% of the synthetic index variance. The high multiple variance coefficient ($R=0.99$) indicates a strong link between the synthetic index and the three areas under study (the demographic, economic and investment situation). A high level of F and the corresponding level of test probability p confirmed a statistically significant linear relationship. The value of t showed that the absolute term and the regression coefficient differ significantly from zero.

The synthetic index level was affected to the greatest extent by: the demographic, economic and investment situation (Table 3). This relationship means that if the demographic situation improves by 1, the synthetic index will increase by 0.81 *ceteris paribus*; if the economic situation improves by 1, the synthetic index will increase by 0.38 *ceteris paribus*; if the investment situation improves by 1, the synthetic index will increase by 0.26 *ceteris paribus*.

Table 3. Significance of the synthetic index components

Demographic situation	Economic situation	Investment situation
0.81	0.38	0.26

Source: Prepared by the author based on research

The results of statistical verification were used to choose those indices from the set determining the housing situation (Table 1) that were characterised by a high coefficient of variance ($V > 20$) and that were uncorrelated with each other ($r_{ij} \leq 10$). Three variables were taken for analysis: average flat floorage area per person, number of flats per 1,000 residents and the average number of people per room.

The housing situation was good or bad in 9% of the units, it was medium in 43% of the units and mediocre in 9% in 2019. The housing situation was highly stable in 2010-2019. A change of class did not take place in 12 units – they were in the same class throughout the study period. Changes in the other units took place within one class. Units with the medium or mediocre housing situation dominated throughout the period under study. The proportion of those with a low state was the smallest (equal to those with the high state from 2017 onwards) (Fig. 5).

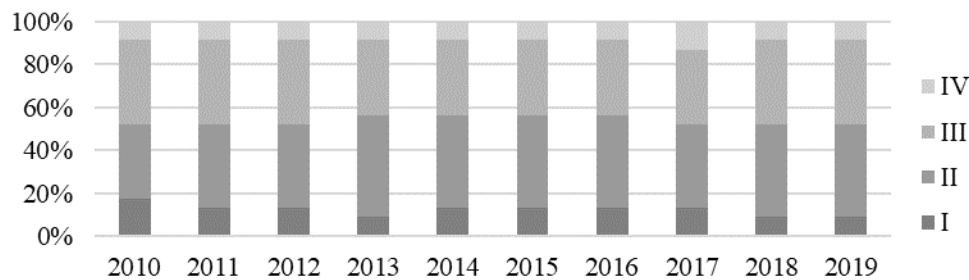
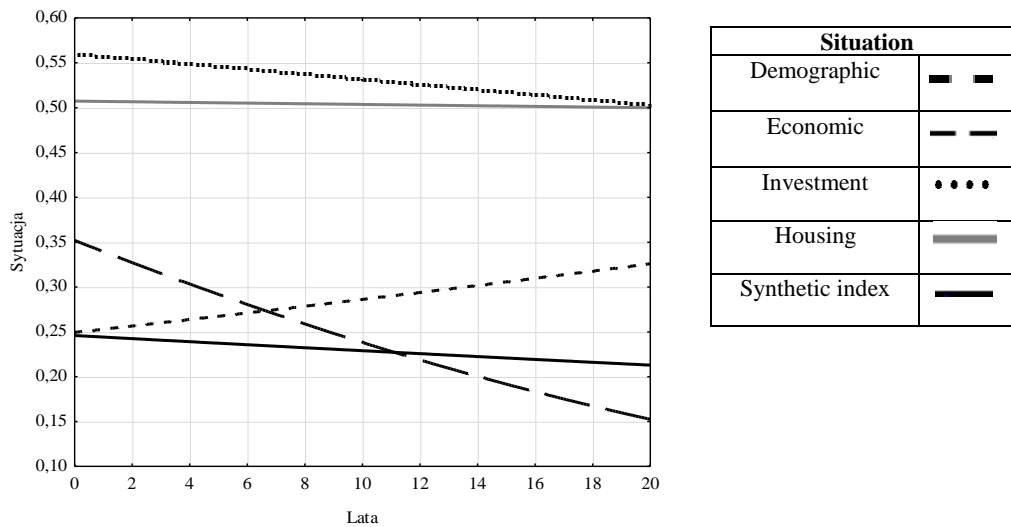


Fig. 5. The proportion of the units under analysis in individual classes in the years 2010-2019 with respect to the housing situation

Source: Prepared by the author based on research

The Pearson linear correlation index calculated for the whole period under study indicates a weak positive correlation between the synthetic index made up of the indices that characterise the demographic, economic and investment situation, and the housing situation as measured by the Pearson linear correlation index. It was 0.33 in 2019 ($p=0.05$). This means that the synthetic index has a small impact on the housing situation and vice versa.



*0-10: 2010-2019 period; 11-20: 2020-2029 period;

Fig. 6. The state (2010-2019) and prospects for change (2020-2029) regarding the demographic, economic, investment and housing situation in Cittaslow units

Source: Prepared by the author based on research

Only the demographic situation will improve within the next 10 years. The economic and investment situation will deteriorate, with the deterioration being forecast as deeper in the economic situation. Ultimately, the synthetic index will get lower. The housing situation will be stable (Fig. 6).

4. Conclusions

Small towns are an important element of the settlement network in Poland. Those which belong to the Cittaslow network play a special role. Nearly 75% of them are situated in the Warmińsko-Mazurskie Voivodeship. They play a role in local development, for example, as centres of service provision, where business activities – mainly of a local range – are concentrated, and multi-functional centres. The use of local development potential and improvement of life quality plays an important role in *slow city* development strategies. Quality of life is understood as good housing conditions, access to services, healthcare and education, care about the natural and cultural environment, increasing business activity and development while respecting the spatial order and principles of sustainable development.

The aim of the study was to identify the economic, investment and demographic factors (potentials) and their impact on the housing conditions. The study findings show that the situation in the units under study was the best in terms of the economic situation – it was good or medium in 60% of them. The demographic situation was medium or mediocre in 74% of the units. The investment situation was mediocre or bad in nearly 70% of them. The synthetic index level, which was highly variable in the units under study, was affected to the greatest extent by: demographic, economic and investment situation, in that order. Moreover, a weak positive correlation was observed between the synthetic index (made up of the indices which characterise the demographic, economic and investment situation) and the housing situation. It means that the impact of the synthetic index on the housing situation and vice versa is small. It partially corroborates the hypothesis. Since demography in the Cittaslow towns under study has a stronger impact on the general development potential than housing, the town authorities should focus on creating tools and solutions aimed at improving the demographic indices. Creating socioeconomic conditions to encourage people to stay where they live and creating a migration policy to

encourage return migration and to receive immigrants best suited to the local needs. It is particularly justified given the long-term forecasts, according to which there is going to be an improvement in the area. It would help to avoid threats arising from the deterioration of the economic and investment situation and, subsequently, the housing situation.

Significant changes are not forecast regarding the housing situation. However, it does not mean that nothing can be improved in this area. The index of 370 flats per 1,000 people in Poland is among the lowest in the EU countries. Shortage of flats for rent (including social flats) and their low availability, shown by a disadvantageous ratio of the price of 1 m² to wages, are further factors with an adverse impact on the housing situation in Poland. Moreover, the overpopulation index, used in assessments of the flat quality, shows that 38.5% of the society live in overpopulated flats (with the EU average of 17.1%). All of the indices considered regionally put the Warmińsko-Mazurskie Voivodeship in a worse position than the average in Poland (Napiórkowska-Baryła 2020). Probably, the situation in Cittaslow towns is similar. Therefore, it is an area in the social sphere which needs improvement. It is not possible without continuous dynamisation of the economic sphere and an increase in investment outlays, including in the public sphere. This will create an opportunity to achieve significant effects assumed in documents and strategies. The findings of a study conducted by Batyk & Woźniak (2019) show that the residents of towns in the Cittaslow network in the Warmińsko-Mazurskie Voivodeship do not see any considerable benefits for the time being. Therefore, the conclusion is that joining the Cittaslow network was a strictly promotional action, aimed at acquiring funds from Cittaslow projects and advertising the towns by participation in various international events.

References

- Alberti, M. (1997). Measuring Urban Sustainability. *Environment Impact Assessment Review*, 16 (4-6), 381-424.
- Andrews, F.M., & Inglehart, R.F. (1979). The structure of subjective well-being in nine western societies. *Social Indicators Research*, 6(1), 73-90. Retrieved from <http://hdl.handle.net/2027.42/43699>
- Bryx, M. (2001). *Financing of housing investments*. Warsaw: Poltext Publishing House.
- Cummins, R. (1996). The domains of life satisfaction. An attempt to order chaos. *Social Indicators Research*, 38, 303-328.
- Banachowicz, B. & Danielewicz, J. (2006). Co-governance as a factor of sustainable city development - the example of Łódź In J. Słodczyk & D. Rajchel (Eds.) *Sustainable development policy and city management instruments*. Opole: Publishing Office of University of Opole.
- Batyk, I., & Woźniak, M. (2019). Benefits of belonging to the Cittaslow Network in the opinion of residents of member cities. *Economic and Regional Studies*, 12(1), 56-67. <https://doi.org/10.2478/ers-2019-0006>
- Cesarski, M. (2013). *Housing policy in Poland in scientific works 1918-2010. Achievements and influence of the Polish school of research*. Warszawa: Warsaw School of Economics.
- Farelnik, E., & Stanowicka, A. (2016). Smart City, Slow City and Smart Slow City as Development Models of Modern Cities. *Olsztyn Economic Journal*, 11(4), 359-370. <https://doi.org/10.31648/oiej.2938>
- Farelnik, E., Stanowicka, A., & Wierzbicka, W. (2021). The effects of membership in the Polish National Cittaslow Network. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(1), 139-167. <https://doi.org/10.24136/eq.2021.005>
- Gawron, H. (2011). *Methods for evaluating the profitability of real estate investments*. Poznań: Publishing Office of the Poznań University of Economics and Business.
- Główka, G. (2012). *System of financing residential property in Poland*. Warsaw: Warsaw School of Economics.

- Grzegorek J., & Wierzbicki A. (2009). New Statistical Approaches in the Systemic Analysis of Regional, Intra-Regional and Cross-Regional Factors of Information Society and Economic Development; the Case of Mazovia. *Mazovian Regional Studies*, 3, 117-128.
- Herbst, I. (2013). In search of a housing policy In *Housing in the year of the family*. Building Congress and Habitat for Humanity. Warsaw.
- Janusz, M. (2020). The standard of living and its spatial differentiation among rural municipalities in Warmia-Masuria Province. *Acta Scientiarum Polonorum Administratio Locorum*, 19(4), 211-228. doi.org/10.31648/aspa.5687
- Kaczmarek, U. (2019). The concept of Slow City and its implementation in small cities of the metropolitan area. The Example of Murowana Goślina and Schneverdingen. *Regional Development and Regional Policy*, 48, 119-145 <https://doi.org/10.14746/rpr.2019.48.08>
- Klosa, S., & Widera K. (2017). Diversification of regions in terms of the level of innovation and entrepreneurship. *Regional Barometer*, 15(4): pp.77-83.
- Knox, P.L. (2005). Creating Ordinary Places: Slow Cities in a Fast World. *Journal of Urban Design*, 10(1).
- Korniłowicz, J. (2003). Housing situation of married couples in cities. Cracow; IRM Publishing Office.
- Korzeb, Z., & Niedziółka, P. (2020). Resistance of commercial banks to the crisis caused by the COVID-19 pandemic: the case of Poland. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 15(2), 205-234. <https://doi.org/10.24136/eq.2020.010>
- Kuc-Czarnecka, M. (2019). Sensitivity analysis as a tool to optimise Human Development Index. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(3), 425-440. <https://doi.org/10.24136/eq.2019.020>
- Lesińska, M., & Matuszczyk K. (2019). The activity of regional authorities facing migration processes in the context of demographic changes: The case of three Polish voivodships. *Regional and Local Studies*, 3(77), 64-82. <https://doi.org/10.7366/1509499.537704>
- Lis, P. (2011). Objectives and instruments of the social housing policy. In: J. Dzieciuchowicz (ed.) *Contemporary transformations of the housing environment - selected problems*. Łódź: Publishing Office of the University of Łódź.
- LIVE SLOW: a different side of modernity. Cittaslow Manifesto for the new humanism of being and living, retrieved from <https://www.cittaslow.org/> 20.12.2020.
- Local Data Bank. <https://bdl.stat.gov.pl/BDL/metadane>
- Mayer, H., & Knox, P.L. (2006). Slow Cities: Sustainable Places in a Fast World. *Journal of Urban Affairs*, 28(4)
- Napiórkowska-Baryła, A. (2020). Housing Resources in Poland – an Assessment Made in Terms of the Quality of Life. *Annales Universitatis Mariae Curie-Skłodowska, section H-Oeconomia*, 54(2), 67-76. <https://doi.org/10.17951/h.2020.54.2.67-76>
- Napiórkowska-Baryła, A., & Witkowska-Dąbrowska, M. (2018). Housing deprivation in Poland – a regional approach. *Baltic Geodetic Congress (BGC Geomatics)*. Olsztyn, 221-225. <https://doi.org/10.1109/BGC-Geomatics.2018.00048>
- Panek, T. (2009). *Statistical methods for multivariate comparative analysis*. Warsaw: Warsaw School of Economics.
- Peitgen, H.O., Jurgens, H., & Saute, D. (2002). *The limits of chaos. Fractals*. Warsaw: PWN Publishing House.
- Pieloch-Babiarz, A. (2020). Characteristics identifying the companies conducting different dividend policy: evidence from Poland. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 15(1), 63-85. <https://doi.org/10.24136/eq.2020.004>
- Piersiala, L. (2019). The usage pattern of development method to assess the functioning of special economic zones: the case of Poland. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(1), 167-181. <https://doi.org/10.24136/eq.2019.008>
- Przymeński, A., & Oliwa-Ciesielska, M. (2014). *Public housing assistance and the social demarginalisation of the poor*. Poznań: Publishing Office of the Poznań University of Economics and Business
- Radström, S. (2011). A Place-Sustaining Framework for Local Urban Identity: An Introduction and History of Cittaslow. *Italian Journal of Planning Practice*, 1(44), 90-113.

Sęk, H. (1993). Quality of life and health. *Legal Economic and Sociological Movement*, 2, 110–117.

Stec, M. (2011). Development conditions of voivodships in Poland - statistical and econometric analysis. *Social Inequalities and Economic Growth*, (20), pp. 232-251.

Szelągowska, A. (2011). *Financing of social housing*. Warsaw: CeDeWu Publishing Office.

Śleszyński, P. (2018). *Poland of medium-sized cities. Assumptions and concept of deglomeration in Poland*. Warsaw: Jagiellonian Club.

Świdwińska, N. 2017. Sustainable development of investment-attractive of warminko-mazurskie province. *Economics and Environment*, 3(62), 50-60. <https://doi.org/10.34659/2019/1/4>

The New Urban Agenda - Habitat III (2017). retrieved from: <https://habitat3.org/the-new-urban-agenda/> 20.12.2020.

Ulman P., & Wałęga A. (2012). The Housing Situation of Young Couples in Poland. *Social Inequalities and Economic Growth*, (25), 126-136. Rzeszow: Publishing Office of the University of Rzeszów. <https://doi.org/10.15584/nsawg>

Urbańska, W. (2008). Access to rental housing in European Union countries as a result of adopted housing policies. *Urban Development Issues* (2-3-4).

Wejnert, B. (2001). Problems of subjective and objective assessment of quality of life in American studies. In A. Wachowiak (ed.), *How to live? Selected problems of quality of life*. Poznan: Humaniora Foundation Publishing Office.

Wierzbicka, W. (2020). Socio-economic potential of cities belonging to the Polish National Cittaslow Network. *Oeconomia Copernicana*, 11(1), 203–224. <https://doi.org/10.24136/oc.2020.009>

Wilczek, T.M. (2014). Housing standard in Poland in comparison with neighbouring countries, members of the European Union. *Studies in Economics- Research Papers of the University of Economics*, (204), 195-209.

Wysocki, F. (2010). *Taxonomic methods in recognizing economic types of agriculture and rural areas*. Poznań: Publishing Office of Poznań University of Life Sciences.

Zadęcka, E. (2018). “Slow city” as a local development model. *Economic and Regional Studies*, 11(30), 84-106. <https://doi.org/10.2478/ers-2018-0027>

Zrałek, M. (2002). Residential environment of old people In: L. Frąckiewicz (ed.) *Poland and Europe. Demographic processes and the threshold of the XXI century. The processes of aging of the Polish population and its social consequences*. Katowice: Silesia Publishing Office.

Zubrzycka – Czarniecka, A. (2012). Urban policy against the aging of the city population - on the example of Poland, France and Canada. *Problems of Social Policy. Research and Debates*, 7(18)/2, 199-229.

Życiński, J. (2008). Prospects for the development of the rental housing market in Poland compared to foreign examples. *Urban Development Issues* (2-3-4).

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AN EMPIRICAL INVESTIGATION OF ADOPTION BIG DATA IN HIGHER EDUCATION SUSTAINABILITY

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Abstract. The present research aimed at developing a model on measuring education sustainability, incorporating the literature knowledge management sharing (KMS), innovation as well as adoption of big data (BD) within educational environment. This research hypothesizes that knowledge management sharing influences innovation adoption of BD besides sustainability for learning, while innovation influences adoption of BD besides sustainability in education. It is also hypothesized that BD adoption could be positively connected with education sustainability. The current study adopted a quantitative data gathering approach besides analysis approaches by surveying a total of 811 university undergraduates who were selected by stratified random selection. Learners' feedback was organized along with the four study constructs thus investigated to clarify their education sustainability. Accordingly, the data was analyzed quantitatively by means of Structure Equation Modelling (SEM). Findings demonstrated that knowledge management sharing positively influenced innovation, adoption of big data as sustainability for education. Results also indicate that innovation were negatively significant determinants of adoption of BD but was positively related to sustainability for education. Last, adoption of BD was positively associated to education sustainability. The BD adoption, innovation and knowledge management sharing successfully explained 79.2 % of education sustainability. Implications along with findings of this research were then provided.

Keywords: Adoption of Big Data; Knowledge Management Sharing, Sustainability for Education; Structure Equation Modelling (SEM)

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JEL Classifications: O32, O33

1. Introduction

Adoption of Big Data (BD) and Knowledge Management Sharing are regarded innovative technologies for learning in the context of education (Al-Rahmi et al., 2019). Recently, it became easy to produce knowledge and wisdom capable of supporting innovation, innovative services, smart decision making, and new business models from the raw data extracted from humans and machines. The present study investigates the challenges associated with sustainability in education by implementing BD, innovation and knowledge management sharing, and then

proposed a model capable to measure them. At present, both information and knowledge are highlighted as the source of power instead of land, finance, and capital (Ishikawa and Nakagawa, 2013). This point gives strength to this study which is conducted on BD. It was noticed the usage of BD is not fully utilized by organizations it's still gap (Al-Rahmi et al., 2019). This issue has received little attention from researchers and the reason for this low utilization is still vague (Olszak and Mach-Król, 2018). Thus, this research attempts to investigate the tools used to evaluate the tendency of organizations to utilize BD. How to manage BD and how knowledge management sharing is managed by organizations determine both sustainable competitive advantage and sustainable development (Ngai et al., 2017). The concept of multidisciplinary learning is used to define the group of students belong to different area of specializations or disciplines to come together with the objective of learning and sharing knowledge, while at the same time, applying the knowledge they have gained in real-life settings (Doukanari, Ktoridou, and Epaminonda, 2020). Reason for increasing significance of BD is due to its role in the digital evolution. Examining the different factors influencing the technology of BD adoption in universities is considered timely and critical, especially because the application of BD is still in its infancy. It was also reported that it is both crucial and timely to understand the influence of BD technology adoption, bearing in mind that more than three-quarters of organizations are reported to invest or plan to invest in BD (Gartner, 2016). It was also reported that BD and the various factors influencing its adoption have received little attention (Salleh and Janczewski, 2016; Chen et al., 2016). Therefore, this research proposes the designing such a model that would seek to address this research gap, which can be used by future researches to study the adoption of BD for sustainability in context to education. Ullah et al. (2020) and Ullah et al. (2021) An investigated the features that may influence the behavioral intention of energy experts to implement the distributed ledger technology for the energy management and smart learning environments, concluded that knowledge refers to the high degree of abstraction in the minds of the people. This assumes that knowledge is of a high level in terms of capturing data and information richness and comprehensiveness. Researchers have given knowledge management many definitions. The most significant aspect of knowledge management is knowledge sharing. In spite of the rapid growth in managing, analyzing, this study also looks at the factors behind the adoption of this technology in the different universities, which includes both knowledge management sharing factors and adoption factors. Any improvement in the area of knowledge sharing within any organization are the motivation that encourage the users to adopt such technology (Lam and Lambermont-Ford, 2010). It was found that previous research did not provide sufficient insights into the factors that might motivate knowledge sharing. It is recommended to provide learners with both training and knowledge concerning the problems relevant to sustainability. Such training that takes into consideration the teachers backgrounds and education is of a great importance and they also need to learn and to be trained on sustainability as they are expected to share it with their peers (Martins et al., 2006). Burmeister et al., (2013) highlighted that it is not an easy task for learners to learn about sustainability. Thus, there is a lack of models and framework that is providing examples on how it is to be big data used in organizations is needed (Olszak and Mach-Król, 2018; Kayser et al., 2018). Previous studies on BD mainly concentrate on technical characteristics (for example, technical algorithms and machine learning) as well as the system development (Kwon et al., 2015). Furthermore, in order to maximize the potential and value for the user from many channels, the design of creative learning with a big data approach must emphasize the importance of creating learning on an online basis. In this sense, retrieving huge volumes of data in order to deliver learning activities would provide a wide range of benefits that might lead to novel learning designs (Huda et al., 2017; Al-Rahmi et al., 2019). Despite the fact that some research has been done on the use of big data in creative teaching, there has been a lack of scholarly attention to explain the learning base of environment to aid in the provision of learning resources (Huda et al., 2017). In this study, four factors were investigated regarding the adoption of BD for education sustainability. Theoretically, several investigations have been performed in the intention of use and adoption of BD field. However, there is a shortage of research that explored the association between innovations, BD adoption and knowledge management sharing. Consequently, the current research aims to explore BD adoption for education sustainability, whereas no research was empirically performed which utilize such variables to enhance BD adoption successfully in education organizations by governments.

2. Theoretical Model and Hypotheses

A considerable number of competing and complementary models for studying adoption were produced by the research on Innovation adoption. This adoption refers to the adoption of information technology (IT) as well as information systems (IS). Thus, it can be found that most of the research done in the area of adoption used these works as theoretical frameworks. Innovations is considered to be an important concept in context to IT adoption and has been studied extensively by researchers (Puklavec et al., 2014). As a result, four variables influencing big data adoption as a sustainability for education were investigated in the current study: knowledge management sharing (KMS), innovations (IN), adoption of big data (ABD), and sustainability for education (SE), as shown in Figure 1.

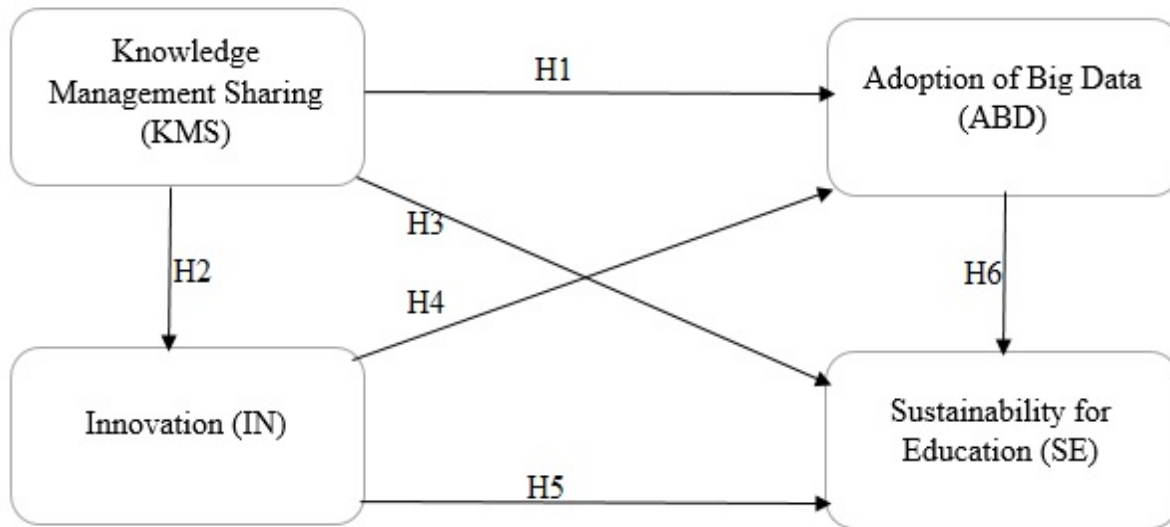


Figure 1. Research Model and Hypotheses

Source: Authors

2.1 Knowledge management sharing

Knowledge management is the process of an organization's knowledge and information being created, shared, used, and managed (Girard & Girard, 2015). Knowledge management is concerned with the process of translating individual knowledge into organizational knowledge, which is accomplished via sharing knowledge. Knowledge management relies heavily on knowledge sharing and the motivators that come with it (Oye et al., 2011). Thus, looking at these factors that motivate people in terms of knowledge sharing is very important for an understanding of knowledge sharing (Oye et al., 2011). A variety of terms and processes are related to knowledge management (KM). As reported by Cockrell and Stone (2010), KM includes essential terms such as acquirement of knowledge, knowledge exchange, and knowledge transference. Big data and knowledge management are critical components in sustaining and enhancing a variety of academic outcomes and procedures. As a result, big data and knowledge management are critical in any organization, and educational learning is no exception (Erickson & Rothberg, 2015). Therefore, this research uses the knowledge management sharing as a factor affect an innovation, big data adaptation and educational sustainability in higher education.

2.2 Innovations

'Innovation may thus be described as the process of having unique ideas and insights that have value, and then executing them such that they are accepted and utilized by substantial numbers of people,' says Rick Miller, President of Olin College of Engineering (2011, p. 2). Performing such innovations takes time as it is adjusted a number of times to suit the desired objective. It is simply a better product, practice, program, or process than the

original one. When such an innovation is adopted many times, it becomes the new trend. Many learning and teaching contexts are witnessing innovations which are built on standard practices by introducing new standards to be followed for the purpose of achieving a better result in terms of learning. Innovation is proven to be the main reason behind the success of USA (Zeihan, 2014). Individuals contribute their own knowledge in order to attain improved innovation levels as organizations do not have the capability of creating knowledge without individuals (Ordaz et al., 2011). As highlighted by Kamasak and Bulutlar in (2010), the researchers declared that when ideas and notions are shared amongst groups, the first group's ideas are perceived to be innovative and novel to other groups. Consequently, one group's ideas are viewed to be new to others and vice versa. The ability of students to adopt innovation as part of problem solving and critical analytical adoption, is affected with their ability to develop along with share knowledge, and that is well justified. This is because innovation comes from knowledge transference and exchange (Sáenz et al., 2009). Based on above studies, knowledge and knowledge sharing are indispensable to achieve high levels of innovation performance. The existing literature demonstrates that knowledge and innovation are directly related to one another. While knowledge is considered as a means to represent both technological innovations as well as process, new knowledge is the direct product of new innovation. Innovations can be of several categories and therefore, how organizations attain them is significantly dependent on knowledge sharing processes used by both individuals and groups. Consequently, both knowledge and knowledge distribution process may be indispensable to achieve high levels of innovation performance. Moreover Big data analytic process may be upgraded to help learners in discovering information effectively in line with their interests and requirements, in terms of technical competency in the method to manage the learning style built into the strategies and innovation (Huda et al., 2017). Furthermore, in terms of the extent to which the model reference of virtual learning approach is expected to contribute to expanding the extent of pedagogy and technology skill to support the initiative way of teaching and learning process in the higher education context, the model reference of virtual learning approach is expected to contribute to expanding the extent of pedagogy and technology skill to support the initiative way of teaching and learning process in the higher education context (Huda et al., 2017). Therefore, this research uses an innovation as a factor affect big data adaptation and educational sustainability in higher education.

2.3 Adoption of Big Data

Big data, as defined by Drigas and Leliopoulos (2014), is defined as the expansion of mobile networks, cloud computing, and enormous volumes of data, with a focus on bigger scaled datasets with high speed and diverse patterns that are beyond the control of traditional data management. Sigman et al. (2014) characterize it as having two characteristics: 1) huge amounts of data in a real-time stream; and 2) varied degrees of data structure, ranging from personal information to social networking resources. Bihl et al. (2016) focuses more on the distinctions from regular data, describing the concept as the accumulation of data beyond consumers' processing capacity, causing them to get overwhelmed. BD is characterized by having high-volume, excessive levels of variety and rate to involve certain technology as well as analytical techniques for their transformation into value (Mauro et al., 2016). Having a closer look at the issues that may impact the BD adoption by organizations is considered a great value, especially such organizations that are rapidly investing and investing in BD. Thus, BD use in higher education received scant attention and previous research in this domain has emphasized significantly on its development across various disciplines and key areas (Daniel, 2015). BD utilization in higher education has many advantages such as inspiring teachers' inquiry, discovering methods for defining improved education contexts and providing chances to scientifically examine educational activities (Mor et al., 2015). Avramides et al., (2015) also add that this utilization can result in enabling educators to reflect upon their education practice and its influence on the outcomes of learning. Studies pertaining to the implementation of BD within the educational sector have demonstrates its application through variety of techniques such as analytics, augmented reality (AR), virtual reality (VR), etc. (Butson and Daniel, 2017). According to Daniel (2015), in the field of the effective utilization of BD in education, both collaboration and access are considered major issues. Educational research can be developed through granting educational institutions with data accessibility and collaborative learning (Al-Rahmi et al., 2020; Alamri et al., 2020). Research heavily referred to these frameworks to investigate innovations,

including the adoption of BD by organizations (Nam et al., 2015; Agrawal, 2015; Sun et al., 2016). Salleh and Janczewski (2016) study have also presented a comprehensive analysis on BD security. This is because BD is considered to be one of the most significant innovations in terms of information technology (IT) (Nguyen, and Petersen, 2017). In connection with the adoption of BD, IT adoption in a variety of innovations has proven positively influenced by IT expertise (Nam et al., 2015). Big data allows for the creation of learning information about student performance and learning methods (Al-Rahmi et al., 2020; Al-Rahmi et al., 20219). Using big data, a variety of tools and assessments may be used to measure student behaviors and the efficacy of instructors' instruction in a learning environment where they engage with one another (Hwang, 2019). Big data may also help external stakeholders who are interested in the institutional efficacy in the competitive higher education market comprehend the intricate higher education system (Hwang, 2019). Big data has consequences for learning, evaluation, and research in higher education institutions, as well as a map of developing potentials in the form of various data sources and modes, such as conventional formats, brand new visualization tools, and the new value of interdisciplinary education (Cope and Kalantzis, 2016). In today's world, he has combined the form of data sources with the need for a self-regulating and long-term system to represent the resources' dependability and validity (Wassan, 2015). As a result, big data is used in this study as a factor affecting educational sustainability in higher education.

2.4 Sustainability for Education

Education is a tool to aid in the process of sustainable development, and education sustainability encompasses all types of educational concepts, actions, and processes that are appropriate for fostering individual and/or communal contributions to sustainable development (Hoffmann and Siege, 2018). Sustainability is defined as the process of adopting of new methodologies and modernizing of old educational system within the educational domain. It is based on values along with competitive principles as well as on a predatory view of the world. This term is considered far more complicated than sustainable development (Gadotti, 2010). The term sustainability means critical ecological cosmovision and is considered a major player in development that obtains harmony among humans, development along with the Earth understood as Gaia. Certain challenges might be posed when approaching sustainability in cultural diversity. Also, there is limited time allocated for other subjects such as sustainability since graduate and postgraduate courses are heavily loaded with mandatory subjects. In order to reach sustainable development, lifelong learning is considered essential due to the fact that learning these subjects through the different stages of education is important. Hands-on science experiments, demonstrations and participating in public debates are examples of sustainability concepts inserted in such curricula (Martins et al., 2006).

3. Research Methodology

Two specialists were referred for the questionnaire's content evaluation. Before proceeding to the data collection, a research permit was acquired from a public university for research purposes. For this research, the targeted population were undergraduate and postgraduate learners. A questionnaire had been designed for this research, which had been used to target the intended population. The researcher included both opened ended and closed ended questions to gain insights on educational sustainability, BD, KMS, and innovation. There were 24 questions (items) that were designed to collect background information from 811 respondents, see appendix. Thus, questionnaire elements pertaining to population by a 5-point Likert scale. Participants were responsible for responding to the questions related to educational sustainability, BD, innovation, and KMS. The data was analyzed using the most recent version of IBM's Social Sciences Statistical Package (SPSS). Structural Equation Modelling was also used to evaluate the data (SEM-Amos). Construct validity evaluation, convergent validity, and discriminant validity analysis were all conducted using the former. Finally, structural modeling (Hair, Sarstedt, Ringle, and Mena) was completed (2012).

3.1 Sample Characteristics and Data Collection

Only 856 of 940 hand-delivered surveys were returned, resulting in a 91.1 percent return rate. Following the discovery of 18 incomplete surveys, a total of 838 questionnaires were analyzed using the most recent SPSS version. This revealed another 27 surveys, 12 of which had missing data and 15 of which were outliers. As a result, the final sample size was 811 surveys. According to Hair et al. (2012), this method is critical for determining the right sample size since outliers can have a substantial impact on the accuracy of the results.

3.2 Measurement Instruments

The elements in the constructs were changed to meet the goal of guaranteeing content validity. The questionnaire was divided into two portions, as previously stated. The participants' demographic information was obtained in the first section. The second portion consisted of 24 items taken from Davis (1989) and Venkatesh and Bala (2008) measurements. As a result, the final and third part, which was built using IDT, had 18 items modified from research (Davis, 1989; Moore and Benbasat, 1991; Karahanna et al., 2002).

3.3 Data Analysis

The majority of the respondents were males, who made up 432 (53.3%) of the sample, whereas 379 (46.7%) of the sample comprised of females. The vast majority of the respondents 662 (81.6%) were in between the ages 21 to 24. 90 (11.1%) of the participants were between the ages 18 to 20. 45 (5.5%) of the participants belonged to 25 to 30, whereas the remaining 14 (1.7%) of the participants were above the age of 30. Based on the level of education, the vast majority of the participants were undergraduate study and made up 331 (48%) of the sample. 31.6% of the participants belonged to postgraduate master level, whereas the remaining 27.6% of the participants were PhD students. In terms of specialization, the majority of the participants belonged to science and technology and thus, made 50.4% of the sample. 35.3% of the participants were engineering students, and the remaining 14.3% of the participants were social science students.

4. Result Analysis

The Cronbach's Alpha reliability coefficient for the components in the research model that have an influence on knowledge management sharing, innovation, and BD adoption for education sustainability was 0.907. Three criteria were used in the discriminant validity examination. The index of the variables should not be more than 0.8. (Hair et al, 2021). The AVE value for each construct should not be less than 0.5. The AVE square for each concept should be greater than the factors inter construct correlations (IC) (Fornell and Larcker, 1998). The factor loadings in confirmatory factor analysis (CFA) should not be less than 0.7. Cronbach's alpha should never be less than 0.7. (Hair, Ringle, and Sarstedt, 2012). The composite reliability (CR) must also meet the same criteria, with a value of no less than 0.7.

4.1 Measurement Model Analysis

AMOS 23 was utilized to analyze the data in this investigation. Confirmatory factor analysis (CFA) and structural equation modeling (SEM) were also employed in this study. The researchers utilized reliability, discriminant validity, and convergent validity. The concept of unidimensionality was also employed. According to Hair et al. (2012), model approximation can be accomplished using techniques such as the chi-square/degree of freedom, fit index (CFI), comparative incremental fit index (IFI), normed chi-square, fit index (NFI), relative fit index (RFI), Tucker-Lewis coefficient (TLI), the parsimonious goodness of fit index (PGFI), the root mean square error of approximation (RMSEA), and the root mean-square error of app (RMR). The goodness-of-fit indices were used to evaluate the model for education sustainability over innovation, knowledge management sharing, and BD, as shown in Table 1. Figure 2 depicts a framework for educational sustainability based on knowledge management, innovation, and business development.

Table 1. Summary of Goodness Fit Indices for the Measurement Model.

Measures and accepted value	Results
Chi-square (χ^2): ≤ 3.5 to 0 & $p > .01$	1602.429/246
Normed Chi-square (χ^2): > 1.0 & < 5.0	6.514
Root-Mean Residual (RMR): Close to 0	.034
Normed Fit Index (NFI): ≥ 0.90	.967
Relative Fit Index (RFI): ≥ 0.90	.951
Incremental Fit Index (IFI): ≥ 0.90	.985
Tucker Lewis Index (TLI): ≥ 0.90	.971
Comparative Fit Index (CFI): ≥ 0.90	.985
Root-Mean Square Error of Approximation (RMSEA): for a good fit < 0.10 & for a very good fit < 0.05	.043

Source: Authors

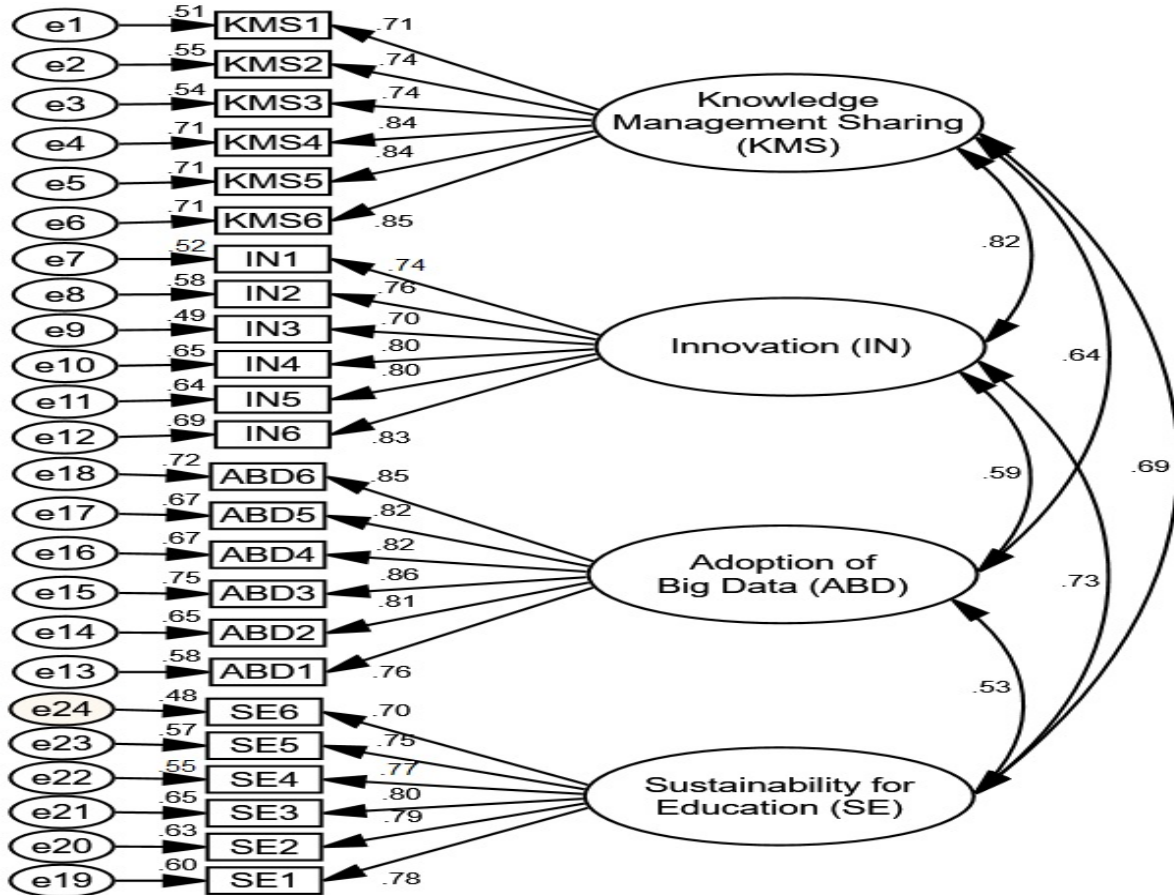


Figure 2. Measurement Model

Source: Authors

4.2 Measures Model Validity and Reliability

The size fluctuations among a concept and its values in combination with other concepts are determined using this form of validity (Bagozzi and Yi, 1998). Discriminant validity was found to be favorable across all concepts from this standpoint. This is due to the fact that the value was more than 0.5. (cut-off value). 0.001 was discovered to be the value of α . (Fornell and Larcker, 1981). Items' connections in any two supplied concepts must not be over the square root of the average variance shared by them in one construct, according to Hair et al., (2012). The

subsequent values of composite reliability (CR) and those of Cronbach's Alpha (CA) were found to be either equal or above the value of 0.7. The value of AVE was equal or above 0.5. This demonstrates that the factor loadings (FL) were found to have a significant relationship (Hair et al., 2012; Fornell and Larcker, 1981). The results of measurement model are further discussed in other sections of the study. The composite reliability (CR) results demonstrates that its values exceeded 0.7 and were from 0.887 to 0.932. The Cronbach's alpha (CA) value also exceeded 0.7 and was in the range of 0.891 to 0.941. The value of AVE was in the range of 0.597 to 0.651, which was above 0.5. All of these values were found to be greater than their required value. (Hair et al., 2012; Fornell and Larcker, 1981). See table 2 and 3.

Table 2. Validity and reliability for the Model

Factors	KMS	IN	ABD	SE	AVE	CR	CA
Knowledge Management Sharing (KMS)	0.911				0.651	0.915	0.941
Innovation (IN)	0.534	0.920			0.597	0.887	0.912
Adoption of Big Data (ABD)	0.423	0.514	0.899		0.611	0.919	0.927
Sustainability for Education (SE)	0.521	0.498	0.501	0.907	0.637	0.932	0.891

Source: Authors

Table 3. Factor loading

Factors	Items	Factor Loadings
Knowledge Management Sharing (KMS)	KMS1	0.71
	KMS2	0.74
	KMS3	0.74
	KMS4	0.84
	KMS5	0.84
	KMS6	0.85
Innovation (IN)	IN1	0.74
	IN2	0.76
	IN3	0.70
	IN4	0.80
	IN5	0.80
	IN6	0.83
Adoption of Big Data (ABD)	ABD1	0.85
	ABD2	0.82
	ABD3	0.82
	ABD4	0.86
	ABD5	0.81
	ABD6	0.76
Sustainability for Education (SE)	SE1	0.70
	SE2	0.75
	SE3	0.77
	SE4	0.80
	SE5	0.79
	SE6	0.78

Source: Authors

4.3 Structural Model Analysis

The path modelling analysis has been used in this research for modelling education sustainability in context to research model in relation of KMS, BD, and innovation. Referring to the model, the findings were compared and presented in the hypothesis testing discussion. This was followed by the second phase, the hypothesis identified were analyzed using CFA analysis on structural equation modelling (SEM) as illustrated in Figure 3.

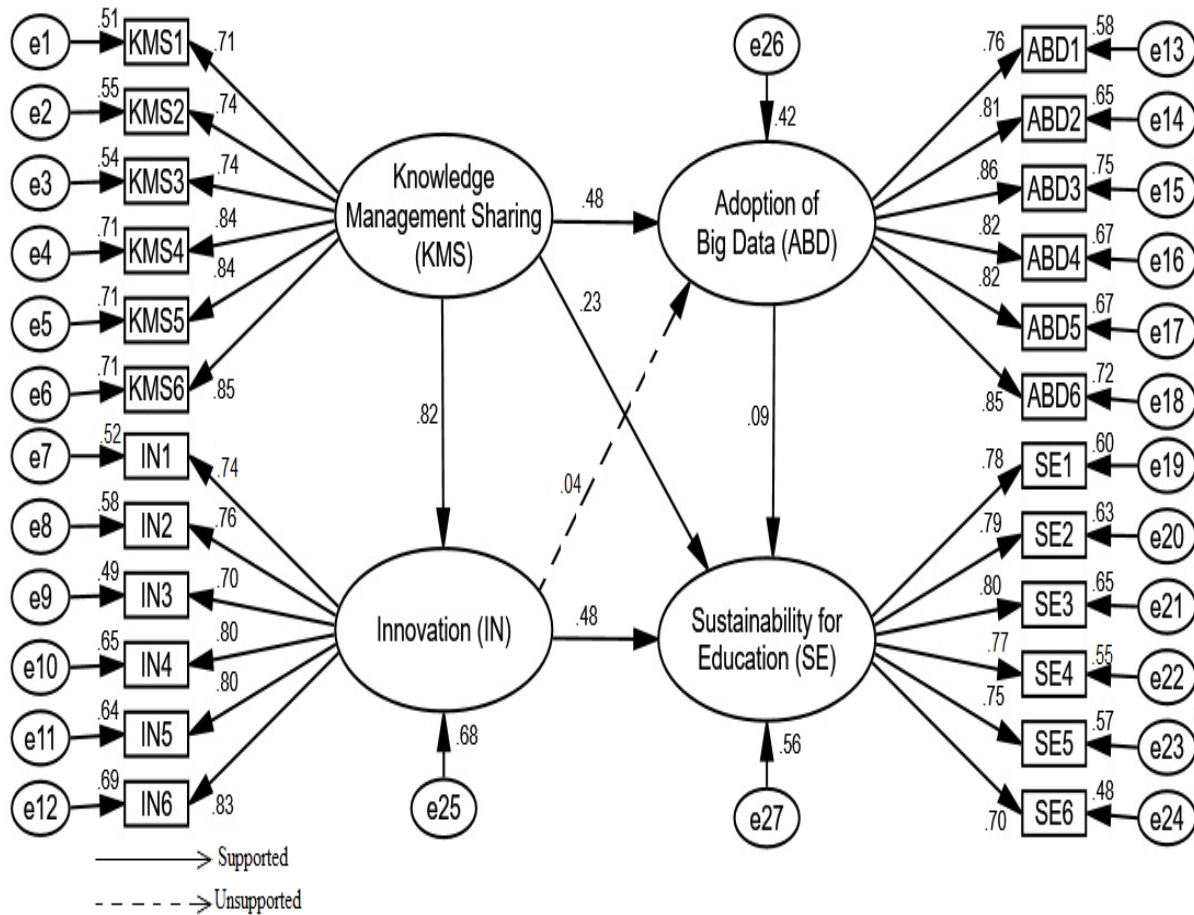


Figure 3. Results for the Proposed Path Model (Estimate)

Source: Authors

Figure 3 shows that five of the six hypotheses were proved, while one was rejected as a consequence of the data analysis. Table 4 shows the results of the model's statistical analysis.

Table 4. Hypothesis testing results of structural model

H	Independent	Relationship	Dependent	Estimate	S.E	C.R	P	Result
H1	KSM	→	ABD	.431	.066	6.551	.000	Supported
H2	KSM	→	IN	.818	.040	20.617	.000	Supported
H3	KSM	→	SE	.196	.059	3.311	.000	Supported
H4	IN	→	ABD	.029	.024	1.199	.279	Unsupported
H5	IN	→	SE	.410	.059	6.998	.000	Supported
H6	ABD	→	SE	.086	.039	2.198	.028	Supported

Source: Authors

The relationship between knowledge management sharing and BD adoption yielded the following data ($\beta=0.431$, $t=6.551$, $p<0.001$) for the first hypothesis. As a result, the first hypothesis has been established and is being tested. The connection between knowledge management sharing and creativity is positive ($\beta=0.818$, $t=20.617$, $p<0.001$),

according to the second hypothesis. Knowledge management sharing and educational sustainability show a positive connection ($\beta=0.196$, $t=3.311$, $p<0.001$). The third hypothesis is similarly favorable. The link between BD uptake and innovation is not supported ($\beta=0.029$, $t=1.199$, $p<0.001$). Hypothesis number four is rejected since it is negative. The fifth hypothesis demonstrates that there is a link between educational sustainability and creativity, indicating that the relationship is beneficial. Finally, data show that BD adoption is linked to education sustainability ($\beta=0.086$, $t=2.198$, $p<0.001$), implying that the sixth hypothesis is likewise confirmed and supported.

5. Implications and Discussion

The goal of this study was to take a fresh look at the BD model by combining it with knowledge management to see what factors influence its long-term viability and acceptance in education. This research was a more sophisticated attempt at incorporating knowledge management sharing into a business development adoption paradigm. The relationships between four innovative qualities, including invention, BD adoption, knowledge management sharing, and education sustainability, were identified using the methodology presented for this study. Despite the fact that we are witnessing the early stages of BD. At the present time, as reported in both research and media, many organizations around the world are making use of BD. In area of knowledge management sharing, BD is seen as a double-edged sword. The negative side is represented by the idea or assumption that such knowledge can make knowledge management sharing obsolete. On basis of phenomenological and human sociological aspects of knowledge, it has been instrumental in dealing with technological foregrounds as previously it was a fundamental challenge pertaining to knowledge management. Remaining as a dis-unified field has been identified as one of the major problem associated with knowledge management. BD is expected to bring such unity. BD and knowledge management are seen as two important fields that can have mutual lessons and collaboration opening the door wide for future research. Innovation is considered to be the process of creating, adopting, and implementing novel ideals, programs, products, services, or policies within the organization (Kamasak and Bulutlar, 2010). The statistical analysis results related to the Table 4, shows that all hypothesis have been proven with the exception of one hypothesis (H4), the association among innovations and adoption of BD use. It demonstrates that innovations and adoption of BD have a negative relationship. This is in contrast to the earlier research (Nguyen and Petersen, 2017; Nam et al., 2015; Mor et al., 2015). This research has demonstrated that KMS and innovation, adoption of BD use and education sustainability have a positive relationship. Results also revealed that innovation positively influence sustainability of education, but innovation negatively impact adoption of BD use, which in turn influence adoption and sustainability for education purposes. The findings also have supported that innovations and knowledge management sharing in context to BD for education sustainability. The findings of this research is compatible with previous researches that have been conducted in this domain. They have verified that knowledge management sharing had significant positive effects on innovations, adoption of BD use and sustainability of education (Oye et al., 2011; Gartner, 2016; Butson and Daniel, 2017; Nguyen, and Petersen, 2017). On the other hand, it was observed that innovation had no significant negative effects on adoption of BD, but had significant positive effects on sustainability of education (Zeiha, 2014; Daniel, 2015). The various sources of knowledge in an organization can be controlled by knowledge management by being captured, identified and processed (Rajpathak and Narsingpurkar, 2013). There is a huge amount of valuable structured and untraditional data beyond the transactional ones used by organizations. Data that is available can be processed and structured to gain important information, which can be used by organizations to aid their decision-making process, enhance their efficiency, and increase their profitability (Rajpathak and Narsingpurkar, 2013). Many social tools such as Twitter, Facebook, Google+ accounts and Linked-in are available in the hands of young people who use them in their everyday life. Young people also use different tools of social media or websites for certain purpose such as uploading photographs through the use of Flickr, having opinion mining or sentiment analysis through semantia.com or crowd sourcing through the use of Amazon.com. All the above-mentioned activities are all examples of BD use. In recent times, information over the internet is available abundantly. Furthermore, several data sources are available for smart

and intelligent devices such as sensors, smart devices, RFIDs, social media networks, medical records, and cameras. On the other hand, both the web as well as the web-based social networking (BD) have significantly increased in speed and simplicity, therefore, social networking platforms likewise permit information sharing among the public, collaborative learning, and engagement, (Alalwan et al., 2019). Faculty must determine BD use in addition to offering instructional materials that would improve technology learning among the students. Furthermore, findings suggest that faculty must explain how technology assists students, in addition to how it benefits them regarding BD study in order to achieve other learning goals. Learners who perceived that the knowledge management sharing and innovations would benefit them acquire BD adoption for education sustainability. Similarly, this study requires three practical pieces of evidence. First, knowledge management sharing effects innovation empirical evidence, adoption of BD use and sustainability of education. Second, empirical evidence of innovation effects BD and technologies adoption uses and sustainability of education. The third empirical evidence of adoption of BD use can directly affect sustainability of education. Substantia contribution has been made based on research model in context to educational learning (Al-Rahmi et al., 20201a; Al-Rahmi et al., 20201b; Sayaf et al., 2021). Based on the findings of this research, the following research implications have been identified:

- To adopt BD for learning, supervisors and lecturers can assist the learners through responding to the questions/queries of learners and support for knowledge sharing, which will enhance learners learning concerns in addition to improve researcher's skill in relation to research.
- Institution of higher education are encouraged to enroll learners to be familiar with the use of BD in regard to learning courses based on their own desires rather than forcing them to do so.
- Resources and Technology both are significant issues of interest in learners ' attitude regarding BD use and behavioral intent to BD adoption use for education sustainability.

No research is conducted without certain limitations. For example, the study sample size in this study was restricted to one university. Consequently, findings might not be able to disclose the performance of private universities, militaries, or school educators. Another drawback of this study is that it relies solely on questionnaires. Because the study lacked qualitative data, it was based on students' impressions, which may differ from instructors' perceptions. Furthermore, the study did not look at differences between academic disciplines. It is advised that future studies be duplicated in other states.

5.1 Conclusion and Future Work

The impact of KMS on BD adoption and innovation has been studied in this research and, which is out to be positively correlated to education sustainability, has been proven and supported in the current study. The findings also showed that innovation influences education sustainability. Research model use in examining knowledge management sharing, innovations and adoption of big data for education sustainability was additionally endorsed by the findings. Consequently, this study makes significant contribution to existing literature pertaining to KMS, innovation and adoption of big use for education sustainability. Considering the significance that learners intend to use BD for education sustainability, further future research must take into consideration constructing guidelines for instructors in relation to BD based learning other disciplines and areas. Future research should also consider the role of educators and other stakeholders in context to BD based learning environments. While this research indicates that learners might be rather positive with it, facilitators and constraints must be explored. Comparisons of this study with studies conducted in other countries with reference to this research can also enhance the outcomes of the study as it can offer a wide perspective on the area under investigation.

References

- Agrawal, K.P. (2015). Investigating the Determinants of Big Data analytics (BDA) Adoption in Asian Emerging Economies, Patna: Chandragupt Institute of Management. <https://doi.org/10.5465/ambpp.2015.11290abstract>
- Alalwan, N., Al-Rahmi, W. M., Alfarraj, O., Alzahrani, A., Yahaya, N., & Al-Rahmi, A. M. (2019). Integrated Three Theories to Develop a Model of Factors Affecting Students' Academic Performance in Higher Education. IEEE Access, 7, 98725-98742. <https://doi.org/10.1109/access.2019.2928142>
- Alamri, M. M., Almaiah, M. A., & Al-Rahmi, W. M. (2020). The role of compatibility and task-technology fit (TTF): On social networking applications (SNAs) usage as sustainability in higher education. IEEE Access, 8, 161668-161681. <https://doi.org/10.1109/access.2020.3021944>
- Al-Rahmi, A. M., Al-Rahmi, W. M., Alturki, U., Aldraiweesh, A., Almutairy, S., & Al-Adwan, A. S. (2021a). Exploring the Factors Affecting Mobile Learning for Sustainability in Higher Education. Sustainability, 13(14), 7893. <https://doi.org/10.3390/su13147893>
- Al-Rahmi, A. M., Shamsuddin, A., Alturki, U., Aldraiweesh, A., Yusof, F. M., Al-Rahmi, W. M., & Aljeraiwi, A. A. (2021b). The Influence of Information System Success and Technology Acceptance Model on Social Media Factors in Education. Sustainability, 13(14), 7770. <https://doi.org/10.3390/su13147770>
- Al-Rahmi, W. M., Alzahrani, A. I., Yahaya, N., Alalwan, N., & Kamin, Y. B. (2020). Digital communication: Information and communication technology (ICT) usage for education sustainability. Sustainability, 12(12), 5052. <https://doi.org/10.3390/su12125052>
- Al-Rahmi, W. M., Yahaya, N., Aldraiweesh, A. A., Alturki, U., Alamri, M. M., Saud, M. S. B., ... & Alhamed, O. A. (2019). Big data adoption and knowledge management sharing: An empirical investigation on their adoption and sustainability as a purpose of education. IEEE Access, 7, 47245-47258. <https://doi.org/10.1109/access.2019.2906668>
- Avramides, K., Hunter, J., Oliver, M., & Luckin, R. (2015). A method for teacher inquiry in cross curricular projects: Lessons from a case study. British Journal of Educational Technology, 46(2), 249–264. <https://doi.org/10.1111/bjet.12233>
- Bagozzi, R.P., Yi, Y., & Nassen, K.D. (1988). Representation of measurement error in marketing variables: Review of approaches and extension to three-facet designs. Journal of Econometrics, 89(1–2), 393–421. [https://doi.org/10.1016/s0304-4076\(98\)00068-2](https://doi.org/10.1016/s0304-4076(98)00068-2)
- Bihl, T. J., Young II, W. A., & Weckman, G. R. (2016). Defining, understanding, and addressing big data. International Journal of Business Analytics (IJBAN), 3(2), 1-32. <https://doi.org/10.4018/978-1-5225-7501-6.ch004>
- Burmeister, M., Schmidt-Jacob, S., and Eilk, I. (2013). German chemistry teachers' understanding of sustainability and education for sustainable development an interview case study. Chem. Educ. Res. Pract. 14, 169–176. <https://doi.org/10.1039/c2rp20137b>
- Butson, R.J., & Daniel, B.K. (2017). The Rise of Big Data and Analytics in Higher Education. In The Analytics Process (pp. 127–140). Auerbach Publications, 2017. <https://doi.org/10.1201/9781315161501-5>
- Chen, Y., Chen, H., Gorkhali, A., Lu, Y., Ma, Y., & Li, L. (2016). Big data analytics and big data science: a survey. Journal of Management Analytics, 3(1), 1–42. <https://doi.org/10.1080/23270012.2016.1141332>
- Cockrell, R.C., & Stone, D.N. (2010). Industry culture influences pseudo-knowledge sharing: a multiple mediation analysis. Journal of Knowledge Management, 14 (6), 841–857. <https://doi.org/10.1108/13673271011084899>
- Cope, B., & Kalantzis, M. (2016). Big data comes to school: Implications for learning, assessment, and research. Aera Open, 2(2), 2332858416641907. <https://doi.org/10.1177/2332858416641907>
- Daniel, B. (2015). Big Data and analytics in higher education: Opportunities and challenges. British journal of educational technology, 46(5), 904–920. <https://doi.org/10.1111/bjet.12230>
- Davis, F.D. (1993). User Acceptance of information technology: system characteristics, user perceptions and behavioural impacts. International Journal of Man-Machine Studies, 38, 475– 487. <https://doi.org/10.1006/imms.1993.1022>
- Doukanari E., Ktoridou D., & Epaminonda E. (2020). Multidisciplinary and Multicultural Knowledge Transfer and Sharing in Higher Education Teamworking. In IEEE Xplore proceedings of EDUCON 2020 – IEEE Global Engineering Education Conference "Engineering

Education Through Student Engagement", Porto, Portugal, April 27-30, 2020. pp. 1836-1843. <https://doi.org/10.1109/educon45650.2020.9125401>

Drigas, A. S., & Leliopoulos, P. (2014). The use of big data in education. *International Journal of Computer Science Issues (IJCSI)*, 11(5), 58. <https://www.ijcsi.org/papers/IJCSI-11-5-1-58-63.pdf>

Erickson, S., & Rothberg, H. (2015). Big data and knowledge management: establishing a conceptual foundation. *Leading Issues in Knowledge Management*, 2, 204. https://books.google.com.sa/books?hl=en&lr=&id=SCdsCwAAQBAJ&oi=fnd&pg=PA204&dq=Big+data+and+knowledge+management:+establishing+a+conceptual+foundation&ots=WQHPMpiDHL&sig=8iGDG-ReGrZtEOSEnrly29Irf4&redir_esc=y#v=onepage&q=Big%20data%20and%20knowledge%20management%3A%20establishing%20a%20conceptual%20foundation&f=false

Fornell, C., & Larcker, D.F. (1998). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 39–50. <https://journals.sagepub.com/doi/10.1177/002224378101800104>

Gadotti, M. (2010). Reorienting education practices towards sustainability. *Journal of Education for Sustainable Development*, 4(2). 203-211. <https://journals.sagepub.com/doi/abs/10.1177/097340821000400207?journalCode=jsda>

Gartner, A. (2016). Gartner Survey Shows More Than 75 Percent of Companies Are Investing or Planning to Invest in Big Data in the Next Two Years [Online] Available at: <http://www.gartner.com/newsroom/id/3130817>

Girard, J.P., & Girard, J.L. (2015). Defining knowledge management: Toward an applied compendium, *Online Journal of Applied Knowledge Management*. 3(1), 1-20. https://www.iiakm.org/ojakm/articles/2015/volume3_1/OJAKM_Volume3_1pp1-20.pdf

Hair, J.F., Sarstedt, M., Ringle, C.M., & Mena, J.A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, 40(3), 414–433. <https://link.springer.com/article/10.1007/s11747-011-0261-6>

Hoffmann, T., & Siege, H. (2018). What is Education for Sustainable Development (ESD). *Human Development*, 1(8), 1-6. https://esd-expert.net/files/ESD-Expert/pdf/Was_wir_tun/Lehr-%20und%20Lernmaterialien/What_is_Education_for_Sustainable_Development.pdf

Huda, M., Haron, Z., Ripin, M. N., Hehsan, A., & Yaacob, A. B. C. (2017). Exploring innovative learning environment (ILE): big data era. *International Journal of Applied Engineering Research*, 12(17), 6678-6685. https://www.ripublication.com/ijaer17/ijaerv12n17_53.pdf

Hwang, Y. (2019). Adoption of Big Data in Higher Education for Better Institutional Effectiveness. *American Journal of Creative Education*, 2(1), 31-44. <https://doi.org/10.20448/815.21.31.44>

Ishikawa, A., & Nakagawa, J. (2013). *An Introduction to Knowledge Information Strategy. From Business Intelligence to Knowledge Sciences*; World Scientific: London, UK, ISBN 978–981–4324–42–7, 2013. <https://doi.org/10.1142/7924>

Karahanna, E., Evaristo, J., & Srite, M. (2002). Methodological Issues in MIS Cross-Cultural Research. *Journal of Global Information Management*, 10(1), 48–55. <https://doi.org/10.4018/978-1-59140-144-5.ch011>

Kayser, V., Nehrke, B., & Zubovic, D. (2018). Data Science as an Innovation Challenge: From Big Data to Value Proposition. *Technology Innovation Management Review*, 8(3). <https://doi.org/10.22215/timreview/1143>

Kwon, T.H., Kwak, J.H., & Kim, K. (2015). A study on the establishment of policies for the activation of a big data industry and prioritization of policies: Lessons from Korea. *Technological Forecasting and Social Change*, 96, 144–152. <https://doi.org/10.1016/j.techfore.2015.03.017>

Lam, A., and Lambermont-Ford, J.P. (2010). Knowledge sharing in organizational contexts: A motivation-based perspective. *Journal of Knowledge Management*, 14(1), 51–56. <https://doi.org/10.1108/13673271011015561>

Martins, A.A., Mata, T.M., & Costa, C.A. (2006). Education for sustainability: challenges and trends. *Clean Technologies and Environmental Policy*, 8(1), 31–37. <https://doi.org/10.1007/s10098-005-0026-3>

Mauro, A.D., Greco, M., & Grimaldi, M. (2016). A formal definition of Big Data based on its essential features. *Library Review*, 65(3), 122–135. <https://doi.org/10.1108/lr-06-2015-0061>

- Miller, R. K. (2011, May). How do you recognize and cultivate potential innovator?. Paper presented at Olin College. Retrieved from https://www.olin.edu/sites/default/files/how_do_you_recognize_and_cultivate_potential_innovators_-_may_2011.pdf
- Moore, G.C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192–222. <https://doi.org/10.1287/isre.2.3.192>
- Mor, Y., Ferguson, R., & Wasson, B. (2015). Learning design, teacher inquiry into student learning and learning analytics: A call for action. *British Journal of Educational Technology*, 46(2), 221–229. <https://doi.org/10.1111/bjet.12273>
- Nam, D., Kang, D., & Kim S. (2015). Process of big data analysis adoption: Defining big data as a new IS innovation and examining factors affecting the process. Hawaii, Hawaii International Conference on Systems Sciences, 2015. <https://doi.org/10.1109/hicss.2015.569>
- Ngai, E.W., Gunasekaran, A., Wamba, S.F., Akter, S., & Dubey, R. (2017). Big data analytics in electronic markets. *Electron. Mark.* 27, 243–245. <https://doi.org/10.1007/s12525-017-0261-6>
- Nguyen, T., & Petersen, T.E. (2017). Technology adoption in Norway: organizational assimilation of big data. (Master's thesis). <https://openaccess.nhh.no/nhh-xmlui/handle/11250/2455449>
- Olszak, C. & Mach-Król, M. (2018). A Conceptual Framework for Assessing an Organization's Readiness to Adopt Big Data. *Sustainability*, 10(10), 3734. <https://doi.org/10.3390/su10103734>
- Oye, N.D., Salleh, M., & Iaha, N.A. Knowledge sharing in workplace: Motivators and demotivators. *International Journal of Managing Information Technology*, 3(4), 71–84, 2011. <https://doi.org/10.5121/ijmit.2011.3406>
- Puklavec, B., Oliveira, T., & Popović, A. (2014). Unpacking business intelligence systems adoption determinants: An exploratory study of small and medium enterprises. *Economic and Business Review*, 16(2), 185–23. <https://doi.org/10.15458/2335-4216.1278>
- Rajpathak, T., and Narsingpurkar, A. (2013). Knowledge from big data analytics in product development. TCS white paper. <https://www.semanticscholar.org/paper/Managing-Knowledge-from-Big-Data-Analytics-in-Rajpathak/fc95a536777c5bc54cef8399fb93a10803fb94e2>
- Sáenz, J., Aramburu, N., & Rivera, O. (2009). Knowledge sharing and innovation performance: A comparison between high-tech and low-tech companies. *Journal of Intellectual Capital*, 10(1), 22–36. <https://doi.org/10.1108/14691930910922879>
- Salleh, K., & Janczewski, L. (2016). Technological, organizational and environmental security and privacy issues of big data: A literature review. *Procedia Computer Science*, 100, 19–28. <https://doi.org/10.1016/j.procs.2016.09.119>
- Sayaf, A. M., Alamri, M. M., Alqahtani, M. A., & Al-Rahmi, W. M. (2021). Information and Communications Technology Used in Higher Education: An Empirical Study on Digital Learning as Sustainability. *Sustainability*, 13(13), 7074. <https://doi.org/10.3390/su13137074>
- Sigman, B. P., Garr, W., Pongsajapan, R., Selvanadin, M., Bolling, K., & Marsh, G. (2014). Teaching big data: Experiences, lessons learned, and future directions. *Decision Line*, 45(1), 10–15. <http://statlit.org/pdf/2014-Sigman-Teaching-Big-Data-DSI.pdf>
- Sun, S., Cegielski, C.G., Jia, L., & Hall, D.J. (2016). Understanding the Factors Affecting the Organizational Adoption of Big Data. *Journal of Computer Information Systems*, 1–11. <https://doi.org/10.1080/08874417.2016.1222891>
- Ullah, N., Alnumay, W. S., Al-Rahmi, W. M., Alzahrani, A. I., & Al-Samarraie, H. (2020). Modeling cost saving and innovativeness for blockchain technology adoption by energy management. *Energies*, 13(18), 4783. <https://doi.org/10.3390/en13184783>
- Ullah, N., Mugahed Al-Rahmi, W., Alzahrani, A. I., Alfarraj, O., & Alblehai, F. M. (2021). Blockchain Technology Adoption in Smart Learning Environments. *Sustainability*, 13(4), 1801. <https://doi.org/10.3390/su13041801>
- Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a research agenda on interventions. *Journal of Decision Sciences*, 39, 2, pp. 273–315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- Wassan, J. T. (2015). Discovering big data modelling for educational world. *Procedia-Social and Behavioral Sciences*, 176, 642–649. <https://doi.org/10.1016/j.sbspro.2015.01.522>
- Zeihan, P. (2014). *The Accidental Superpower: The Next Generation of American Preeminence and the Coming Global Disorder*, Twelve Hachette Book Group, New York, NY. <https://www.amazon.com/Accidental-Superpower-Generation-American-Preeminence/dp/1455583685>

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IDENTIFICATION OF CORRUPTION RISKS IN THE BANKING SECTOR OF THE ECONOMY

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Abstract. Unfortunately, nowadays corruption is one of the main problems of developing countries. High level of corruption offences badly hits the prestige of the country and reduces the level of trust in government. One of the hardest spheres in terms of combating corruption is the banking sector, because the banking system collides with the most complicated forms of corruption. It is the fact that banking assets in monetary terms are close to the country's GDP, which potentially makes the banking sector attractive to corrupt officials. In this regard, the study of the specifics of the occurrence of corruption risks in the banking sector, as well as strategies and approaches to their elimination, requires thorough checks in all its areas of activity. Drawing up an effective strategy will significantly minimize the risks of corruption and achieve more transparent and efficient banking sector, which in the future, of course, will affect the quality of the services provided by the bank. Therefore, the strategy of building an effective banking sector should be a priority for developing countries, because these countries more often face with corruption risks.

Keywords: corruption; banking; corruption risks; banks and banking activities; economic security; national economy

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JEL Classifications: E42, E52, G38

1. Introduction

Banking sector undoubtedly is an essential sphere of social life in any economy. That aside from economic and social development influences international market competitiveness, state-of-the-art in business sector and other macroeconomic indices. At the same time, modern Post-COVID banking sector is exposed to a risk of illegal actions concerning corrupt practices. One of the fundamental causes of it is the aspect of banking sector on the one hand being sufficiently independent from the other spheres of economy and on the other hand being obliged

to pursue objectives and rationale of the state (Cohen, 2000). As a result, banks may have means for discreditable practices at financial, stock and other markets. Furthermore, due to extensive and multi-faceted structure of banking sector, investigation of corruption-related offences and identification of their risks primarily for the state economy are very perplexed (Montes, 2021). The dynamic nature of banking system is another substantial aspect (Herteliu, 2021). Digitalization including an introduction of electronic funds created new money laundry loopholes for banks and added complexity for Central Banks and enforcement authorities to detect and early eliminate such violations. In this regard, the topic of our research is development of strategy and approaches to eliminate corrupt practices and subsequent risks for banking institutions by learning them.

2. Literature review

Both legislative and economic grounds are most commonly pointed out under the research of corrupt practices in banking sector. Corruption is more likely to develop during macroeconomic crisis periods in economies. For instance, Cooray (2018) in his research writes that though Argentina has a great supply of natural resources and oil deposits, it is not enough to issue laws configured to regulate matters concerning corrupt practices that undermine banking sector, considering Barrell (2000), the redeployment of resources between stakeholders leads to the decrease of efficiency in this sector of economy. Studying the banking sector of Bangladesh economists drew a similar conclusion uncovering a general trend in existing banking corporate management structure (Yap, 2020; Palamarchuk et al., 2019). Concurrently Reaz and Arun (2006) spotted information nondisclosure by independent auditors checking banking institutions activities, under political duress of various factions. Legislation in its turn is usually able to have an effect on the level of corruption interference in banking sector (Fischer, 2015; McCorkle, 2020).

However, individual economist in praxis take notice of too vague contents of corresponding legal acts. For example, Rissy (2021) set eyes on a related party's determination that does not define legal related parties in Indonesian banking sector properly, because there are no provisions containing full volume of rights and obligations of the parties, neither for bank party, nor for another parties. Muhammad-Sanusi (2015) research towards Malaysian bank managers in another valuable case disclosing the most frequent frauds occurring in bank departments to be loan and mortgage frauds. So far, the main target to decrease corrupt practices in this country is not a development of corporate management strategies, but a financial risk management, that allows influencing the legal aspects of fraudulent transactions timely (Labonte, 2018). We must admit that corruption element in banking institutions does not depend on the individual country's level of economic development.

According to Bermpei and Kalyvas (2020) research of US banking activities at the state level, public corrupt practices have the greatest demolishing impact on the mortgage market, which directly affects budgets of local governments. In this regard, Pasiouras (2006) research of bank regulation and law enforcement in 857 banks in 71 countries regarding to global activity index is significantly important. Because banks of developed economies are awarded with grater indexes, the results were corrected with adding variable indicators concerning practices of bank regulation and law enforcement. In our opinion, this illustrates positive correlation between the performance of an audit in banking sector and the regulatory policy of individual country.

2. Methodology

The corruption component in the banking sector is generated not only by the moral qualities of employees, but also by disadvantages in the organizational and regulatory systems. In this regard, in order to reduce corruption risks, an important aspect is elaboration of the regulatory framework governing the activities of the business sector of the economy. Therefore, in the banking sector, where significant flows of information circulate, special legal regulation is required. In this case, a clear legal regime for its application is established. At the same time, when studying the existing normative acts that establish the legal regimes of a particular type of information and

analyzing them, the legislative bodies do not pay sufficient attention to the issues. They related to the elaboration of the provisions that formalize the legal regime of information. Sometimes, limiting to indicating that information is classified as a certain type of secret or its confidential category.

At the same time, the meaning of the legal regime of any object of law, including information, is to introduce and ensure effective regulation of public relations, which connected to this object, and to establish the most optimal process for the implementation of their interests by legal entities. In this regard, the purpose of the legal regime is to create obstacles to illegal corrupt activities in the banking sector (Akhmadullina, 2014; Bakharev et al., 2020).

One of the gaps in the regulation of the banking sector is that employees in the department of banking supervision are not actually responsible for violations, which are not detected during the audit. It can lead to the bankruptcy of the bank itself. In this case, it is necessary to make certain changes, for example, to the current legislation on the central bank, on the basis of which it is possible to oblige compliance with certain regulations, taking into account the establishment of specific types of financial liability for improper verification.

The state's activities are more associated with the risks of inefficiency and high sensitivity of the banking sector to changes in external conditions. It has a reflection in the fact that public resources are allocated not in favor of the most efficient banks, but in favor of structures that need to maintain financial stability (Javaria et al., 2020; Poghosyan, 2018). At the same time, an increase in the share of state influence in the financial sector leads to the formation of increased conditional obligations of the budget and the central bank to support the banking sector, which is realized in times of economic instability in significant amounts of actual assistance. In particular, for the Russian banking sector in recent periods has been two unfavorable trends that can lead to risks of corruption:

- oligopolization of the banking sector;
- nationalization of the banking sector.

According to the statistics of the Bank of Russia on the degree of concentration of bank assets, the dynamics of this sector for the period 2017-2020 is presented in Table 1.

Table 1. Concentration of assets by banking sector

Distribution of credit institutions ranked by assets (descending order)	01.01.2017		01.01.2018		01.01.2019		01.01.2020		01.01.2021	
	USD million	In % of total	USD million	In % of total	USD million	In % of total	USD million	In % of total	USD million	In % of total
First 5	755,6	55,3	756,6	55,8	879,9	60,4	776,3	61,3	758,3	61,4
From 6 to 20	312,4	22,8	318,6	23,5	308,3	21,2	262	20,6	259,5	21,1
From 21 to 50	144,9	10,6	145	10,8	142,5	9,8	122	9,6	115	9,3
From 51 to 200	128,8	9,4	113,1	8,4	110	7,6	95,6	7,5	89,6	7,3
Total	1341,7	100	1333,3	100	1440,7	100	1255,9	100	1222,4	100

Based on the analysis, it should be noted that the first five largest banks control more than 60% of the total banking assets of the country. This situation indicates the oligopoly of the banking sector and it is extremely dangerous for several reasons. Firstly, it leads to further oligopolization of the banking sector, increased risks of cartel collusion, and the elimination of competitors from the market, as well as a decrease in the quality of services for consumers of banking services and an increase in the risk of corruption in the context of a decrease in the congruence of the banking sector. In this regard, the continuation of this trend in the medium term can undoubtedly affect the competitiveness of this sector of the economy.

In turn, when studying the dependence of the financial indicators of banks that are controlled by the state on the structure of the assets presented, the degree of its nationalization is characterized. According to the Bank of Russia, only in 2019 this indicator was 73.3%, and in relation to the 20 largest banks, the state concentration was an indicator exceeding the value of 83%, of which the share of assets is accounted for by state-owned banks and banks controlled by state corporations-Rosneft (served by the All-Russian Bank for Regional Development) and Gazprom (served by Gazprombank). Undoubtedly, the main reason for the accelerated nationalization of the sector is the transfer of large financial structures under the management of the central bank itself. As well as the subsequent large-scale financial injections from the regulator and the Ministry of Finance of Russia due to the effect of the sanctions policy after 2015 by the EU states and the lack of development of the legal regime. It should be noted that the problem of weak legal regulation leads to increase the risks of violating the legal framework and the rights of participants in relations, as well as reduces the potential of the domestic banking sector, which negatively affects its attractiveness for both domestic and foreign investors. At the same time, the problem of illegal use of insider information, which entails corruption risks, in Russia is aggravated by the state monopolization of the economy and the stock market as its component. Ownership of bank shares or directly by the bank itself may lead to a conflict of interests.

There are a number of banks where the central bank owns part of the shares or owns them entirely. For example, the six liquid securities by asset concentrated 80% of all funds of traders and investors. These include Sberbank (33%), Gazprom (23%), Norilsk Nickel, LUKOIL, Rosneft and VTB (4-7%). In this regard, if we do not ensure healthy competition based on ensuring equal opportunities for all market participants, it will not be possible to achieve the goals set for the organized market, including the problems of attracting capital and developing the country's economy. At the same time, the legal and economic scientific community has been discussing the feasibility of prohibiting the use of insider information by market participants in transactions. In Russia, the prohibition of the use of insider information is established at the level of a direct law that came into force in 2010. Up to this point, relations in connection with the use of insider information were not regulated at the legislative level; there was only a restriction on its use at the level of corporate regulations, which provide for ethics rules that should prevent employees from using their official position to the detriment of the company and third parties. At the same time, the list of persons who are classified as insiders by law includes heads of federal and regional executive bodies, elected officials, state municipal employees, and others.

A more detailed study of the current legislation prohibiting the misuse of insider information has shown that participants in legislative bodies are not responsible for the use of information in their own interests or for the benefit of third parties. In this case, the legislator does not classify them as insiders and subsequently they are not responsible for the disclosure of confidential information that became clear to them in connection with the performance of their professional duties. Thus, the legislation does not cover a wide range of people who have access to extremely important economic and political information, which has a high competitive advantage (Bikbulatov, 2014). However, the closer the subject who has the information from its original source, the higher the value of the information that the person has. This information allows the person to stay in more favorable conditions than competitors (Dumitrescu, 2012; Suryono et al., 2019; Rahman, 2018). Therefore, if the legislator follows the example of the United States by introducing a prohibition of the misuse of insider information for members of legislative bodies. This will be an important step towards civilized market.

Another problem is the discrepancy between the size of sanctions and fines with the illegal actions of employees in the banking sector. Bankers caught in illegal transactions too often, after revoking the licenses of the bank caught in this, move the team to another bank. This indicates that the sanctions that exists now are not tough enough. Certain measures are required in relation to persons who have been caught in money laundering or other illegal operations, including the dissemination of insider (confidential) information. Consequently, stricter measures and requirements are required not only in relation to employees, but also directly to the bank itself. In most cases, money laundering and small-scale fraud are carried out by small commercial banks that are unable to

profit from banking operations without assistance. By making certain changes regarding the minimum amount of the authorized capital, that is, to increase its amount, in the current law on banking activities. In addition, if you pay attention to the activities of the banking supervision regulator, the number of such banks will decrease, which will lead to minimizing corruption risks in the banking sector.

3. Discussion and Results

Since the banking sector has a huge number of vulnerabilities that are subject to the successful prosperity of the corruption component, in order to determine methods for overcoming corruption in this area, it is important to assess the ratio of the degree of probability of the type of corruption activity, taking into account the identification of the risk of severity of the corresponding event (Fig. 1).

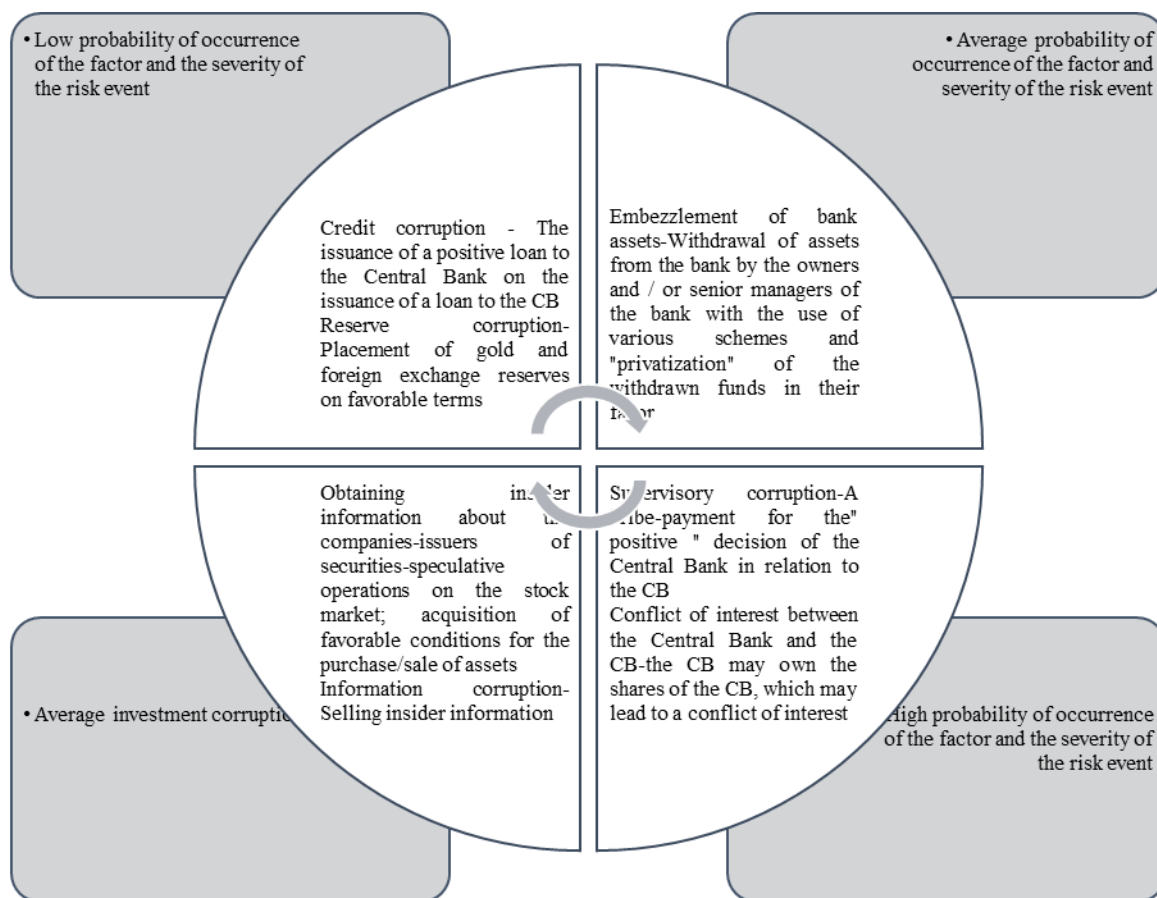


Fig. 1. The matrix of the ratio according to the degree of probability of manifestation of the type of corruption activity and the risk of severity of the corresponding event

Based on the conducted data, when analyzing the matrix of the ratio of the degree of probability of manifestation of the type of corruption activity and the risk of severity of the corresponding event, it was revealed that the most common types of corruption activities were information and supervisory corruption, as well as a conflict of interest between the central and commercial banks. Why are such areas so relevant in modern times? We will conduct a justification.

1) Information corruption. Companies operating in the financial markets determine their lists of insider information and maintain lists of persons who have access to such information. However, keeping track of insiders can be quite difficult. The heavy process of regulating the activities of insiders removes all restrictions for the flourishing of information corruption. Insider information can be of any nature and direction: plans for future large transactions, planned changes in the ruble exchange rate, dates of closing the register, decisions of the board of directors, debt default, change of the management board, dates of face-to-face inspections of banks (Lopez, 2017); as well as of various scales: from small transactions between employees of one bank to speculative transactions between bank employees and employees of other public authorities performing related functions.

2) Supervisory corruption. In accordance with the current legislation, the Bank of Russia is the body of banking regulation and banking supervision regularly carries out inspections of commercial banks, for checking various types of reports. If violations are detected, the audited bank faces suspension of its activities or revocation of its license to exercise banking powers. However, often the heads and employees of inspection and supervisory departments are ready to "turn a blind eye" to violations. Proof of this widespread phenomenon is the mass bankruptcy of commercial banks in the early 2000s (Arnold, 2018). Lending to banks, despite the existing "hole" of liquidity, led banks to bankruptcy, and the money issued was laundered in offshore jurisdictions.

3) Conflict of interest between the central and commercial banks. Since the ownership of bank shares by the central bank is a common phenomenon, the regulator of the sphere categorically cannot act as the owner of what it regulates, because this can lead to a conflict of interests. This circumstance is important at a time when the central bank will take actions to protect the interests of its property, that is, banks where it owns part of the shares or the entire bank. The recipients of the "remuneration" in such cases are, as a rule, the heads of the central bank and its structural divisions. In addition to the above-mentioned acts of corruption, other acts are no less damaging to the effective functioning of the banking system (Barone, 2011). These are, for example, credit, investment and reserve corruption, theft of bank assets.

4) Credit corruption is carried out in approximately the same way as supervisory corruption: commercial banks, in order not to go bankrupt, "buy" a positive decision of the central bank to issue a loan, and the latter, in turn, does not track the further fate of the money received.

5) Reserve corruption involves the placement of foreign currency and gold reserves in the form of opening and replenishing deposit accounts in foreign banks, buying various securities. Agreements with foreign counterparties for the implementation of such operations are held in the strictest secrecy, which does not exclude the possibility of a narrow circle of persons from the central bank to conduct profitable financial fraud.

It is important to note that in recent years, some banks have successfully earned money on investments, and not on loans. For such banks, it is extremely necessary to expand investment operations in order to make a profit on the stock market and establish effective control over companies and assets in various sectors of the economy (Osei-Tutu, 2021). Often, to achieve these goals, commercial banks resort to buying insider information about companies that issue securities, favorable agreements for the purchase and sale of assets, and buying ratings in order to further influence large companies. The listed activities constitute investment corruption.

In the public sphere of the Internet, you can often see negative comments about the following type of corrupt activity – theft of bank assets. The head of a commercial bank may use its assets for the purpose of satisfying personal needs, and sometimes acts in collusion with employees of the central bank (in this case, we are talking about the compatibility of theft of bank assets and supervisory corruption). Special schemes for "laundering" stolen funds and placing them in the "white economy" allow the criminal to commit this corrupt act not once, but on a regular basis.

Thus, the prosperity of corruption in the banking sector is facilitated by the presence of several sources at once. The reason for this is not only the negligent attitude and low moral education of some employees, but also inaccuracies in the wording of normative legal acts concerning the work of credit institutions, as well as weak control by the body that regulates the banking sector, namely the central bank. In this regard, as a mega-regulator,

the central bank supports the stable operation of banks and monitors the entire financial system of the country. Often, the lack of restrictions on the independence of the Bank of Russia's work leads the Central Bank's employees to exceed their powers, commit criminal acts of corruption, and, moreover, to supervise them (Fig. 2).

Banking regulation	<ul style="list-style-type: none"> • Sources of occurrence: the possibility of the Central Bank to be the owner (own shares) of the CB, which entails a conflict of interest; the issue of liability of persons who are guilty of illegally obtaining or disclosing information that constitutes bank secrecy has not been worked out • Form of corruption: sale of insider information; obtaining insider information about companies-issuers of securities-speculative operations on the stock market; acquisition of favorable conditions for the purchase/sale of assets; obtaining information about the conduct of unscheduled inspections of the Central Bank in relation to the CB
Department of Banking Supervision, supervision of banks' activities	<ul style="list-style-type: none"> • Sources of occurrence: officials responsible for checking and supervising the banking sector are not actually responsible for non-performance or improper performance of their duties • Form of corruption: a corrupt transaction between a commercial bank and the Central Bank; payment for the "correct" decision of the Central Bank in relation to the CB; withdrawal of assets under various schemes and money laundering
Banking Supervision Department of the Bank of Russia	<ul style="list-style-type: none"> • Sources of origin: the authority of the Central Bank to establish requirements for the content, procedure and terms of submission to the Bank of Russia of plans for restoring financial stability, the procedure for evaluation, the authority of the Central Bank to determine the methodology for determining systemically important credit institutions • Form of corruption: a bribe for inclusion in the list of systemically important credit institutions; a bribe for resolving the issue with the reporting of a credit institution, allowing this credit institution to be included in the list of systemically important; a bribe for a positive decision on the plan to restore the financial stability of a credit institution, which is evaluated and regulated by the department of banking supervision
Interaction of Central Bank employees with employees of other state authorities	<ul style="list-style-type: none"> • Sources of occurrence: performance by employees of the Central Bank and employees of other public authorities of related functions; • Form of corruption: collusion between employees of these departments in order to receive bribes

Fig. 2. Identified corruption risks in the activities of the central bank structures, depending on the sources of their occurrence

Source: Compiled by the authors according to the data <http://iamruss.ru/13-vidov-korrupsii-s-uchastiem-bankov/>

The ability of a Central Bank to own shares in a commercial bank, together with the obligation to regulate and control the activities of commercial banks, immediately leads to a conflict of interest. The commercial bank is not able to fully dispose of its shares, while the Central Bank is ready to follow only its financial policy. Accordingly, it is only through corrupt transactions that a commercial bank is able to gain some independence in its future activities. In addition, the regulatory functions of the Central Bank include the preservation of banking secrecy. However, in practice, the Central Bank, despite all the prohibitions, successfully practices the receipt and sale of insider information to commercial banks and other financial organizations. The subject of a corrupt transaction may include information about securities issuing companies, information about planned inspections of commercial banks, favorable conditions for the purchase/sale of assets, and other transactions that constitute bank secrecy (Senina, 2020). At the same time, there is no exact and serious punishment for insiders for disclosing information: criminal groups often get off with a small fine, which is not significant in comparison with the funds obtained through corruption, but cases almost never reach the court. Thus, the lack of responsibility for the illegal

receipt or disclosure of information that constitutes bank secrecy also leads to a lack of fear among those who are ready to commit a crime.

A structural division of the Central Bank in the form of a banking supervision department, which functions to monitor (remotely and through contact) the execution and compliance by credit institutions with the legislation regulating banking activities, the regulations established by it, including financial regulations and accounting and reporting rules (Adinoff, 2019; Morozova, 2019). This type of activity is fraught with a huge number of corruption risks. This is not only the withdrawal of assets through various schemes and money laundering, which is quite common in almost every department of the Central Bank, but also the payment for the "right" decision to the Central Bank in relation to a commercial bank (Barry, 2014; Makushkin, 2020). For example, during a face-to-face inspection of a commercial bank, employees and heads of the inspection service may "turn a blind eye" to violations of accounting records and financial statements.

It should be noted that systemically important banks are the most important financial institutions on which the stability of the entire banking system depends. Since their bankruptcy can have serious consequences both for the banking system and for the economy as a whole, their activities must meet strict criteria determined by States and international financial organizations. In the event of bankruptcy, they must be provided with financial assistance from public funds (Arvis, 2013). The Central Bank has the authority to set these criteria and strictly select suitable banks, and to develop plans for restoring financial stability (Chinn, 2003). Thus, the number of a commercial bank in the list of systemically important ones is a kind of "safety cushion" for it, which justifies the desire of banks to be on these lists. However, it is not always possible to talk about fair competition between commercial banks (Egorova, 2020; Mandishekwa, 2021). The successful outcome of numerous inspections by the Central Bank may be covered by the bribery of employees of supervisory inspections, as well as when restoring the financial stability of a credit institution.

5. Conclusions

Having studied the specifics of the occurrence of corruption risks in the banking sector, as well as strategies and approaches to their elimination, it can be noted that this industry requires thorough checks in all its areas of activity. In general, the elimination of corruption risks involves significant work in the authorities, subordinate organizations, and their control. Corruption risks in the banking sector are associated with licensing of activities, insider information, monopolization, issuance and execution of necessary documents, passing inspections and clear supervision of actions. Some individuals, trying to circumvent the law or get something for their own selfish purposes, often use fraudulent transactions. In turn, the persons representing the authorities agree and become participants in the crime. Often, it happens that the initiators of corrupt illegal actions are the employees of the banking sector themselves, wanting to earn additional income from making illegal transactions. Meanwhile, the state takes measures to prevent corruption risks. However, some actions may go unnoticed. In this regard, the need for thorough verification and the creation of new measures to prevent corruption should be strengthened in terms of tougher sanctions in the case of money laundering, namely:

- 1) the introduction of a ban on the profession, that is, work in the financial and credit system, if a group of persons or an official is convicted of it, is made at the discretion of the judge – for a period of 6 months to 8 years and increase the period of disqualification for such types of acts;
- 2) preventing illegal banking activities, namely license corruption and money laundering by small banks, increase the minimum authorized capital for 4 billion rubles. For a newly registered bank with a universal license and at least 600 million rubles. For a newly registered non-bank credit institution – the central counterparty.

References

- Adinoff, B., Reiman, A. (2019). Implementing social justice in the transition from illicit to legal cannabis. *The American Journal of Drug and Alcohol Abuse*, 45(6), 673–88.
- Akhmadullina, A.F. (2014). The question about the legal regime of insider information. *Bulletin of the Volga University named after V.N. Tatishcheva*, 4(81), 62-73
- Arnold, M., Geiger, J-D. (2018). Haftung für Compliance-Verstöße im Konzern. *Betriebs-Berater*, 73, 2306–2312
- Arvis, J. F., Shepherd, B. (2013). The Poisson quasi-maximum likelihood estimator: A solution to the “adding up” problem in gravity models. *Applied Economics Letters*, 20(6), 515–519.
- Bakharev, V.V., Kapustina, I. V., Mityashin, G. Y., & Katrashova, Y. V. (2020). Ecologization of retail: An analysis of strategies. *Siberian Journal of Life Sciences and Agriculture*, 12(5), 79-96. <http://doi.org/10.12731/2658-6649-2020-12-5-79-96>
- Barone, G., Mocetti, S. (2011). Tax morale and public spending inefficiency. *International Tax and Public Finance*, 18(6), 724–749.
- Barrell, R., Holland, D. (2000). Foreign direct investment and enterprise restructuring in Central Europe. *Economic of Transition*, 8(2), 477–504.
- Barry, R.A., Hiilamo, H., Glantz, S. (2014). Waiting for the opportune moment: the tobacco industry and marijuana legalization. *Milbank Quarterly*, 92(2), 207–42.
- Bermpei, T., Kalyvas, A.N., Leonida, L. (2020). Local Public Corruption and Bank Lending Activity in the United States. *Journal of Business Ethics*, 21, 242-254.
- Bikbulatov, T. (2014). Using and Transmitting Insider Information in the Legislative Bodies of the Russian Federation and USA. *Law. Journal of the Higher School of Economics*, 2, 101-112
- Chinn, M., Prasad, E. (2003). Medium-term determinants of current accounts in industrial and developing countries: An empirical exploration. *Journal of International Economics*, 59, 47–76.
- Cohen, R. (2000). The forgotten ones: a survey of recent literature on displaced persons, *Harvard International Review*, 2(4), 86–87
- Cooray, A., Schneider, F. (2018) Does corruption throw sand into or grease the wheels of financial sector development. *Public Choice*, 177, 111–133.
- Dumitrescu, E. I., Hurlin, C. (2012). Testing for Granger Non-Causality in Heterogeneous Panels. *Economic Modelling*, 29(4), 1450–1460.
- Egorova, L.I., Glubokova, N.Y. (2020). *Instruments of Financial Support for Exports*. Proceedings of the 35th International Business Information Management Association Conference, Education Excellence and Innovation Management: A 2025 Vision to Sustain Economic Development during Global Challenges (IBIMA), 5776-5781.
- Fischer, B., Murphy, Y., Kurdyak, P., Goldner, E., Rehm, J. (2015). Medical marijuana programs - why might they matter for public health and why should we better understand their impacts? *Preventive Medicine Reports*, 2, 53–56.
- Golubtsova, E.V., Zvereva, A.O. (2019). *Expediency of parallel import legalization in Russian Federation*. Proceedings of the 33rd International Business Information Management Association Conference, IBIMA 2019: Education Excellence and Innovation Management through Vision 2020, pp. 782-787.
- Herteliu, C., Jianu, I., Jianu, I. (2021). Money’s importance from the religious perspective. *Annals of Operations Research*, 299, 375–399.
- Javaria, K., Masood, O., & Garcia, F. (2020). Strategies to manage the risks faced by consumers in developing e-commerce. *Insights into Regional Development*, 2(4), 774-783. [http://doi.org/10.9770/IRD.2020.2.4\(4\)](http://doi.org/10.9770/IRD.2020.2.4(4))
- Labonte, R., Lencucha, R., Drope, J., Packer, C. (2018). The institutional context of tobacco production in Zambia. *Glob Health*, 4(1), 5-26.
- Lopez, L., Weber, S. (2017). Testing for Granger causality in panel data. *The Stata Journal*, 17(4), 972–984.

- McCorkle, W. (2020). Problematizing Immigration Restrictions during COVID-19 in the Social Studies Classroom. *Research in Social Sciences and Technology*, 5(3), 1-24. <https://doi.org/10.46303/ressat.05.03.1>
- Makushkin G.E., Avvakumova, I.V., Logvina, E.V., Kirillova O.V., Nikitina N.N. (2020). The Financial and Economic Strategy Formation at an Enterprise: Its Impact on a Managerial Decision Making Process. Proceedings of the 35th International Business Information Management Association Conference, Education Excellence and Innovation Management: 2025 Vision to Sustain Economic Development during Global Challenges (IBIMA), 2476-2484.
- Mandishekwa, R. (2021). Rethinking mining as a development panacea: an analytical review. *Mineral Economics* 34, 151–162.
- Mohd-Sanusi, Z., Rameli, M.N.F., Omar, N. (2015). Governance Mechanisms in the Malaysian Banking Sector: Mitigation of Fraud Occurrence. *Asian Criminology*, 10, 231–249.
- Montes, G.C., Luna, P.H. (2021). Fiscal transparency, legal system and perception of the control on corruption: empirical evidence from panel data. *Empirical Economics* 60, 2005–2037.
- Morozova, T., Lehoux, L. (2019). *Practical Aspects of Useful Life Calculation for Fixed Assets in IFRS Reports*. Proceedings of the 34th IBIMA 2019, Vision 2025: Education Excellence and Management of Innovations Through Sustainable Economic Competitive Advantage, 4722-4729.
- Osei-Tutu, F., Weill, L. (2021). How language shapes bank risk taking. *Journal of Financial Services Research* 59, 47–68.
- Palamarchuk, E. A., Mordovtsev, A. Yu., Dudukalov, E. V., Plotnikov, A. A., & Boichuk, D. S. (2019). The Policy of Anti-Semitism in Action: the Events of Crystal Night in the Public Opinion of the United States (Based on the "New York Times" Materials of 1938). *Revista Turismo: Estudos e Práticas*, (1). Retrieved from <http://natal.uern.br/periodicos/index.php/RTEP/article/view/215/163>
- Pasiouras, F., Gaganis, C., Zopounidis, C. (2006). The impact of bank regulations, supervision, market structure, and bank characteristics on individual bank ratings: A cross-country analysis. *Review of Quantitative Finance and Accounting*, 27, 403–438.
- Poghosyan, V. (2018). Philosophies of social behavior research: Meta-analytic review. *Wisdom*, 11(2), 85-92. doi:10.24234/wisdom.v11i2.212
- Rahman, P. A. (2018). Analysis of stationary availability factor of two-level backbone computer networks with arbitrary topology. *Journal of Physics: Conference Series*, 1015(2). <https://doi.org/10.1088/1742-6596/1015/2/022016>
- Reaz, M., Arun, T. (2006). Corporate governance in developing economies: Perspective from the banking sector in Bangladesh. *Journal of Banking Regulation*, 7, 94–105. <https://doi.org/10.1057/palgrave.jbr.2340007>
- Rissy, Y.Y. (2021). The stakeholder model: its relevance, concept, and application in the Indonesian banking sector. *Journal of Banking Regulation*. <https://doi.org/10.1057/s41261-020-00140-2>
- Senina, K.V., Kalacheva, O.N. (2020). *Study of the impact of the COVID-19 pandemic on rental relations in Russia in order to improve the quality of accounting education*. International Conference on Advances in Education (ADVED 2020), 422-428.
- Suryono, S., Surarso, B., Saputra, R., & Sudalma, S. (2019). Real-time decision support system for carbon monoxide threat warning using online expert system. *Journal of Applied Engineering Science*, 17(1), 18-25.
- Yap, O.F. (2020). A New Normal or Business-As-Usual? Lessons for COVID-19 from Financial Crises in East and Southeast Asia. *European Journal of Development Research* 32, 1504–1534.

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A COMPARATIVE STUDY OF INSTITUTIONAL FACTORS INFLUENCING ENTREPRENEURIAL ACTIVITIES: A CASE STUDY OF EGYPT AND SAUDI ARABIA

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Abstract: Researches on entrepreneurship and business enterprise concerning developing nations have normally explored the manners by which, culture, politics, or economic institutions disallow or empower entrepreneurial exercises utilizing macro-level surveys and deductive designs. Accordingly, this research aims to evaluate the extent of the contribution of institutional factors and governmental policies, as well as evaluate their impact on entrepreneurial activities, which in turn leads to the economic development of countries at all levels. Such a study is important to provide a measurement of the impact of Institutional Factors (Cognitive, Regulative, and Normative) on the Entrepreneurial Activities (Service Innovation, Corporate Venturing, and Strategic Renewal) in Egypt and Saudi Arabia (KSA) with measuring the moderation role of personal profile (gender, age, and education). The research approach adopted in this dissertation includes quantitative primary data from a questionnaire collected from 404 respondents from Egypt and 409 respondents from Saudi Arabia. Results showed that there is a significant relationship between Institutional Factors and entrepreneurial activities in both countries and.

Keywords: institutional factors; cognitive dimension; regulative dimension; normative dimension; entrepreneurial activities; service innovation; corporate venturing; strategic renewal

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JEL Classifications: M1, O31, O32, O35

1. Introduction

Researches on entrepreneurship and business enterprise concerning developing nations have normally explored the manners by which culture, politics, or economic institutions disallow or empower entrepreneurial exercises utilizing macro-level surveys and deductive designs (Eijdenberg et al., 2019). First, we need to mention that entrepreneurship and business enterprise have generally extended to catch the attention of many policymakers and governments. The purpose for this is to see entrepreneurship and business enterprise as essential and basic to a country's development and economic growth since it creates both employment opportunities and wealth for the nation (Salimath and Cullen, 2010).

In this way, entrepreneurship was seen as a significant technique for accomplishing economic development around the globe. Global Entrepreneurship Monitor (GEM) reports that entrepreneurship is an

unpredictable procedure that is influenced by explicit cultural and social conditions. GEM found that the positive or negative impression of society concerning entrepreneurship affects the inspirations of individuals to enter business and entrepreneurship. If entrepreneurship is viewed because of the socioeconomic and cultural structure where the individual dwells, at that point, it is clear that family, social behavior, education level, and economic conditions significantly affect a person's entrepreneurial spirit. In this way, it is critical to empower people with the entrepreneurial potential to have their spot in the economic procedures and process (Global Entrepreneurship Monitor Report, 2017/2018).

Such studies focused on the contexts of organization, ethics, business, and community (Bayon et al., 2015). On the other hand, few pieces of research had been devoted to entrepreneurial activities and the reasons beyond having limitations in its applications. Therefore, the researcher has found an essential need to study the entrepreneurial activities and the reasons beyond having limitations in its applications. This leads the researcher to develop this research, through which a comparative study is provided between Egypt and Saudi Arabia (KSA) to study the entrepreneurial activities and the problems facing the application of such activities (Baker and Welter, 2018).

Recently, social researchers give a huge concern about the importance of institutional theory and they try to explain and explore the influence of institutional practices on entrepreneurial activities and practices. However, many researchers have not elaborated on the importance of institutional practices is to innovate, implement, and widespread the new techniques for entrepreneurial activities especially in developing countries. Thus, it has been clear that there is a need to investigate the relation between the institutional practices on entrepreneurial activities and its impact on the developing countries (Jennings and Brush, 2013). Thus, the research aims to fill the research gap identified as a lack of empirical evidence on the investigated point and provide recommendations for academics and practitioners.

2. Literature Review

It has been noticed that there is plenty of innovation and renovation that has been developed on the institutional theory. Some researchers have introduced the institutional theory as the set of social and cultural factors that engage and formulate entrepreneurial events. While, others have discussed it as the socio-cultural environment that surrounds entrepreneurship (Su et al., 2017). All of those concepts have been crystalized and merged to be institutional theory, which gives the institutional framework for entrepreneurship. Thus, the need has been developed the empirical observations of the organizational phenomena that contain the impact of institutional theory and factors on entrepreneurial behaviour (Tolbert et al., 2011).

2.1 The Institutional Theory

It has been claimed that it is very important to understand and know the historical context of studies and investigations of organizations in the mid-1970s when foundational and essential work on institutional theory was first delivered. It is valuable to understanding the core contentions of this viewpoint (Yousafzai et al., 2015). Around then, it has been said that most organizational research mirrored the impact of functionalism as the reigning hypothetical worldview in sociology and, as such, was overwhelmed by investigations of formal organizational structures (Tolbert et al., 2011). Such investigations were based, expressly or (all the more regularly) verifiably, on the presumption that formal structures—workplaces and subunits, composing principles and strategies—were made and maintained because they upgraded the coordination and control of production exercises (activities) and, consequently, the working and the functioning of the organization (Tolbert et al., 2011).

Moreover, Aparicio et al. 2016 adopted an exclusive way to examine institutional effects on entrepreneurship. According to the study findings, the institutional analysis provides a wide view of pictures. Like airy snapshots of societal ground, the picture of institutions gives a broad perspective of an organization and an image of the process of other and more specific socio-cultural and how this process is assured. The intermediate and micro-level approaches to organizational analysis had discussed by (Glover et al., 2014). He also stated that these approaches generate fine-grained detail about socio-cultural processes that are of equal importance. According to, Eijdenberg et al. (2019) who stated that by the nature of big pictures, it cannot provide these many details. Therefore, it should be mentioned that an institutional analysis could be done by only one way of looking

to the social universe, but even though an important and often neglected way to understand societies and organizations. Entrepreneurial success has resulted from the matter of Institutional contexts. There are very few studies, which have investigated the relationship between institutional contextual factors and entrepreneurial activities empirically (Malecki, 2018).

In this way, Szyliowicz and Galvin, 2010 contended that the current literature, while maybe incorporating some intriguing and interesting exact discoveries or empirical findings, doesn't by and large give the sort of hypothetically based ends, conclusions, and calculated models, conceptual models, and constructs. Even though work on global enterprise and international entrepreneurship has used and utilized various hypothetical methodologies and numerous theoretical approaches gotten from an assortment of disciplines. One featured framework of institutional theory has demonstrated significant guarantee with its consideration regarding the effect of context and more extensive social developments, social constructions, and structures for clarifying the advancement of new firms and markets crosswise over universal and international contexts (Zucchella, and Magnani, 2016).

In this study, the institutional theory was applied by adopting the dimensions of institutional factors, studying them well, and analyzing their role on entrepreneurial activities (Service Innovation, Corporate Venturing and Strategic Renewal). Therefore, as mentioned by scholars that there are three components or dimensions of institutions as things that occur inside them, within them, and as a result of them: Regulative, Normative and Cognitive (Aparicio et al., 2016).

2.2 The Entrepreneurial Activities

In Chandra and Leenders (2012) point of view, entrepreneurship refers to individual opportunistic activity that creates value, bears risk, and is strongly associated with innovation. it also can be considered as " a process in which, the opportunity can be recognized and pursuit that leads to growth". Entrepreneurs were further described as coordinators in production and distribution, as well as modern leaders and managers, coordinators, and arbitrageurs. The entrepreneurial activity involves identifying opportunities within the economic system; it is the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes, or markets (Chandra and Leenders, 2012). Entrepreneurship is the mindset and process to create and develop economic activity by blending risk-taking, Service Innovation, and/or innovation with sound management, within a new or an existing organization. Learning, Service Innovation, and innovation have emerged as central constructs to explore entrepreneurial activities (Sosna et al., 2010).

It has been suggested that entrepreneurial ventures are described by underlining the entrepreneurial function and the enterprising capacity of the association or the organization, which permits them a high potential for huge advancement change, significant innovation change, growth, and development (Sakhdari, 2016). Ventures emphasizing and underlining the enterprising capacity and the entrepreneurial function through the adoption of an opportunity-driven business enterprise methodology plan approach and entrepreneurial strategy formulation approach upheld by the value innovation logic and for high development are described as being in a condition of entrepreneurial mode (Dai et al., 2015).

Investigating and exploiting new business opportunities with corporate venture capital investments in innovative new companies and start-ups are a reasonable answer for adapting to the difficulties that the complexity and the multifaceted nature of media innovations guide to media organizations' innovations the executives and management. By investing and putting resources into such enterprises, entrepreneurial ventures, companies, and corporations it is given the chance and the opportunity to increase the insights into the most recent advances and developing emerging markets (Selig and Baltes, 2019). Also, their corporate venture capital exercises and activities help manufacture social capital and draw in them with new arranges over the business, from which they would some way or another have been barred (Selig and Baltes, 2017). Along these lines, it was connecting inside new systems and new networks may demonstrate especially accommodating for organizations to diminish vulnerability, uncertainty and quicken points of interest for research and development (Kunz et al., 2017).

It has been tried to define corporate venture capital as a vital part of an association's innovation tool and accordingly as fundamental to open innovation procedures and strategy (Selig et al., 2018). According to the literature, partnerships firms and corporations working and operating in turbulent environments largely use corporate venture capital as a response to Schumpeterian rivalry and competition (Kunz et al., 2017). By some researchers, others have characterized and defined corporate venture capital as a minority value and equity investment by start-ups and enterprises in a privately held entrepreneurial venture. Relating to the corporate venture capital idea utilized by a few scholars, the definition, for the most part, excludes and rejects investments that are situated within the more extensive classification of corporate venturings, such as, business start-ups, entrepreneurship, and acquisitions (Jones and Rowley, 2011).

The organizational and the authoritative structure of corporate venture capital projects demonstrates the way corporate venture capital exercises are composed and situated inside or outside the funding and the financing corporation. Generally speaking, how a program is organized to a great extent decides the level of self-sufficiency and autonomy with which a venture is represented and governed (Raynor, 2012). Researchers have introduced this concept gives a general review of possible investment programs that is largely applicable to different works and has been utilized as a structure in late studies (Selig and Baltes, 2019). Some authors recognize four fundamental organizational forms and types of corporate venture capital investments, which range on a continuum of tight to wide incorporation structures with the parent organization: (1) direct investments, (2) entirely owned subsidiaries, (3) committed corporate venture reserves or funds, or (4) corporate venture capital as limited partner (Kunz et al., 2017).

One of the activities of entrepreneurial activities that the literature has mentioned is strategic renewal. Top directors and managers of global enterprises and multinational corporations are progressively gone up against with a quickening rate of progress and change in the external environment (Schmitt et al., 2018). However strategic renewal literature has dedicated constrained attention regarding the organizational instruments and mechanisms empowering firms to adjust internal with external rates of progress and change, to accomplish a powerful dynamic firm-environment suitable and fit after some time (Schmitt et al., 2016).

The strategic adaptations happen inside the association's present strategic structure or business model. On the other hand, discontinuous renewal alludes to progressively crucial, path-breaking changes that replace the association's present resource configurations and arrangements (Al Humaidan and Sabatier, 2017). These renewal initiatives and exercises happen outside the association's present strategic structure and result in the reception of another business model. Following these contentions, it was defined and characterized strategic renewal as a managerial procedure of changing or replacing an association's present business model to address developing and emerging environmental opportunities, chances, risks, and dangers for long-run endurance (survival) and flourishing (prosperity) (Schmitt et al., 2018). This definition is lined up with a co-evolutionary perspective on strategic renewal as recursive associations between environmental drivers and a company's strategic adaptation (Schmitt et al., 2018).

2.3 Entrepreneurial Action and Institutional Environment

Many researches on institutional environments regarded these environments as fixed or normally developing and naturally evolving. The connection between such environments and entrepreneurship was viewed as impenetrable to intentional activity and action (Carlos, 2013). For instance, early work at new authoritative forms and organizational structures by many population ecologists regarded legitimacy as a characteristic procedure and natural process that just happened after some time (Alvedalen and Boschma, 2017). As a hierarchical structure and organizational form turned out to be progressively common and prevalent, it normally moved toward becoming seen as increasingly legitimate (Stewart, 2014). The hidden procedures, underlying processes of entrepreneurial activities, and exercises that drove expanded or diminished establishing and founding rates were to a great extent neglected. Also, some researchers tried to create a conceptualization of institutionalization. Additionally, they recommended a natural, characteristic, and ineluctable progression (Sine and David, 2010).

From their point of view, activities and exercises that in the long run become taken for granted begin as very objective answers and quite rational solutions for a specific problem and a particular issue; as such, their use

increments after some time (Hopp and Stephan, 2012). However, eventually, the activities and the exercises form into a standard and a routine that takes on emblematic worth and value. Diffusion and persistence become less reliant on the fit between the training or the practice and the original problems and issues. This is exemplified by scholars who investigated the adoption and the reception of civil service reforms and changes (Shinnar et al., 2014). They found that underlying appropriation was altogether anticipated by the requirement for change and reform. However, as the commonness and the prevalence of the changes and reforms expanded, the relationship between need and adoption reduced. The recent investigation likewise on occasion embraces this fairly deterministic approach (Sine and David, 2010).

In this case, one of the key roles of a businessman or entrepreneur is to justify the new venture also, its structure, and to influence different constituents to take part in making, distributing, purchasing, and utilizing its outputs. Accordingly, recent studies have been started to all the more expressly focus on how an entrepreneur can deliberately make an air of acceptability around their ventures and thusly systematize and institutionalize new classes of practices, products, organizations, and associations (Carlos, 2013). Business visionaries embrace different activities to cause their association and firm to seem, by all accounts, to be more harmonious with the existing and acceptable norms, standards, and values. Side by side, it could be considered the entrepreneurs utilize all or most of the cultural symbols deliberately and strategically to improve and enhance their firms and organizational legitimacy and credibility (Sine and David, 2010).

For instance, it was located that new ventures that are not isomorphic with predominant social standards, norms, and values are destined to fail. These theories have a Darwinian character to them: those associations that best fit the environment survive (Thornton et al., 2011). On the other hand, As opposed to this regular progression perspective on legitimation, defenders of a more activity-oriented view propose that the legitimation and organization or institutionalization of another organizational form and structure can be deliberately controlled by entrepreneurial activities (Sine and David, 2010).

Establishing another firm is one institutional arrangement that is commonly accessible for people in the economy and is one that can possibly affect the economy. The behavioral practice and routine of entrepreneurship and enterprise through the actionable production of another business is consequently significant, important, and critical in a financial and economic sense, as another element is made where it didn't exist previously (Urbano et al., 2019). Furthermore, the financial impact and the economic influence of new venture establishment can be assessed after the new pursuit is established (Salimath and Cullen, 2010).

Based on of 2017-2018 (GEM) report, the ratings of government programs for entrepreneurship show wide variation between economic development levels – both factor- and efficiency-driven economies. It showed that North America including (the USA and Canada) has supportive entrepreneurial framework conditions while Africa as well as Latin America struggle with the least favorable entrepreneurship environment. Furthermore, the report showed that in Egypt, more than one-tenth of adults have discontinued a business in 2017.

The report also presented the ranking of 54 countries against the national entrepreneurial framework which includes the government ranking from the aspect of policies support as well as the entrepreneurship programs. According to the report, the economic development phase of Egypt is efficiency-driven with GDP of \$330.8 billion in 2015. On the other hand, Saudi Arabia the economic development phase with a GDP of \$653.2 billion in 2015, it is an efficiency-driven economy.

Based on the survey of Global Entrepreneurship Monitor (GEM), it was found that there is a gender gap in entrepreneurial activity worldwide, as in the process of starting a business or operating new businesses men are significantly more than women being (Urbano et al., 2019). Entrepreneurship and an individual's economic well-being are resulted from significantly connection with education abilities. As physical assets an individual's is a form of capital that provides long terms economic benefits; abilities can be acquired through education and training (Bayon et al., 2015). The abilities of human capital enhance the productivity of an individual. Moreover, higher level of education and training implies higher productivity, and higher productivity, in turn, lead to higher wages (greater economic well-being). Therefore, absence of a readily available market, for instance, a market for entrepreneurs, individuals would not invest in acquiring entrepreneurship-specific abilities thereby lacking the abilities necessary to effectively pursue entrepreneurship (Bayon et al., 2015).

Thus, the first dimension that will be quickly talked about is innovation: innovative entrepreneurs take favored situation of existing learning, starting at now made (regardless of the way that underutilized) by officeholders, to make open entryways for improvement that don't generally remove adversary firms (Dheer, 2017). Additionally, when starting a new venture, businesspersons over the long term produce new data, thusly making further open entryways for enhancement that will be seen and misused by others (González-Pernía et al., 2012). The impact of operational control on the costs of the organization issue is an essential perspective for perceiving how entrepreneurial action besides, its progression execution results are likely affected by exercises control frameworks (García-Rodríguez et al., 2017). Specifically, improvement-focused controls authorized by individuals at the methodology or arrangement-making levels of the firm may smother the positive association between innovative movement and its results (Dheer, 2017). As needs are, the hypothesis that mirrors previous statement is that:

H1: There is a significant relationship between Institutional Factors and Service Innovation

As investigated by (Baumol, 2010), the regulatory institutions and to the standards and the norms that impact the attitudes and the behaviors of society towards the different kinds of business enterprise and entrepreneurship that will affect the worth credited to any entrepreneurial activity or practice. In any case, his typology is some way or another constrained as people likewise participate in informal entrepreneurship and business enterprise in nations with progressively stable institutional arrangements where one would accept the motivating incentives forces for beneficial business and productive entrepreneurship to be set up (Welter and Xheneti, 2015). It was discovered that both regulatory and normative institutions at the same time can empower and oblige individual activities, they change and are changed by individual attitudes and behaviors. As to informal entrepreneurship and enterprise, an institutional methodology gives further insights into how people explore inside the various degrees of their institutional environment (De Castro et al., 2014).

Therefore, the subsequent diminution is Corporate Venturing, it could be characterized as entrepreneurial efforts in which developed affiliations and associations put assets and resources into or potentially make new associations, either independent from any other individual or in relationship with various organizations (Dai, et al., 2015). A few articles and searches separate between two sorts of Corporate Venturing, which are internal and external Corporate Venturing, in internal Corporate Venturing new associations live inside the internal limits of a firm, yet they may go about as semi-independent components (Kadir et al., 2018). In other hand, the external Corporate Venturing is worried about the creation of new associations by startups and enterprises in which an organization utilizes external assistants and outer accomplices in a worth or non-esteem between definitive connections and authoritative relationships (Sakhdari, 2016). In like manner, the hypothesis that reflects the previous statement is that:

H2: There is a significant relationship between Institutional Factors and Corporate Venturing

In the normative or standard context, it has been investigated the combination and the conjunction between abstract standard business enterprise and subjective norm entrepreneurship (Lortie et al., 2019). The examination of the study has presented how the enterprising self-adequacy and entrepreneurial self-efficacy is barely refining the person's confidence in their particular capacity to effectively launch a new startup or an entrepreneurial venture. As needs be, the institutional components considered in this exploration the cognitive, regulatory, and normative dimensions or measurements. The three measurements' impact is analyzed on the entrepreneurial activities (Sáez-Martínez, 2011).

The third diminution is Strategic Renewal, which is a firm's transformation as far as changing its extent of business or key methodology; it is broadly defined as the "change of organizations through recharging of the key thoughts on which they are assembled". The third diminution will be progressively fruitful when collaboration helps spread the innovation and improves its adequacy in the business (Klammer, 2017). Strategic Renewal is reflecting the change of associations through the recharging of key thoughts on which they are constructed, hierarchical restoration including major key or potentially basic changes. Furthermore, it is more a top-down procedure of reclassifying existing capability bases (Wambugu, 2014). It can pursue from the formation of new capabilities of progressively basing up procedures, for example, development or wandering (Sekaran and Bougie, 2016). Accordingly, the hypothesis that reflects the previous statement is that:

H3: There is a significant relationship between Institutional Factors and Strategic Renewal

3. Research Methodology

In this section, the researcher represents the data collection and sample selection, variables and measurements, and framework of the study.

3.1 Data collection and sample selection

It could be stated that the questionnaire is a quantitative method is utilized to collect primary data for investigation (Sekaran and Bougie, 2016). According to the research aim, which is enhancing and developing a structure for institutional factors that cope with entrepreneurial activities. As the researcher has mentioned above the research design is the quantitative method thus, the questionnaire will be utilized as a tool for collecting the sample of the research, which is a convenient sampling, is used to select the Entrepreneurs from Egypt and Saudi Arabia. The target population is the entrepreneurs of Egypt and Saudi Arabia. A convenient sampling is used to select the Entrepreneurs from these countries. There are various methods for data collection. For the purpose of this, research is to develop a framework for institutional factors that cope with entrepreneurial activities. There are various methods for distributing questionnaires. For example, studies can collect information and administer questionnaires through the telephone, postal mail, email, web servers, or face-to-face (personally). In this research, it was preferred the online method by Emails and online application. There are various reasons to select an online method. This method provides respondents easy accessibility and submission through a computer or mobile.

3.2 Variables and Measurements

There are two main types of variables, which used in this study; the dependent and independent variables.

3.2.1 Dependent Variable

The dependent variable for this study is considered as Institutional Factors (Cognitive, Regulatory, and Normative).

3.2.2 Independent Variable

There independent variables: Entrepreneurial Activities (Service Innovation, Corporate Venturing, and Strategic Renewal).

Moderating Variable

The Personal Profile (Gender, Age, Education) are considered as moderating variables (see Figure 1 and Table 1).

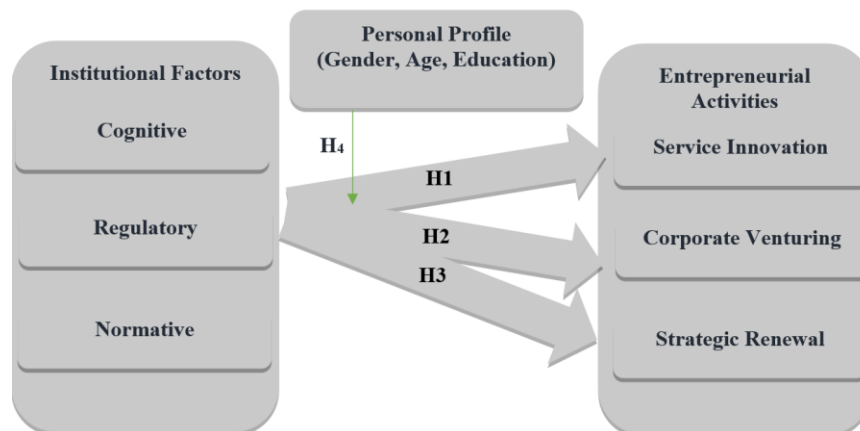


Figure 1: Relationship Diagram between independent variables and dependent variables

Table 1: presents a summary for all the variables including the dependent and independent of the study.

Research Variable	Variables	Measurement
Institutional Factors	Normative factor: Entrepreneur's image and social status	1. In my town, successful entrepreneurs enjoy high status and respect in society. 2. In my town, creating new firms is considered a morally good way to make money. 3. In my town the majority of people think that entrepreneurs are competent and self-sufficient, 4. In my town, becoming an entrepreneur is considered a desirable professional option. 5. In my town business skills, creativity and innovative thinking are highly valued. 6. In my town, people who start new businesses are portrayed as successful in the media.
	Cognitive factor: Local business experience	7. In my town there are many people experienced in creating new firms. 8. In my town, many people know how to respond to good opportunities by creating new firms. 9. In my town, almost everybody knows somebody who has recently set up a new firm. 10. In my town, many people are able to organize the resources necessary to create a new firm.
	Regulative factor: Legal incentive for entrepreneurship	11. In my town, the laws are applied to new firms predictably and coherently. 12. In my town, there are laws and regulations relating to new firm creation. 13. In my town, the regulations concerning new firms and growing firms are adequate and effective. 14. In my town, the package of incentives for business is sufficient for the creation of new firms. 15. In my town, there is public aid available to assist in the creation of new firms.
Entrepreneurial Activities	Service Innovation	16. During the past three years, our company has made more efforts to optimize its service processes. 17. During the past three years, our company has made more efforts to design new services. 18. During the past three years, our company has launched more themed marketing campaigns. 19. During the past three years, our company has made greater efforts to establish marketing channels. 20. During the past three years, our company has made greater efforts to attract customer attention by using creative ideas.
	Corporate Venturing	21. During the past three years, our company expanded its operations by leasing new properties. 22. During the past three years, our company has expanded its operations by setting up new or joint venture companies with other parties. 23. During the past three years, our company has expanded its operations through management contracts
	Strategic Renewal	24. During the past three years, our company has repositioned itself. 25. During the past three years, our company has gradually changed its target markets. 26. During the past three years, our company has gradually changed its business strategies. 27. During the past three years, our company has dramatically changed its organizational structure.

Source: based on Dai et al. (2015) and Garcia-Cabrera et al. (2018)

4. Descriptive Statistics

Table 2 shows the respondent profile in Saudi Arabia. Regarding Age, it could be observed that the number of respondents in the age group of '30-39' (n = 208) is the highest compared with other age groups, with a percentage of 43.7%. Considering Gender, it could be noticed that 'Male' respondents are the most frequently appearing, with a number of '346' respondents and a percentage of 77.3% of the sample under study. According to Marital Status it could be observed that the number of 'Single' (n = 202) respondents is the highest compared with other marital status, with a percentage of 49.3%. Also, it could be observed that the number of respondents with 'Master's degree' (n = 166) is the highest compared with other education level, with a percentage of 40.58%. Finally, it could be observed that the number of respondents with income more than 20,000 (n = 274) is the highest compared with other income level, with a percentage of 66.99%.

While in Egypt, Table 3 illustrates this by showing the frequencies for the respondent profile. Regarding Age, it could be observed that the number of respondents in age group of '30-39' (n = 176) is the highest compared with other age groups, with a percentage of 43.6%. Considering Gender, it could be noticed that 'Male' respondents are the most frequently appearing, with a number of '314' respondents and a percentage of 77.7% of the sample under study. According to Marital Status it could be observed that the number of 'Married' (n = 168) respondents is the highest compared with other marital status, with a percentage of 41.6%. Also, it could be observed that the number of respondents with 'Master's degree' (n = 131) is the highest compared with other education level, with a percentage of 32.4%. Finally, it could be observed that the number of respondents in with income level of '5,001 – 10,000' (n = 256) is the highest compared with other income level, with a percentage of 63.4%.

Table 2: Respondent Profile in KSA

	Frequency	Percent%	Total
Age			
22-29	14	3.4	409
30-39	208	50.8	
40-49	110	26.8	
50-59	70	17.1	
60 or older	7	1.7	
Gender			
Male	328	80.1	409
Female	81	19.8	
Marital Status			
Single	202	49.3	409
Married	138	33.7	
Widowed	37	9.04	
Divorced	32	7.8	
Education			
Associate degree	59	14.4	409
Bachelor's degree	82	20.04	
Master's degree	166	40.58	
Professional degree	48	11.7	
Doctorate degree	46	11.2	
Other	8	1.95	
Income			
Less than 5,000	16	3.9	409
5,001 – 10,000	8	1.95	
10,001 – 15,000	26	6.35	
15,001 – 20,000	85	20.78	
More than 20,000	274	66.99	

Table 3: Respondent Profile of Egyptians

	Frequency	Percent%	Total
Age			
22-29	15	3.7	404
30-39	176	43.6	
40-49	126	31.2	
50-59	79	19.6	
60 or older	8	2	
Gender			
Male	314	77.7	404
Female	90	22.3	
Marital Status			
Single	152	37.6	404
Married	168	41.6	
Widowed	45	11.1	
Divorced	39	9.7	
Education			
Associate degree	67	16.6	404
Bachelor's degree	94	23.3	
Master's degree	131	32.4	
Professional degree	55	13.6	
Doctorate degree	49	12.1	
Other	8	2	
Income			
Less than 5,000	20	5	404
5,001 – 10,000	256	63.4	
10,001 – 15,000	92	22.8	
15,001 – 20,000	28	6.9	
More than 20,000	8	2	

5. The results

In this section, the hypotheses under study are tested using the correlation and regression (Testing the Relation between Institutional Factors (Cognitive Factor, and Regulative Factor) and Entrepreneurial Activities (Service Innovation, Corporate Venturing, and Strategic Renewal).

Table 4 shows the SEM analysis of the impact of Institutional Factors; Normative Factor, Cognitive Factor, Regulative Factor on Entrepreneurial Activities; Service Innovation, Corporate Venturing, Strategic Renewal in Saudi Arabia. It could be observed that there is a significant positive effect of Normative Factor, Cognitive Factor, and Regulative Factor on Service Innovation as the estimate coefficients are 0.372, 0.167, and 0.320 and P-values are less than 0.05. Moreover, the R square is 0.568, which means the Institutional Factors can explain 56.8% of the variation of the Service Innovation together. Furthermore, there is a significant positive effect of Normative Factor, Cognitive Factor, and Regulative Factor on Corporate Venturing as the estimate coefficients are 0.235, 0.231, and 0.317 and P-values are less than 0.05. Moreover, the R square is 0.336, which means the Institutional Factors can explain 33.6% of the variation of the Corporate Venturing together.

Moreover, there is a significant positive effect of Normative Factor, Cognitive Factor, and Regulative Factor on Strategic Renewal as the estimate coefficients are 0.295, 0.261, and 0.200 and P-value is less than 0.05. Moreover, the R square is 0.606, which means the Institutional Factors can explain 60.6% of the variation of the Strategic Renewal together. The model fit indices; CMIN/DF = 4.120, GFI = 0.812, CFI = 0.876, AGFI= 0.768, and RMSEA = 0.094. The SEM model conducted is illustrated in Tables 4-5 and Figures 2-3.

Table 4: SEM Analysis (KSA)

			Estimate	P	R ²
Service Innovation	<---	Normative Factor	.372	***	.568
Service Innovation	<---	Cognitive Factor	.167	***	
Service Innovation	<---	Regulative Factor	.320	***	
Corporate Venturing	<---	Normative Factor	.235	.009	.336
Corporate Venturing	<---	Cognitive Factor	.231	***	
Corporate Venturing	<---	Regulative Factor	.317	***	
Strategic Renewal	<---	Normative Factor	.295	***	.606
Strategic Renewal	<---	Cognitive Factor	.261	***	
Strategic Renewal	<---	Regulative Factor	.200	***	

The model fit indices; CMIN/DF = 4.120, GFI = 0.812, CFI = 0.876, AGFI= 0.768, and RMSEA = 0.094. The SEM model conducted is illustrated in Figure 2.

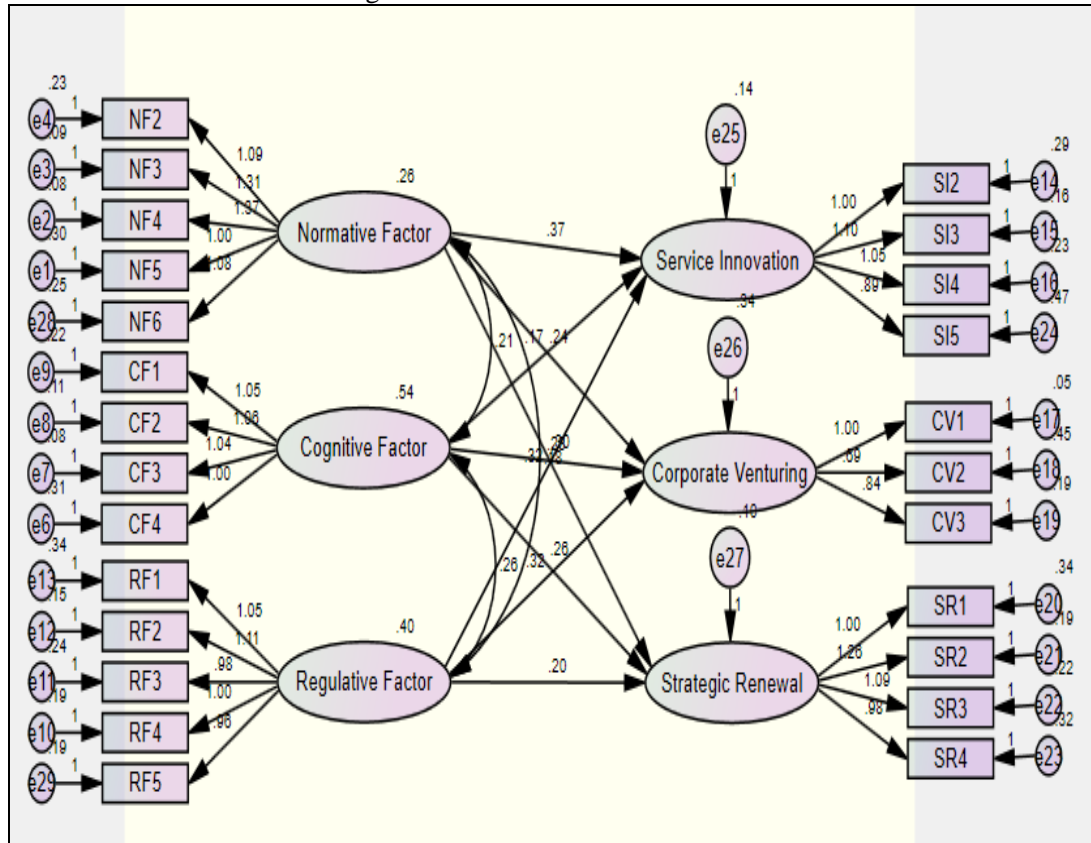


Figure 2: SEM for Model of KSA

Table 5 shows the SEM analysis of the impact of Institutional Factors; Normative Factor, Cognitive Factor, Regulative Factor on Entrepreneurial Activities; Service Innovation, Corporate Venturing, Strategic Renewal in Egypt. It could be observed that there is a significant positive effect of Cognitive Factor on Service Innovation as the estimate coefficient is 0.170 and P-value is less than 0.05, while there is an insignificant effect of Normative Factor, and Regulative Factor as the P-values are more than 0.05. Moreover, the R square is 0.311, which means the Cognitive Factor can explain 31.1% of the variation of the Service Innovation. Furthermore, there is a significant positive effect of Regulative Factor on Corporate Venturing as the estimate coefficient is

0.316 and P-value is less than 0.05, while there is an insignificant effect of Normative Factor, and Cognitive Factor as the P-values are more than 0.05. Moreover, the R square is 0.421, which means the Regulative Factor can explain 42.1% of the variation of the Corporate Venturing.

Moreover, there is a significant positive effect of Cognitive Factor and Regulative Factor on Strategic Renewal as the estimate coefficients are 0.295 and 0.395 and P-value is less than 0.05, while there is an insignificant effect of Normative Factor as the P-value is more than 0.05. Moreover, the R square is 0.504, which means the Cognitive Factor and Regulative Factor can explain 50.4% of the variation of the Strategic Renewal together.

Table 5: SEM Analysis of Egypt

			Estimate	P	R ²
Service Innovation	<---	Normative Factor	.128	.170	.311
Service Innovation	<---	Cognitive Factor	.170	.041	
Service Innovation	<---	Regulative Factor	.091	.092	
Corporate Venturing	<---	Normative Factor	.187	.072	.421
Corporate Venturing	<---	Cognitive Factor	.023	.801	
Corporate Venturing	<---	Regulative Factor	.316	***	
Strategic Renewal	<---	Normative Factor	.183	.152	.504
Strategic Renewal	<---	Cognitive Factor	.295	.010	
Strategic Renewal	<---	Regulative Factor	.395	***	

The model fit indices: CMIN/DF = 1.900, GFI = 0.914, CFI = 0.910, AGFI= 0.897, and RMSEA = 0.042 are all within their acceptable levels. The SEM model conducted for the effect of the Knowledge Management dimensions and SMEs Performance dimensions is illustrated in Figure The model fit indices; CMIN/DF = 5.748, GFI = 0.834, CFI = 0.863, AGFI= 0.777, and RMSEA = 0.109. The SEM model conducted is illustrated in Figure 3.

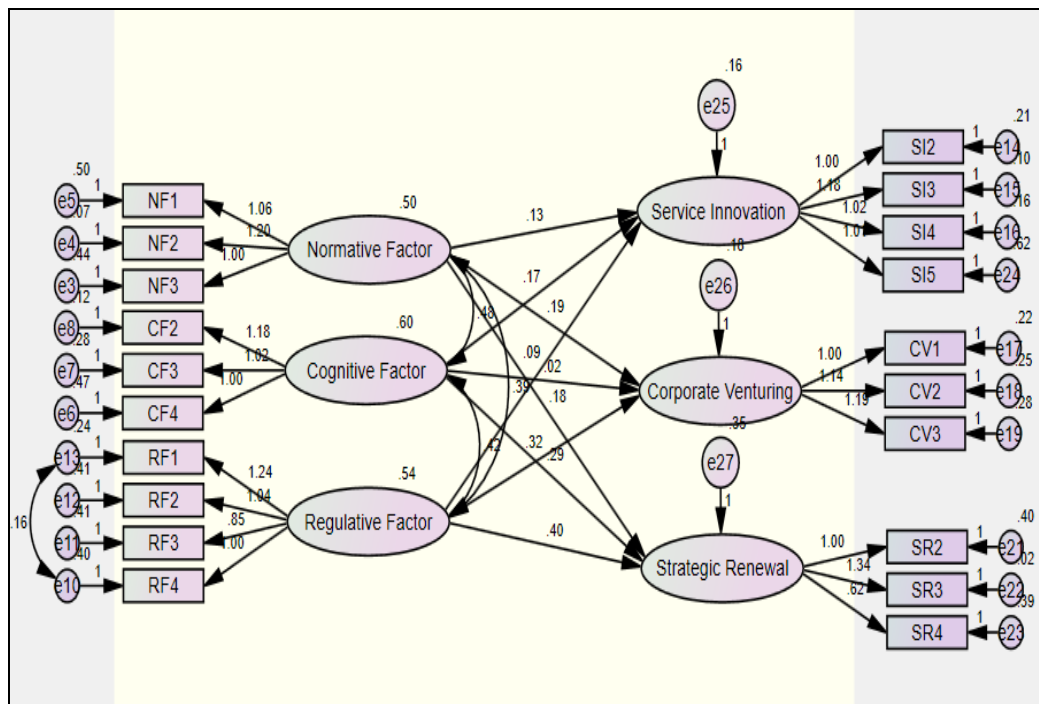


Figure 3: SEM Model (Egypt)

Therefore, based on the analysis the first hypothesis the researcher found that There is a significant relationship between Institutional Factors and Service Innovation is fully supported in both countries. Therefore, based on the analysis the second that There is a significant relationship between Institutional Factors and Corporate Venturing is fully supported KSA and Partially Supported in Egypt. Therefore, based on the analysis the third hypothesis that there is a significant relationship between Institutional Factors and Strategic Renewal is Fully Supported in KSA and Partially Supported in Egypt (see Table 6).

Table 6: Summary of Hypotheses Results

Hypotheses	Description	Results
H ₁	There is a significant relationship between Institutional Factors and Service Innovation	Fully Supported in both countries
H ₂	There is a significant relationship between Institutional Factors and Corporate Venturing	Fully Supported in KSA and Partially Supported in Egypt
H ₃	There is a significant relationship between Institutional Factors and Strategic Renewal	Fully Supported in KSA and Partially Supported in Egypt

6. Contributions and Originality

This research aims to investigate the impact of Institutional Factors (Cognitive, Regulatory, and Normative) on Entrepreneurial Activities (Service Innovation, Corporate Venturing, and Strategic Renewal); in addition, the moderating role of Personal Profile. The contribution is that this research specified its study in the context of comparative study between Egypt and Saudi Arabia (KSA).

As a result, the research contributes to the managers and entrepreneurs to comprehend how Institutional Factors dimensions can affect Entrepreneurial Activities, so they can utilize the Cognitive, Regulatory, and Normative factors in order to enhance the Service Innovation, Corporate Venturing, and Strategic Renewal in firms and organizations.

The contribution of this research represented in, the researcher aims to test the impact of Institutional Factors (Cognitive, Regulatory, and Normative) on Entrepreneurial Activities (Service Innovation, Corporate Venturing, and Strategic Renewal); in addition, the moderating role of Personal Profile. The contribution is that this research specified its study in the context of comparative study between Egypt and Saudi Arabia (KSA) as the reviewing of the previous literature showed that previous studies focused on the middle-income level countries will examining this relation. On the other hand, this study focuses on entrepreneurs and also makes a comparison between Egypt and Saudi Arabia (KSA), in order to fill the gap of studies in this manner.

7. Recommendation

Recommendations for decision makers and managers in organizations should focus on the Institutional Factors; Cognitive, Regulatory, and Normative to enhance Entrepreneurial Activities; Service Innovation, Corporate Venturing, and Strategic Renewal. Also, they should focus on other factors that may affect the relationship between the Institutional Factors and Entrepreneurial Activities. According to the results, there is significant relationship between Institutional Factors; Cognitive, Regulatory, and Normative to enhance Entrepreneurial Activities; Service Innovation, Corporate Venturing, and Strategic Renewal.

Through the previous findings of the research, it recommends some policies and procedures as follows:

- The study suggests encouraging entrepreneurship activities that generate new ideas, products, or services in whole or in part. The interest in increasing the number of new projects is not only without regard to the importance of their products. Policies that are unable to distinguish between livelihood projects and high value-added projects may generate harmful long-term outcomes.
- Interest in establishing a strong system to guarantee material and intellectual property rights through the legal and political environment, as the study showed the importance of protecting property rights in supporting entrepreneurial activities.

- Encouraging and educating individuals about the importance of entrepreneurship and encouraging centres that train and increase the skills and capabilities of entrepreneurs.
- The inclusion of entrepreneurship courses in the form of seminars for some group disciplines and vocational training centres, provided that they are mandatory in disciplines related to self-employment and of greater importance.
- The need for the university to adopt an entrepreneurship strategy as an attempt to spread and develop a new culture among students, which changes in their minds the culture of typical work, through coordination and integration between university education policies and entrepreneurial education, in order to ensure the link between the outputs of the university educational system and the requirements of the labour market.
- Encouraging university leaders who are interested in the idea of entrepreneurship, to motivate students to adopt this thought, and to discover new ideas for students.
- The initiative in concluding contracts and agreements with research agencies and businessmen to support youth entrepreneurial projects.
- Hiring successful entrepreneurs to give lectures, conduct seminars, and meet with youth and employees, as they serve as role models.
- The need for a central mechanism that takes into account the training skills needed by entrepreneurs, and reaches all employees, even in remote areas; By providing training programs that help them know how to establish projects or expand their management, and deliver products to foreign markets, learn skills for doing feasibility studies, promoting products, how to develop negotiation with external parties.
- Supporting the pioneering performance of the company's employees.
- Simplifying administrative procedures for current and potential entrepreneurs.
- Spreading a culture of awareness and knowledge about the pioneering projects and the proposed opportunities for the novice pioneers and the success of the future.
- Conducting studies to identify the reality of entrepreneurship in commercial industrial companies in Egypt and Saudi Arabia.
- Decision makers in the Arab world in general should lay the foundations that support entrepreneurs, especially young ones, to establish and develop their various projects, which in turn contribute to achieving economic development goals.
- The necessity of establishing mechanisms to secure and guarantee loans for pilot projects.
- Removing legislative obstacles to the participation of equity funds and venture capital in developing the financial resources available for these entrepreneurial projects.

8. Limitations

As all researches, this research has several limitations through the study handled. First, despite the fact that the researcher collected the data from 1 Egypt and Saudi Arabia (KSA) represented by Egypt and Saudi Arabia, yet, the research was limited to take into consideration more countries from middle-income level countries. Second limitation for this research is the time limitation to finish the research, which was a constraint for collecting larger sample size to represent the data under study. A third limitation was the sampling technique considered in this research, as the researcher used the convenient method of sampling which is a non-random technique, rather than depending on the random techniques due to the difficulty in obtaining a sampling frame for entrepreneurs in Egypt and Saudi Arabia. This limitation is because handling more questionnaires was causing a kind of redundancy in information, which let the researcher stop collecting more data. Also, for future researches it could be useful to use qualitative analysis in addition to the quantitative analysis.

This research has several recommendations that could be useful for future research. First, a longitudinal study would be recommended for better results, as time was one of the barriers in this study. Future research could also consider other middle-income level countries. In addition, larger number of sample size would make more accurate results but that could be costly. Future research would be able to have better time frame to be able to collect larger sample as well as following a random sampling technique. Finally, a comparative study could be conducted to compare between factors affecting Entrepreneurial Activities in Egypt and Saudi Arabia (KSA).

References

- Al Humaidan, S. and Sabatier, V. 2017. Strategic renewal in times of environmental scarcity. *Journal of Organizational Change Management*, 30(1). <http://doi.org/10.1108/JOCM-09-2015-0161>
- Alvedalen, J. and Boschma, R. 2017. A critical review of entrepreneurial ecosystems research: Towards a future research agenda. *European Planning Studies*, 25(6), 887-903. <http://doi.org/10.1080/09654313.2017.1299694>
- Aparicio, S., Urbano, D. and Audretsch, D. 2016. Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence. *Technological Forecasting and Social Change*, 102, 45-61. <https://doi.org/10.1016/j.techfore.2015.04.006>
- Baker, T. and Welter, F. 2018. Contextual entrepreneurship: An interdisciplinary perspective. *Foundations and Trends® in Entrepreneurship*, 14(4), 357-426. <http://doi.org/10.1177/0266242610391936>
- Baumol, W.J. 2010. *The micro theory of innovative entrepreneurship*. Princeton University Press.
- Bayon, M.C., Vaillant, Y. and Lafuente, E. 2015. Antecedents of perceived entrepreneurial ability in Catalonia: the individual and the entrepreneurial context. *Journal of Global Entrepreneurship Research*, 5(1), 3. <http://doi.org/10.1186/s40497-015-0020-0>
- Ben-Menahem, S.M., Kwee, Z., Volberda, H.W. and Van Den Bosch, F.A. 2013. Strategic renewal over time: the enabling role of potential absorptive capacity in aligning internal and external rates of change. *Long Range Planning*, 46(3), 216-235. <http://dx.doi.org/10.1016/j.lrp.2012.09.012>
- Bruton, G.D., Ahlstrom, D. and Li, H.L. 2010. Institutional theory and entrepreneurship: where are we now and where do we need to move in the future? *Entrepreneurship Theory and Practice*, 34(3), 421-440. <http://doi.org/10.1111/j.1540-6520.2010.00390.x>
- Carlos, W. 2013. From surgeries to startups: How institutions shape entrepreneurial activity in the field of health care. <http://dx.doi.org/10.2139/ssrn.2208722>
- Casidy, R., Nyadzayo, M. and Mohan, M. 2019. Service innovation and adoption in industrial markets: An SME perspective. *Industrial Marketing Management*, 89, 157-170 <https://doi.org/10.1016/j.indmarman.2019.06.008>
- Chandra, Y. and Leenders, M.A. 2012. User innovation and entrepreneurship in the virtual world: A study of Second Life residents. *Technovation*, 32(7-8), 464-476. <http://doi.org/10.1016/j.technovation.2012.02.002>
- Dai, W.D., Mao, Z.E., Zhao, X.R. and Mattila, A.S. 2015. How does social capital influence the hospitality firm's financial performance? The moderating role of entrepreneurial activities. *International Journal of Hospitality Management*, 51, 42-55. <http://dx.doi.org/10.1016/j.ijhm.2015.08.011>
- De Castro, J.O., Khavul, S. and Bruton, G.D. 2014. Shades of grey: how do informal firms navigate between macro and meso institutional environments? *Strategic Entrepreneurship Journal*, 8(1), 75-94. <http://doi.org/10.1002/sej.1172>
- Dheer, R.J. 2017. Cross-national differences in entrepreneurial activity: role of culture and institutional factors. *Small Business Economics*, 48(4), 813-842. <http://doi.org/10.1007/s11187-016-9816-8>
- Eijdenberg, E.L., Thompson, N.A., Verduijn, K. and Essers, C. 2019. Entrepreneurial activities in a developing country: an institutional theory perspective. *International Journal of Entrepreneurial Behavior & Research*, 25(3) <http://doi.org/10.1108/IJEBR-12-2016-0418>
- Garcia-Cabrera, A.M., Garcia-Soto, M.G. & Dias-Furtado, J. 2018. The individual's perception of institutional environments and entrepreneurial motivation in developing economies: Evidence from Cape Verde. *South African Journal of Economic and Management Sciences*, 21(1), a2377. <https://doi.org/10.4102/sajems.v21i1.2377>
- García-Rodríguez, F.J., Gil-Soto, E., Ruiz-Rosa, I. and Gutiérrez-Taño, D. 2017. Entrepreneurial process in peripheral regions: the role of motivation and culture. *European Planning Studies*, 25(11), 2037-2056. <https://doi.org/10.1080/09654313.2016.1262827>

- Glover, J.L., Champion, D., Daniels, K.J. and Dainty, A.J. 2014. An Institutional Theory perspective on sustainable practices across the dairy supply chain. *International Journal of Production Economics*, 152, 102-111. <https://doi.org/10.1016/j.iipe.2013.12.027>
- González-Pernía, J.L., Peña-Legazkue, I. and Vendrell-Herrero, F. 2012. Innovation, entrepreneurial activity and competitiveness at a sub-national level. *Small Business Economics*, 39(3), 561-574. <http://doi.org/10.1007/s11187-011-9330-y>
- Hartanto, D., Radiman, R., and Adhani, A. 2020. Is pattern of government spending related with environmental sustainability in ASEAN countries? Role of debt servicing, development expenditure and social investment. *Journal of Security and Sustainability Issues*, 10(Oct), 139-150. [http://doi.org/10.9770/jssi.2020.10.Oct\(10\)](http://doi.org/10.9770/jssi.2020.10.Oct(10))
- Hongbo, L. and Koffi, A.L. 2019. Effect of Innovation on Small Medium Enterprises (SMEs) Performance and Competitiveness: Evidence from Cote d'Ivoire. Available at SSRN 3493412. <https://dx.doi.org/10.2139/ssrn.3493412>
- Hopp, C. and Stephan, U. 2012. The influence of socio-cultural environments on the performance of nascent entrepreneurs: Community culture, motivation, self-efficacy and start-up success. *Entrepreneurship & Regional Development*, 24(9-10), 917-945. <http://dx.doi.org/10.1080/08985626.2012.742326>
- Jennings, J.E. and Brush, C.G., 2013. Research on women entrepreneurs: challenges to (and from) the broader entrepreneurship literature?. *Academy of Management Annals*, 7(1), 663-715. <https://doi.org/10.5465/19416520.2013.782190>
- Jones, R. and Rowley, J., 2011. Entrepreneurial marketing in small businesses: A conceptual exploration. *International Small Business Journal*, 29(1), 25-36. <http://doi.org/10.1177/0266242610369743>
- Kadir, A.R.A., Aminallah, A., Ibrahim, A., Sulaiman, J., Yusoff, M.F.M., Idris, M.M., Bahar, M.R., Hasanordin, R., Rahim, S.S.A. and Abd Malek, Z. 2018. The influence of intellectual capital and corporate entrepreneurship towards small and medium enterprises' (SMEs) sustainable competitive advantage: building a conceptual framework. In Proceedings of the 2nd Advances in Business Research International Conference (pp. 67-77). https://doi.org/10.1007/978-981-10-6053-3_7
- Klammer, A., Gueldenberg, S., Kraus, S. and O'Dwyer, M. 2017. To change or not to change—antecedents and outcomes of strategic renewal in SMEs. *International Entrepreneurship and Management Journal*, 13(3), 739-756. <http://doi.org/10.1007/s11365-016-0420-9>
- Kreiser, P.M., Marino, L.D., Dickson, P. and Weaver, K.M. 2010. Cultural influences on entrepreneurial orientation: The impact of national culture on risk taking and proactiveness in SMEs. *Entrepreneurship Theory and Practice*, 34(5), 959-984. <http://doi.org/10.1111/j.1540-6520.2010.00396.x>
- Kunz, R., Mütterlein, J. and Walton, V. 2017. Organizational choices and venturing modes: An analysis of corporate venture capital activities in legacy media. *The Journal of Media Innovations*, 4(1), 26-43. <http://dx.doi.org/10.5617/jmi.v4i1.2429>
- Lortie, J., Barreto, T. and Cox, K. 2019. The implications of national and regional long-term orientation on entrepreneurial activity. *International Journal of Entrepreneurial Behavior & Research*. <http://doi.org/10.1108/IJEBR-01-2018-0026>
- Malecki, E.J., 2018. Entrepreneurship and entrepreneurial ecosystems. *Geography Compass*, 12(3), p.e12359. <https://doi.org/10.1111/gec3.12359>
- Napp, J.J. and Minshall, T. 2011. Corporate venture capital investments for enhancing innovation: Challenges and solutions. *Research-Technology Management*, 54(2), 27-36. <https://doi.org/10.5437/08953608X5402004>
- Nicotra, M., Romano, M., Del Giudice, M. and Schillaci, C.E. 2018. The causal relation between entrepreneurial ecosystem and productive entrepreneurship: A measurement framework. *The Journal of Technology Transfer*, 43(3), 640-673. <https://doi.org/10.1007/s10961-017-9628-2>
- Pérez-Pérez, M., López-Fernández, M.C. and Obeso, M. 2019. Knowledge, Renewal and Flexibility: Exploratory Research in Family Firms. *Administrative Sciences*, 9(4), 87. <http://doi.org/10.3390/admsci9040087>
- Raynor, M.E. 2012. A leader's guide to internal corporate venturing 2.0. *Strategy & Leadership*. <http://doi.org/10.1108/10878571211191657>

- Rosenbusch, N., Rauch, A. and Bausch, A. 2013. The mediating role of entrepreneurial orientation in the task environment–performance relationship: A meta-analysis. *Journal of Management*, 39(3), 633-659. <http://doi.org/10.1177/0149206311425612>
- Sáez-Martínez, F.J. 2011. Strategic renewal, cooperation, and performance: a contingency approach. *Journal of Management and Strategy*, 2(4), 43. <http://doi.org/10.5430/jms.v2n4p43>
- Sakhdari, K. 2016. Corporate entrepreneurship: A review and future research agenda. *Technology Innovation Management Review*, 6(8). <http://doi.org/61484c86cf85e8f7>
- Salimath, M.S. and Cullen, J.B. 2010. Formal and informal institutional effects on entrepreneurship: a synthesis of nation-level research. *International Journal of Organizational Analysis*, 18(3), 358-385. <http://doi.org/10.1108/19348831011062175>
- Schmitt, A., Barker III, V.L., Raisch, S. and Whetten, D. 2016. Strategic renewal in times of environmental scarcity. *Long Range Planning*, 49(3), 361-376. <https://doi.org/10.1016/j.lrp.2015.08.004>
- Schmitt, A., Raisch, S. and Volberda, H.W. 2018. Strategic renewal: Past research, theoretical tensions and future challenges. *International Journal of Management Reviews*, 20(1), 81-98. <https://doi.org/10.1111/ijmr.12117>
- Sekaran, U. and Bougie, R. 2016. *Research methods for business: A skill building approach*. John Wiley & Sons.
- Selig, C.J. and Baltes, G.H. 2017. Clarifying the roles in corporate entrepreneurship. In *2017 International Conference on Engineering, Technology and Innovation (ICE/ITMC)* (pp. 879-887). IEEE.
- Selig, C.J. and Baltes, G.H. 2019. Towards an effective management of corporate entrepreneurship activities. In *2019 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)* (pp. 1-9). IEEE. <http://doi.org/10.1109/ICE.2019.8792638>
- Selig, C.J., Gasser, T. and Baltes, G.H. 2018. How corporate accelerators foster organizational transformation: An internal perspective. In *2018 IEEE international conference on engineering, technology and innovation (ICE/ITMC)* (pp. 1-9). IEEE. [http://doi.org/978-1-5386-1469-3/18/\\$31.00](http://doi.org/978-1-5386-1469-3/18/$31.00)
- Shinnar, R.S., Giacomini, O. and Janssen, F. 2012. Entrepreneurial perceptions and intentions: The role of gender and culture. *Entrepreneurship Theory and Practice*, 36(3), 465-493. <http://doi.org/10.1111/j.1540-6520.2012.00509.x>
- Sievinen, H.M., Ikäheimonen, T. and Pihkala, T., 2019. Strategic renewal in a mature family-owned company—A resource role of the owners. *Long Range Planning*, 53(2), 101864 <https://doi.org/10.1016/j.lrp.2019.01.001>
- Sine, W.D. and David, R.J., 2010. Institutions and entrepreneurship. In *Institutions and Entrepreneurship* (pp. 1-26). Emerald Group Publishing Limited, [http://doi.org/10.1108/S0277-2833\(2010\)0000021005](http://doi.org/10.1108/S0277-2833(2010)0000021005)
- Sosna, M., Treviño-Rodríguez, R.N. and Velamuri, S.R., 2010. Business model innovation through trial-and-error learning: The Naturhouse case. *Long Range Planning*, 43(2-3), 383-407. <https://doi.org/10.1016/j.lrp.2010.02.003>
- Stewart, S.A. 2014. A Foot in Both Camps: The Influence of Role Identity Centrality. *International Journal of Qualitative Studies in Education*, 32(4), 429-445. <https://doi.org/10.1080/09518398.2019.1597212>
- Su, J., Zhai, Q., and Karlsson, T. 2017. Beyond red tape and fools: Institutional theory in entrepreneurship research, 1992–2014. *Entrepreneurship Theory and Practice*, 41(4), 505-531. <http://doi.org/10.1111/etap.12218>
- Sulasmí, E., Agussani, and Tanjung, H. (2020). Bridging the way towards sustainability performance through safety, empowerment and learning: using sustainable leadership as driving force. *Journal of Security and Sustainability Issues*, 10(Oct), 93-107. [http://doi.org/10.9770/jssi.2020.10.Oct\(7\)](http://doi.org/10.9770/jssi.2020.10.Oct(7))
- Szyliowicz, D. and Galvin, T. 2010. Applying broader strokes: Extending institutional perspectives and agendas for international entrepreneurship research. *International Business Review*, 19(4), 317-332. <https://doi.org/10.1016/j.ibusrev.2010.01.002>
- Terjesen, S., Bosma, N. and Stam, E. 2016. Advancing public policy for high-growth, female, and social entrepreneurs. *Public Administration Review*, 76(2), 230-239. <http://doi.org/10.1111/puar.12472>

Thornton, P.H., Ribeiro-Soriano, D. and Urbano, D. 2011. Socio-cultural factors and entrepreneurial activity: An overview. *International Small Business Journal*, 29(2), 105-118. <http://doi.org/10.1177/0266242610391930>

Tolbert, P.S., David, R.J. and Sine, W.D. 2011. Studying choice and change: The intersection of institutional theory and entrepreneurship research. *Organization Science*, 22(5), 1332-1344. <https://doi.org/10.1287/orsc.1100.0601>

Urbano, D., Aparicio, S. and Audretsch, D. 2019. Twenty-five years of research on institutions, entrepreneurship, and economic growth: what has been learned? *Small Business Economics*, 53(1), 21-49. <https://doi.org/10.1007/s11187-018-0038-0>

Valliere, D. 2017. Belief patterns of entrepreneurship: exploring cross-cultural logics. *International Journal of Entrepreneurial Behavior & Research*, 23(2) <http://doi.org/10.1108/IJEBR-12-2015-0297>

Wambugu, L., 2014. Effects of Organizational Culture on Employee Performance (Case Study of Wartsila-Kipevu Ii Power Plant). *European Journal of Business and Management*, 6(32).

Welter, F. and Xheneti, M. 2015. Value for Whom? Exploring the Value of Informal Entrepreneurial Activities in Post-Socialist Contexts. Exploring Criminal and Illegal Enterprise: New Perspectives on Research. *Policy & Practice*, 5, 253-275. <https://doi.org/10.1108/S2040-724620150000005016>

Yousafzai, S.Y., Saeed, S. and Muffatto, M. 2015. Institutional theory and contextual embeddedness of women's entrepreneurial leadership: Evidence from 92 countries. *Journal of Small Business Management*, 53(3), 587-604. <http://doi.org/10.1111/jsbm.12179>

Zucchella, A. and Magnani, G., 2016. *International entrepreneurship: theoretical foundations and practices*. Springer. <http://doi.org/10.1057/9781137520036>

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LONGITUDINAL RESEARCH - ENTREPRENEURIAL ORIENTATION IMPACT, INNOVATIVENESS, AND BUSINESS PERFORMANCE IN CROATIAN COMPANIES

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Abstract. The research explores whether there were changes in the model of the impact that entrepreneurial orientation (EO) had on innovativeness and business performance in Croatian companies, in the 2016-2019 period. To analyse data, we used regression and covariance analysis. The results reveal that the impact of entrepreneurial orientation and proactiveness on innovativeness and business performance did not show a significant statistical change between the years 2016 and 2019 in Croatian companies. However, the impact of risk-taking on innovativeness showed a statistically significant change. The change in the impact of risk-taking on business performance, and the change in the impact that autonomy had on innovativeness and business performance, could not be statistically reliably established. The results can benefit companies to better understand the entrepreneurial orientation and thus to increase the level of innovativeness in their operations. In the long run, this leads to the market competitiveness of their company. The results also contribute to the development of scientific thoughts about entrepreneurial success as the ultimate goal of entrepreneurship. Besides its contribution to the research of entrepreneurship, this article has meaningful implications for policy-makers and managers.

Keywords: innovativeness, entrepreneurial orientation, risk-taking, proactiveness, Croatian companies

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JEL Classifications: L26, O31, F1

1. Introduction

In the past three decades, the interest of scientists in studying companies' innovativeness has surged. This is the result of academic research in various concepts of strategic orientations of companies that affect their innovativeness and business performance. The reasons for this specific interest can be found in "The Schumpeterian approach theory", widely seen within the research of entrepreneurship (Schumpeter 1934;

Carlsson et al. 2013; Acs et al. 2013). This approach offers an evolutionary perspective that combines knowledge, entrepreneurship as a process, and regional transformation through time (Henning, McKelvey 2020; Malerba, McKelvey 2020). Acs (2006) states that Schumpeter's idea depends on long-term economic growth and its ability to use innovation. Baumol (1990) differentiates productive, unproductive, and destructive entrepreneurship. Desai et al. (2013) state that this division has important implications especially for countries that are still recovering from wars and other conflicts. Productive entrepreneurship refers to entrepreneurial activities that create economic value and can vary depending on the productivity of the entrepreneur and on the institutions which impact the entire economy. Unproductive entrepreneurship involves activities that redistribute the existing rents, annuities, tax evasion, etc. Various studies analyze the difference between productive and unproductive entrepreneurship (Sobel 2008; Herrmann, 2019). Destructive entrepreneurship is “a discovery of a previously unused legal gambit that is effective in diverting rents to those who are first in exploiting it.” (Baumol 1990, p. 897). Desai et al. (2013) define destructive entrepreneurship as the one which is destroying wealth. They suggest a development model of destructive entrepreneurship and make assumptions about the nature and behavior of entrepreneurial talent.

On the one hand, entrepreneurship is related to economic growth, innovation, employment, and productivity (Acs 2006). On the other, a series of studies have confirmed that the ownership of companies does not necessarily stimulate economic growth (Audretsch, Thurik 2001; Hessels et al. 2008). Luu & Ngo (2019) claim that the entrepreneurial constructs are applicable in various cultural contexts, particularly in transition economies. Moreover, entrepreneurial orientation (EO) has successfully been applied in different types of organizations, including state-owned companies (Tremml, 2019). Various studies have examined how institutions affect entrepreneurship and the results indicate that public institutions are important for the growth of entrepreneurial ventures (Bjørnskov, Foss 2013; Herrmann, 2019). The dynamics of entrepreneurship development differs depending on institutional context and on the level of economic development of industrial sectors in a country (Acs et al. 2008). Studies have also shown that economic, cultural, and historical outcomes have a significant impact on entrepreneurial activity and risk-taking (Grilo, Thurik 2005). Entrepreneurial orientation has been well explored in industrialized Western business environments (Lumpkin, Dess 2001; Bernoster et al. 2020), while in the non-Western context their applicability has not been adequately researched (Killa, 2014; Ejdy, 2016; Głodowska et al. 2019; Raats, Krakauer, 2020). Using a sample of Chinese companies Wong (2012) proves that entrepreneurial orientation positively affects the success of new products. Killa (2014) confirmed the impact of entrepreneurial orientation, innovativeness, product innovation, and value creation on the marketing performance of companies in Indonesia. Ejdy (2016) confirms the positive relationship between entrepreneurial orientation and innovativeness in companies in the Poleskie Region. Several scientists have explained the role of entrepreneurial orientation in the process of developing innovations, finding that it affects business performance in a certain country (Presutti et al. 2017; Presutti, Odorici 2019).

The research question is posed here: 1. What type of impact does entrepreneurial orientation exert on innovativeness and performance in Croatian companies, and how much has it changed in the two examined time periods? Croatia is a small country with an open market. These circumstances require longitudinal research, as well as the comparison of the results of the 2016 and the 2019 research, to ascertain whether there are changes in the impact of entrepreneurial orientation on innovativeness and business performance. This research has embraced the approach advocated by Oslo Manual (2005) who used a 3-year time frame to understand the changes in innovation developments. Given that innovativeness is a time-consuming process, rarely completed within one financial year, the longitudinal research offers a better insight into the innovation activities within a company than a one-year approach. The focus of this analysis is on different types of innovativeness that companies implement for products, processes, and systems (Nybak, 2012).

The stagnation of the Croatian economy began in the 1980s due to the crisis of the political and economic system at the time. Privatization was initiated in the 1990s albeit in the unfavorable circumstances of the war. The real aim of privatization was not achieved since state assets were not managed by productive entrepreneurs. The collapse of the system ensued with a sharp decline in production, exporting, employment, consumption, and the standard of living. The previous system of workers' self-management was very soon transformed into "wild capitalism". Monetary politics based on a more or less fixed exchange rate was supposed to create a framework for the restructuring of companies. Unfortunately, it ended up being a limiting factor in the transition of the Croatian economy, present until today. This type of politics has brought uneven growth and development of an economic model based on trade, imports, and consumption, which is not stimulating for the development of entrepreneurship. Large companies generate most of their income in the domestic market, which is the consequence of the economic and political system, and not primarily of the result of able entrepreneurs. This destructive process was successfully going on at a time when the strategic goal of other transition countries in Eastern and Central Europe was the one of increasing domestic production and employment.

The beginning of the global crisis in 2008 produced different trends, two of which are particularly important: the continuation of the country's indebtedness, and the limitations arising from the structure of investments. In that period the state played the role of the main entrepreneur, so the infrastructure and nonproductive capacities saw the largest amount of investment, while too little was invested in production capacities. However, the new traffic infrastructure was beneficial for tourism development. The Global Entrepreneurship Monitor (GEM) report published in 2018 revealed that the level of entrepreneurship in Croatia was still low in comparison to the average level in Europe (Singer et al. 2018). Croatia joined the European Union in 2013 as the 28th member-state. After the accession, the exports of small and medium-sized companies to the EU have grown, while the share of large companies in the total exports has decreased. Industrial production is technologically inferior and has resulted in a decline in production, employment and exports.

Croatia's accession to the European Union pulled the economy out of a prolonged recession - a positive aspect of Croatia's transitional process. However, if we examine the structural issues of the Croatian economy, the picture of entrepreneurship development looks grim. Investments in Croatia are significantly smaller than in other eurozone countries, public administration reforms are slow and the labor productivity in Croatia is below the EU average. Croatian companies are less interested in innovativeness which indicates that business systems are sluggish in using the openness of the market to find innovative solutions. The results of the Global Entrepreneurship Monitor (GEM) show that even though Croatian companies are better technologically equipped than those in the EU, and in the comparative group of countries whose economies are efficiency-driven, in terms of product innovation Croatia is lagging behind (Singer et al. 2018). These are very worrying indicators because competitiveness is achieved through innovative products and not through the technological equipment of companies. In the 2016-2018 period about 70% of TEAs and more than 75% of "growing" companies in Croatia had products that were not new to anyone (Singer, et al. 2018). If we compare Croatia to Italy, which is the second most important Croatia's foreign trade partner, Italy is better than Croatia in both categories of business ventures: TEA and mature firms. Italy had twice as many companies which produced completely new products not known before in the TEA category, and as much as 3.6 times more new products, previously unknown, produced by mature firms (Singer et.al. 2018).

The efficiency of public administration in Croatia is also below the EU average, which weakens the entrepreneurs' trust in the state government. The efficiency of the judicial system is low and Croatia is at the top of the EU in terms of unresolved court cases. Even though the public debt decreased towards the end of 2019, it was still the highest of all the countries in Central and Eastern Europe. A large part of the public debt increase has been the repercussion of the retirement reform that was introduced through the second retirement column, which has created this gap in relation to other countries. Public debt is still creating structural vulnerability of the domestic economy. These are just some of the examples of structural problems in the economy that have affected the

development of entrepreneurship. Insufficient cooperation between industry and science influences the creation of a legislative framework, and this framework is the basis for carrying out research and development projects that would increase the technological and innovative activities of companies. Most investments are based on further withdrawals from the EU cohesion funds. On top of that, in main Croatia's foreign trade partners, Germany and Italy, economic growth is expected to gradually slow down in the short term. However, despite all the negative indicators, the ruling politics in Croatia does not analyze the successes and failures of the previous policies, to use them as the basis for producing significant changes and thus help the development of entrepreneurship.

In several respects, this study contributes to the exploration of strategic orientations of company management. The impact of entrepreneurial orientation on the innovativeness and performance of Croatian companies was examined for the first time by longitudinal research in the 2016 and in 2019 research. The application of the same model, and the usage of the same sample of companies, will shed more light on the model itself. As for the applied model, the findings will show whether business success will be achieved and whether managers should take the same course of action as they did in the year 2016. We depict here entrepreneurial orientation through generic entrepreneurial experience specific to a particular industry, to better understand the role of this orientation in the development of innovative processes. Moreover, the results contribute to a deeper understanding of EO's impact on the innovativeness and performance of Croatian companies. Most research studies refer to American and West European countries, while this study provides data on a European transition country. Based on the theoretical knowledge on entrepreneurial orientation, there was a need to prove the hypothesis about the impact of entrepreneurial orientation on innovativeness and business performance of Croatian companies. This study is organized as follows: First, the literature review is given on the entrepreneurial orientation, including innovativeness and business performance. Then the description of the research methods is presented, as well as the findings of the research. Last, the conclusion is drawn with theoretical and practical implications.

2. Literature review

A one-dimensional construct for measuring EO is largely used in studies, based on what entrepreneurial companies have in common (Covin, Slevin 1989); while a multi-dimensional concept explores how entrepreneurial companies can differ, and the concept is expanded with two dimensions: competitive aggressiveness and autonomy (Lumpkin, Dess 1996). Lumpkin et al. (2013) suggest that the presence of multiple stakeholders and access to funding/financing impact risk-taking, competitive aggressiveness, and autonomy. Raats & Krakauer (2020) state that it is necessary to combine the dimensions of competitive aggressiveness and autonomy for the construct of EO to exist in a dynamic environment. Several studies provide an overview of all the significant research on the concept of EO (Covin, Miller 2014; Wales, 2016). Scientists are focused on various aspects of innovativeness, such as developing business strategy and business model (Ireland et al. 2009); on new products (Rosenbusch et al. 2011); on innovation process (Perez-Luno et al., 2011); innovation performances (Alegre, Chiva 2013); types of innovation (Covin et al., 2016); innovation culture (Gupta, Gupta 2015) and the key to success in business which leads to better performance, better company's position in the market and to competitiveness (Certo et al. 2009). Such factors can encourage the efforts of entrepreneurs in overcoming many obstacles they face in developing business processes (Acs et al., 2008). Numerous studies state that innovativeness is not a uniformly identified variable, so the testing of structured models with overlapping dimensions is often proposed, for example, in the domain of International Entrepreneurial Orientation (IEO) – (Dai et al. 2014; Thanos et al. 2017; Głodowska et al. 2019; Raats, Krakauer 2020); or testing with mutually exclusive constructs (Covin, Miller 2014). Finally, there are cases where the relevant forms of innovativeness have been limited to those connected with the new inputs in the fields of technology, business models, products, services or markets (Covin, Wales 2019).

It seems appropriate to ask a question now whether it is acceptable to combine the dimensions of entrepreneurial orientations in different ways. Many authors argue that theoretically defined dimensions of entrepreneurial orientation can be combined since they constitute a collective “catchcall” (Miller, 2011; Covin, Lumpkin 2011). Different combinations of the EO dimensions have been researched in numerous studies (Rauch et al. 2009; Wales et al. 2015; Wales, 2016). Miller (2011) encourages researchers to extend the theoretical reach by applying the models which use a taxonomy of variables related to strategic, organizational, leadership, cultural, and environmental variables. Numerous discussions have been opened up about the nature of the concept and the difference between the reflecting and formative model of EO in different contexts (George, Marino 2011). Covin & Wales (2012) study these problems and favor the reflective model for measuring the EO dimensions. On the other hand, Anderson et al. (2015) use the formative model. It can also be argued that the EO scale was developed and used primarily for companies and therefore such measurement scales have limited application in other organizational contexts, due to differences in set goals, management structure, etc. For example, in the public and private sector (Zahra et al. 2014; Khanagha et al. 2017); in education (Todorovic et al. 2011; Ismail et al. 2015; Diáñez –González, Camelo-Ordaz 2017); and in international business (Thanos et al. 2017).

Although there is a large body of literature on conceptualizing and measuring entrepreneurial orientation, and discussions are often initiated on the subject, there is actually a small number of high value-added studies (Covin, Wales 2019). Therefore it is necessary to continue the research and add value to the concept of entrepreneurial orientation. Scientists have obtained mixed results in comparing EO and performance. However, in most studies, they have proved the existence of a positive and strong relationship between the two, in various economic contexts (Khedhaouria et al. 2015; Guzmán et al. 2020). Entrepreneurial orientation is an important factor in entrepreneurial success, which is the ultimate goal of entrepreneurship (Bernoster et al. 2020). The relationship between entrepreneurial orientation (EO) and business performance is one of the most researched subjects in entrepreneurship (Wiklund, Shepherd 2011). Several studies indicate that dynamic effects of EO on the business operations of a company can be caused by internal elements, such as the level of entrepreneurial experience, limited resources, and company size, as well as by external elements, such as inter-organizational networks, environmental protection, etc. (Presutti et al., 2017). In the study by Presutti & Odorici (2019), the results measured in 2005 and in 2016 indicate that previous entrepreneurial experience, when specific, can increase the effect of entrepreneurial and market orientation on the growth of business performance in small and medium-size Italian IT firms. Wales (2016) states that many researchers have already suggested there should be further quality research on the topic of EO (Miller, 2011; Wiklund, Shepherd 2011; Covin, Miller 2014).

Based on the defined objective, this research tested the following hypothesis:

H1: Entrepreneurial orientation positively and directly impacts innovativeness and business performance, and this impact was not significantly changed in the 2019 model, in relation to the 2016.

3. Research methodology

The main goals of the 2019 research were based on the identical model, hypotheses, and the identical survey questionnaire as those in the 2016 research, so that the data collected in both research studies are compatible and suitable for comparison. The results of the first collected set of data from the 2016 research were published in the paper (Šlogar, Bezić 2020). The model applied includes entrepreneurial orientation as an independent variable, which includes three dimensions: proactivity, risk-taking inclination (Covin, Slevin 1989); and the level of autonomy in Croatian companies (Lumpkin, Dess 1996). A Likert scale with rating scales ranging from 1 to 5 was used. Dependent variables include innovativeness with three dimensions: product innovations, process innovativeness, and business system innovativeness (Nybakk 2012); and business performance with quantitative and qualitative effects. The Likert five-point scale (1-5) is also used for rating. The information was collected via e-mails sent to 900 Croatian companies that were actively operating and were registered in the Register of Business entities of the Croatian Chamber of Commerce. For the longitudinal survey, only a sub-sample of companies that participated in both surveys was selected. Finally, 101 company was included, from 303 companies which participated in the 2016 survey; and 101 company, of all 158 respondents, from the 2019 survey. The questionnaire was created in online Google Docs which simplifies filling it out and submitting it, in order to get the largest possible number of respondents. The data for the two research studies were gathered online in two periods: the first set of data from October till December 2016, whilst the second one was from October 2019 till January 2020.

The needed size of a representative sample was determined by using the Power Analysis method. It found that the sample of 101 companies, with 95% reliability and 90% of the power test, with a correlation coefficient bigger than 0,30, will give statistically significant results. This is the expected correlation between dependent and independent variables, established based on the 2016 research. Thus we can state that the sample of 101 companies will provide statistically reliable results. The gathered data were first analyzed by descriptive statistics in order to check whether the values of the independent and dependent variables followed the normal distribution. If the mean value does not deviate significantly from the median value, it can be concluded that there is no significant deviation from the normal distribution. Therefore, for further statistical analysis, parametric methods, regression analysis, and covariance analysis were used. The regression analysis checked whether there was a statistically significant influence between independent and dependent variables in 2016 and 2019. Statistically significant regression lines are a prerequisite for applying a covariance analysis. The covariance analysis tests the difference between the regression lines from 2016 and 2019, i.e. it tests the difference between the inclination of the lines and the sections of the lines. If the inclination and sections of the lines are approximately equal, the lines will be parallel and close to one another, which means that there is no significant difference between these lines, and thus there is no actual difference between the mutual influence of independent and dependent variables in 2016 and 2019. The result of the analysis of covariance is statistically reliable if the inclination of the regression lines is statistically significant, so with 95% reliability it can be stated that the regression line has exactly the depicted inclination and section. If the regression line is not statistically significant, then this can not be confirmed. That is why unreliable cases will be commented in the regression analysis before performing the covariance analysis (ANCOVA), and the covariance analysis will be conducted only for reliable cases, for the 2016-2019 period.

4. Research results

In this chapter, the analysis of the survey results will be presented. Complex data will be analyzed with a table or graph.

Table 1. Descriptive statistics of variables included in the 2016 and 2019 model

2016	N	Mean	Median	Minimum	Maximum	Std.Dev.
Entrepreneurial orientation	101	86.3	86.0	64	113	11.86
Proactiveness	101	19.2	20.0	9	25	4.43
Risk-taking	101	17.5	17.0	12	24	2.86
Autonomy	101	15.0	15.0	7	23	2.98
Innovativeness	101	56.9	57.0	25	79	11.93
Product innovation	101	20.9	22.0	6	30	5.36
Process innovativeness	101	14.4	15.0	4	20	3.95
Business system innovativeness	101	17.4	17.0	11	24	3.61
Business performance	101	59.3	58.0	39	77	9.03
Business performance- Quantitative effects	101	23.6	23.0	12	33	4.27
Business performance- Qualitative effects	101	31.8	32.0	20	45	5.41
2019	N	Mean	Median	Minimum	Maximum	Std.Dev.
Entrepreneurial orientation	101	86.7	90.0	41	104	11.16
Proactiveness	101	19.9	20.0	5	25	4.22
Risk-taking	101	16.7	17.0	5	24	2.58
Autonomy	101	13.9	14.0	5	20	2.78
Innovativeness	101	59.7	60.0	27	80	13.36
Product innovation	101	22.6	23.0	6	30	5.92
Process innovativeness	101	14.8	16.0	6	20	4.11
Business system innovativeness	101	18.5	19.0	9	25	4.23
Business performance	101	61.5	61.0	44	80	9.67
Business performance- Quantitative effects	101	24.0	24.0	16	31	3.85
Business performance- Qualitative effects	101	33.7	33.0	22	45	6.18

Source: Author

Table 1. Descriptive statistics show that there is no significant difference between the arithmetic middle (Mean) and the median value (Median), which means that the values of the variables do not deviate significantly from the normal distribution. Although it is justified to apply regression analysis and covariance analysis in further statistical processing, it can be seen that the values of the statistical indicators from 2016 and 2019 do not differ, which indicates that no significant changes in the model are expected from 2016 till 2019.

Table 2. Regression Analysis - Impact of independent variables in 2016 and 2019.

Dependent Variable: Innovativeness								
Independent variable	2016				2019			
	R	SE	F(1.99)	p	R	SE	F(1.99)	p
Entrepreneurial orientation	0.751	0.065	132.957	<0.001	0.670	0.075	80.494	<0.001
Proactiveness	0.747	0.066	129.661	<0.001	0.720	0.070	106.849	<0.001
Risk-taking	0.356	0.092	14.994	<0.001	0.230	0.098	5.507	0.021
Autonomy	0.337	0.093	13.161	<0.001	-0.079	0.100	0.616	0.434
Dependent Variable: Product innovation								
Independent variable	2016				2019			
	R	SE	F (1.99)	p	R	SE	F(1.99)	p
Entrepreneurial orientation	0.679	0.074	84.726	<0.001	0.659	0.076	75.960	<0.001
Proactiveness	0.652	0.076	73.120	<0.001	0.702	0.072	96.249	<0.001
Risk-taking	0.330	0.095	12.131	0.001	0.260	0.097	7.151	0.009
Autonomy	0.381	0.093	16.800	<0.001	-0.037	0.100	0.133	0.716
Dependent Variable: Process innovativeness								
Independent variable	2016				2019			
	R	SE	F (1.99)	p	R	SE	F(1.99)	p
Entrepreneurial orientation	0.643	0.077	69.688	<0.001	0.547	0.084	42.327	<0.001
Proactiveness	0.587	0.081	51.925	<0.001	0.587	0.081	52.109	<0.001
Risk-taking	0.427	0.091	22.096	<0.001	0.173	0.099	3.039	0.084
Autonomy	0.355	0.094	14.241	<0.001	-0.094	0.100	0.882	0.350
Dependent Variable: Business system innovativeness								
Independent variable	2016				2019			
	R	SE	F (1.99)	p	R	SE	F(1.99)	p
Entrepreneurial orientation	0.537	0.085	40.217	<0.001	0.660	0.076	76.250	<0.001
Proactiveness	0.584	0.082	51.218	<0.001	0.722	0.070	107.662	<0.001
Risk-taking	0.217	0.098	4.887	0.029	0.192	0.099	3.778	0.055
Autonomy	0.175	0.099	3.140	0.079	-0.069	0.100	0.471	0.494

Source: Author

Table 2. depicts the results of the regression analysis. The results indicate that in 2016 the entrepreneurial orientation, together with all its dimensions: proactiveness, risk-taking, and autonomy had a statistically significant impact ($p < 0,001$) on company innovativeness, product innovation, and process innovativeness. The autonomy dimension did not have a statistically significant impact on business systems innovativeness ($p > 0,05$). Risk-taking had a slightly weaker impact on the business system innovativeness, but the impact is statistically significant ($p < 0,05$). It is also shown that in the year 2019 the company innovativeness, as well as its dimensions were statistically significantly positively influenced by entrepreneurial orientation and proactiveness ($p < 0.001$). Risk-taking positively influenced innovativeness and product innovation ($p < 0,05$), while, on the other hand, it did not have a statistically significant impact on process innovativeness and business system innovativeness ($p > 0,05$).

Table 3. Impact of independent variables on business performance in 2016 and 2019

Dependent Variable: Business performance								
Independent variable	2016				2019			
	R	SE	F(1.99)	p	R	SE	F(1.99)	p
Entrepreneurial orientation	0.700	0.070	98.692	<0.001	0.543	0.084	41.488	<0.001
Proactiveness	0.720	0.068	110.736	<0.001	0.608	0.080	59.952	<0.001
Risk-taking	0.391	0.091	18.565	<0.001	0.082	0.100	0.666	0.416
Autonomy	0.331	0.093	12.693	<0.001	-0.177	0.099	3.195	0.077
Dependent Variable: Business performance - Quantitative effects								
Independent variable	2016				2019			
	R	SE	F (1.99)	p	R	SE	F(1.99)	p
Entrepreneurial orientation	0.475	0.088	28.804	<0.001	0.435	0.090	23.122	<0.001
Proactiveness	0.463	0.089	27.053	<0.001	0.453	0.090	25.522	<0.001
Risk-taking	0.422	0.091	21.478	<0.001	0.115	0.100	1.318	0.254
Autonomy	0.186	0.099	3.549	0.063	-0.121	0.100	1.474	0.228
Dependent Variable: Business performance - Qualitative effects								
Independent variable	2016				2019			
	R	SE	F (1.99)	p	R	SE	F(1.99)	p
Entrepreneurial orientation	0.717	0.070	104.766	<0.001	0.536	0.085	39.875	<0.001
Proactiveness	0.723	0.069	108.125	<0.001	0.629	0.078	64.853	<0.001
Risk-taking	0.353	0.094	14.079	<0.001	0.045	0.100	0.204	0.653
Autonomy	0.457	0.089	5.106	<0.001	-0.185	0.099	3.497	0.064

Source: Author

Autonomy dimension did not have a statistically significant impact on innovativeness, product innovation, process innovativeness and business system innovativeness in the year 2019 ($p > 0,05$). In these cases, where the

regression analysis showed that there is no statistically significant correlation between independent and dependent variables, no covariance analysis was performed to test the statistical difference between the regression lines in 2016 and 2019.

Table 3 shows that in 2016, entrepreneurial orientation and all three of its dimensions had a positive, statistically significant impact on business performance and its quantitative and qualitative effects ($p < 0.001$). In 2019 entrepreneurial orientation ($p < 0.001$) and its dimension of proactiveness ($p < 0.001$) had a statistically significant impact on business performance and its quantitative and qualitative effects, while, risk-taking and autonomy did not have a statistically significant impact ($p > 0.05$). As the regression analysis showed that there is no significant correlation between risk-taking, autonomy, and business performance, with its quantitative and qualitative effects, no covariance analysis was performed to test the statistical difference between the regression lines in 2016 and 2019.

Table 4. Analysis of Covariance (ANCOVA) Comparison of the impact of independent variables on innovation in 2016 and 2019

Effect 2016 vs 2019	Innovativeness		Product innovation		Process innovativeness		Business system innovativeness	
	F	p	F	p	F	p	F	p
Entrepreneurial orientation	3.674	0.057	6.257	0.013	0.295	0.588	5.183	0.024
Proactiveness	1.233	0.268	3.111	0.079	0.003	0.958	2.770	0.098
Risk-taking	5.035	0.026	8.249	0.005	/	/	/	/
Autonomy	/	/	/	/	/	/	/	/

Source: Author

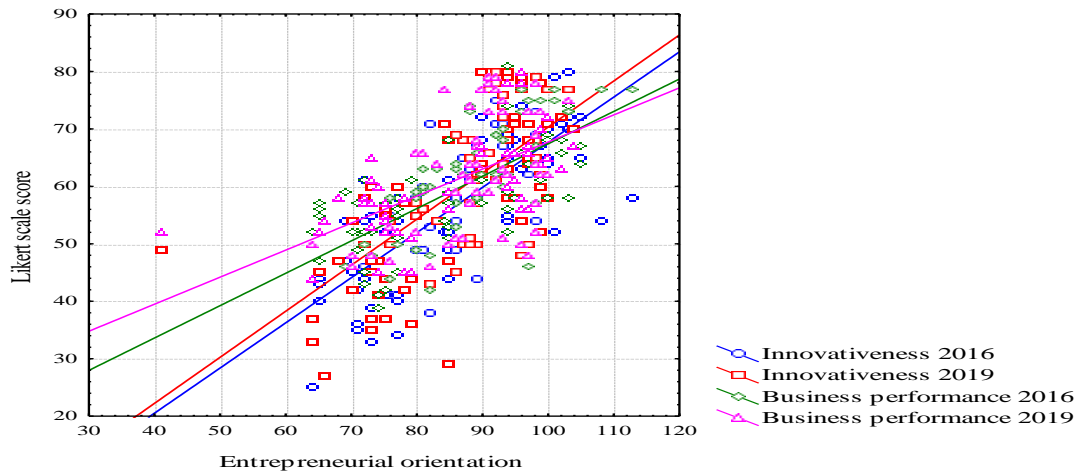
Table 4 shows the results of covariance analysis which tested the statistical difference between the regression lines of all pairs of independent and dependent variables in 2016 and 2019. Covariance analysis shows that there is no statistically significant difference between the impact of entrepreneurial orientation on innovativeness in 2016 and 2019 ($p > 0.05$). Furthermore, it is shown that there is no statistically significant difference between the impact of entrepreneurial orientation and proactiveness on company innovativeness in 2016 and 2019 ($p > 0.05$). There is a statistically significant difference between the impact of risk-taking on the company innovativeness in 2016 and 2019 ($p < 0.05$). The given results reveal there is no difference between the impact of proactiveness on product innovation in 2016 and in 2019 ($p > 0.05$). Furthermore, there is a statistically significant difference between the impact of entrepreneurial orientation and risk-taking on product innovation in 2016 and 2019 ($p < 0.05$). No statistically significant difference was found between company orientation and proactiveness on process innovativeness in 2016 and in 2019 ($p > 0.05$). The covariance analysis shows that there is no statistically significant difference between the impact of proactiveness on business system innovativeness in 2016 and in 2019 ($p > 0.05$). There is a statistically significant difference between the impact of entrepreneurial orientation on business system innovativeness in 2016 and in 2019 ($p < 0.05$).

Table 5. Comparison of the impact of independent variables on business performance in 2016 and 2019

Effect 2016 vs 2019	Business performance		Business performance- Quantitative effects		Process Innovativeness Qualitative effects	
	F	p	F	p	F	p
Entrepreneurial orientation	2.232	0.137	0.186	0.667	6.707	0.010
Proactiveness	1.233	0.268	0.000	0.995	3.842	0.051
Risk-taking	/	/	/	/	/	/
Autonomy	/	/	/	/	/	/

Source: Author

Table 5 presents the results of covariance analysis which tested the statistical difference between the regression lines of individual independent variables and business performance in 2016 and in 2019. The covariance analysis result is reliable if both regression lines show a statistically significant connection between an independent variable and business performance. This condition is not met in the case of risk-taking and business performance, and in the case of autonomy and business performance, so the covariance analysis was not performed here. The covariance analysis shows there is no statistically significant difference between the impact of entrepreneurial orientation on business performance, and between the impact of proactiveness on business performance in 2016 and in 2019 ($p > 0.05$). It also shows there is no statistically significant difference between the impact of entrepreneurial orientation on the quantitative effects of business performance and between the impact of proactiveness on the quantitative effects of business performance in 2016 and in 2019 ($p > 0.05$). The covariance analysis reveals there is a significant statistical difference between the impact of entrepreneurial orientation on the qualitative effects of business performance in 2016 ($p < 0.05$), while there is no statistically significant difference between the impact of proactiveness on the qualitative effects of business performance in 2016 and in 2019 ($p > 0.05$).



Graph 1. The impact of entrepreneurial orientation on innovativeness and business performance

Source: Author

Graph 1 presents the score of the answers about the impact of entrepreneurial orientation on innovativeness, and it was somewhat higher in 2019 than it was in the 2016 research, while the regression lines are almost parallel, which means that the level of dependency remained unchanged. The answers about the impact of entrepreneurial orientation on business performance in 2019 show that there are more answers with the lower score; that the intersection of lines is at around 90, which means that there is roughly an equal number of scores at around 90, both in the 2016 and 2019 research; while the scores above 90 prevail in the 2016 research.

Following the given results, we can confirm hypothesis H: Entrepreneurial orientation positively and directly impacts innovativeness and business performance, and this impact was not significantly changed in the 2019, in relation to the 2016. More detailed analysis of the impact that segments of entrepreneurial orientation had on innovativeness, indicated that all three segments of entrepreneurial orientation (proactiveness, risk-taking and autonomy) had a statistically significant positive impact on all segments of innovativeness (product innovativeness, process innovativeness, and business system innovativeness) in 2016 and in 2019. The exception is autonomy in 2019, where there was no significant impact of autonomy on other innovativeness segments. Similarly, a statistically significant positive impact of all segments of entrepreneurial orientation and of quantitative and qualitative effects of business performance was identified in both years, with the exception of autonomy in 2019, where no significant impact was found on business performance.

5. Conclusions

Croatian economy has been stagnating and a large number of companies that were included in the 2016 research have ceased to exist. Statistical analysis could not reliably present the impact of risk-taking on business performance, neither the impact of autonomy on innovativeness and business performance, and that is the difference between the 2016 and the 2019 research. This study expands on the previous findings and offers a theoretical contribution, with a series of management implications. Highly educated labor is crucial for the development of autonomy and hence for the development of innovativeness in companies. Long-term cooperation between companies and their stakeholders, promoted by the system of corporate management, furthers the autonomy and risk-taking in producing sophisticated high-quality products. There are several important implications of this research for entrepreneurs, which suggest the development of autonomy in companies. The research indicates that entrepreneurs have no risk propensity, they are not willing to take risks in order to bring prosperity to the company. Nevertheless, entrepreneurs are faced with a dynamic market and have to take significant risks, particularly in trying to increase exports into the international market. Risk-taking also prompts entrepreneurs to cooperate with outside stakeholders in realizing new business opportunities on the market.

The research has two main findings. Firstly, entrepreneurial orientation positively and directly impacted innovativeness and business performance, and secondly, this impact was not significantly changed in the 2019 in relation to 2016. Positive and statistically significant impact was identified on all segments of entrepreneurial orientation (proactiveness, risk-taking, and autonomy); on innovativeness (product innovativeness, process innovativeness, and business system innovativeness; and on business performance (quantitative and qualitative effects) in both 2016 and 2019. The only exception was that no significant impact was found on autonomy and on any other innovativeness segment or business performance in the year 2019.

There are, however, some important limitations of this empirical research. Its results can be considered relevant only for the companies included in this research and can not be generalized for all companies. Hence these limitations refer only to the Croatian companies in the sample. The data was collected during 2016 and 2019, so the variables and the results are limited to these two points in time. The research was carried out in the period in which the Croatian economy was slowly coming out of the crisis, and these circumstances certainly influenced

some of the answers to the questionnaire. Furthermore, the applied methodology in the research can also be considered a limitation, since not all the factors were included, e.g. quality factor, research and development factors, etc. However, despite these empirical limitations of the research, the validity of the theory has been confirmed. The empirical contribution has been achieved by defining the impact of entrepreneurial orientation on the innovativeness and business performance of a company. The conclusions of both theoretical and empirical research testify to the importance of entrepreneurial orientation and innovativeness in creating the value and solutions which would foster the development of companies and the entire economy. To boost their business performance, companies should enhance their proactiveness and autonomy within the organization, take more risks and venture into innovative projects, to improve their competitive advantage on the market. The results of the research confirm that entrepreneurial orientation is a major vehicle of an innovative company. Future research should use a larger sample of companies, in more than one country, to identify similarities and differences in the relations between entrepreneurial orientation, innovativeness, and business performance of a company. The statistical set in this research did not include micro-enterprises, so a part of the future research could also contrast entrepreneurial orientation, innovativeness, and business performance in micro-enterprises as opposed to bigger companies, in several countries.

References

- Acs, Z. J. (2006). How is entrepreneurship good for economic growth? *Innovations Technology, Governance, Globalization*, 1(1), 97–107. <https://doi.org/10.1162/itgg.2006.1.1.97>
- Acs, Z. J., Audretsch, D. B., & Lehmann, E. E. (2013). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, 41(4), 757–774. <https://doi.org/10.1007/s11187-013-9505-9>
- Acs, Z. J., Desai, S. & Hessels, J. (2008). Entrepreneurship, economic development and institutions. *Small Business Economics*, 31 (3), 219–234. <https://doi.org/10.1007/s11187-008-9135-9>
- Alegre, J., & Chiva, R. (2013). Linking Entrepreneurial Orientation and Firm Performance: The Role of Organizational Learning Capability and Innovation Performance. *Journal of Small Business Management*, 51(4), 491–507. <https://doi.org/10.1111/jsbm.12005>
- Anderson, B. S., Kreiser, P. M., Kuratko, D. F., Hornsby, J. S., & Eshima, Y. (2015). Reconceptualizing entrepreneurial orientation. *Strategic Management Journal*, 36 (10), 1579–1596. <https://doi.org/10.1002/smj.2298>
- Audretsch, D. B., & Thurik, A. R. (2001). What's new about the new economy? Sources of Growth in the Managed and Entrepreneurial Economies. *Industrial and Corporate Change*, 10(1), 267–315. <https://doi.org/10.1093/icc/10.1.267>
- Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5, Part 1), 893–921. <https://doi.org/10.1086/261712>
- Bernoster, I., Mukerjee, J., & Thurik, R. (2020). The role of affect in entrepreneurial orientation. *Small Business Economics*, 54(1) 235–256. <https://doi.org/10.1007/s11187-018-0116-3>
- Bjørnskov, C., & Foss, N. J. (2013). How strategic entrepreneurship and the institutional context drive economic growth. *Strategic Entrepreneurship Journal*, 7(1), 50–69. <https://doi.org/10.1002/sej.1148>
- Carlsson, B., Braunerhjelm, P., McKelvey, M., Olofsson, C., Persson, L., & Ylinenpää, H. (2013). The evolving domain of entrepreneurship research. *Small Business Economics*, 41(4), 913–930. <https://doi.org/10.1007/s11187-013-9503-y>
- Certo, T.S., Moss, T. W., & Short, J. (2009). Entrepreneurial orientation: An applied perspective. *Business Horizon*, 52, 319–324. <https://doi.org/10.1016/j.bushor.2009.02.001>

- Covin, J. G., Eggers, F., Kraus, S., Cheng, C. F., & Chang, M. L. (2016). Marketing-related resources and radical innovativeness in family and non-family firms: A configurational approach. *Journal of Business Research*, 69(12), 5620–5627. <https://doi.org/10.1016/j.jbusres.2016.03.069>
- Covin, J. G., & Lumpkin, G. T. (2011). Entrepreneurial orientation theory and research: Reflections on a needed construct. *Entrepreneurship Theory and Practice*, 35(5), 855–872. <https://doi.org/10.1111/j.1540-6520.2011.00482.x>
- Covin, J. G. & Miller, D. (2014). International entrepreneurial orientation: Conceptual considerations, research themes, measurement issues, and future research directions. *Entrepreneurship Theory and Practice*, 38(1), 11–44. <https://doi.org/10.1111/etap.12027>
- Covin, J., & Slevin, D. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, 10(1), 75–87. <https://doi.org/10.1002/smj.4250100107>
- Covin, J. G., & Wales, W. J. (2012). The measurement of entrepreneurial orientation. *Entrepreneurship Theory and Practice*, 36(4), 677–702. <https://doi.org/10.1111/j.1540-6520.2010.00432.x>
- Covin, J. G. & Wales, W. J. (2019). Crafting High-Impact Entrepreneurial Orientation Research: Some Suggested Guidelines. *Entrepreneurship Theory and Practice*, 43 (1), 3–18. <https://doi.org/10.1177/1042258718773181>
- Dai, L., Maksimov, V., Gilbert, B.A., & Fernhaber, S. A. (2014). Entrepreneurial orientation and international scope: The differential roles of innovativeness, proactiveness, and risk-taking. *Journal of Business Venturing*, 29(4), 511–524. <https://doi.org/10.1016/j.jbusvent.2013.07.004>
- Desai, S., Acs, Z. J., & Weitzel, U. (2013). A model of destructive entrepreneurship: Insight for conflict and postconflict recovery. *Journal of Conflict Resolution*, 57(1), 20–40. <https://doi.org/10.1177/0022002712464853>
- Diáñez-González, J. P., & Camelo-Ordaz, C. (2017). The influence of the structure of social networks on academic spin-offs' entrepreneurial orientation. *Industrial Marketing Management*, 80, 84–98. <https://doi.org/10.1016/j.indmarman.2017.12.009>
- Ejdys, J. (2016). Entrepreneurial Orientation vs. Innovativeness of Small and Medium Size Enterprises. *Journal of Engineering, Project, and Production Management*, 6(1), 13–24. <https://doi.org/10.32738/jeppm.201601.0003>
- George, B. A., & Marino, L. (2011). The epistemology of entrepreneurial orientation: Conceptual formation, modeling, and operationalization. *Entrepreneurship Theory and Practice*, 35(5), 989–1024. <https://doi.org/10.1111/j.1540-6520.2011.00455.x>
- Głodowska, A., Maciejewski, M., & Wach, K. (2019). How Entrepreneurial Orientation Stimulates Different Types of Knowledge in the Internationalisation Process of Firms from Poland? *Entrepreneurial Business and Economics Review*, 7(1), 61–73. <https://doi.org/10.15678/eber.2019.070104>
- Grilo, I., & Thurik, R. (2005). Latent and actual entrepreneurship in Europe and the US: some recent developments. *The International Entrepreneurship and Management Journal*, 1(4), 441–459. <https://doi.org/10.1007/s11365-005-4772-9>
- Gupta, V.K., & Gupta, A. (2015). Relationship between Entrepreneurial Orientation and Firm Performance in Large Organizations over Time. *Journal of International Entrepreneurship*, 13(1), 7–27. <https://doi.org/10.1007/s10843-014-0138-0>
- Guzmán, C., Santos, F.J. & Barroso, M.d.I.O. (2020). Analysing the links between cooperative principles, entrepreneurial orientation and performance. *Small Business Economics*, 55(4), 1075–1089. <https://doi.org/10.1007/s11187-019-00174-5>
- Henning, M., & McKelvey, M. (2020). Knowledge, entrepreneurship and regional transformation: contributing to the Schumpeterian and evolutionary perspective on the relationships between them. *Small Business Economics*, 54(2), 495–501. <https://doi.org/10.1007/s11187-018-0030-8>
- Herrmann, A. M. (2019). A plea for varieties of entrepreneurship. *Small Business Economics*, 52(2), 331–343. <https://doi.org/10.1007/s11187-018-0093-6>
- Hessels, J., van Gelderen, M., & Thurik, R. (2008). Entrepreneurial aspirations, motivations, and their drivers. *Small Business Economics*, 31(3), 323–339. <https://doi.org/10.1007/s11187-008-9134-x>

- Ireland, R. D. Covin, J. G. & Kuratko, D. F. (2009). Conceptualizing Corporate Entrepreneurship Strategy. *Entrepreneurship Theory and Practice*, 33(1), 19–46. <https://doi.org/10.1111/j.1540-6520.2008.00279.x>
- Ismail, K., Anuar, M. A., Wan Omar, W. Z., Aziz, A. A., Seohod, K., & Akhtar, C. S. (2015). Entrepreneurial intention, entrepreneurial orientation of faculty and students towards commercialization. *Procedia-Social and Behavioral Sciences* 181, 349–355. <https://doi.org/10.1016/j.sbspro.2015.04.897>
- Khanagha, A., Dehkordi, A.M., Zali, M. R., & Hejazi, S. R. (2017). Performance implications of entrepreneurial orientation at public research and technology institutions. *Entrepreneurship and Sustainability Issues*, 4 (4), 601–610. [https://doi.org/10.9770/jesi.2017.4.4\(15\)](https://doi.org/10.9770/jesi.2017.4.4(15))
- Khedhaouria, A., Gurău, C., & Torrès, O. (2015). Creativity, self-efficacy, and small-firm performance: the mediating role of entrepreneurial orientation. *Small Business Economics*, 44, (3), 485–504. <https://doi.org/10.1007/s11187-014-9608-y>
- Killa, M.F. (2014). Effect of Entrepreneurial Innovativeness Orientation, Product Innovation, and Value Co-Creation on Marketing Performance. *Journal of Research in Marketing*, 2(3), 198–204. <https://doi.org/10.17722/jorm.v2i3.73>
- Lumpkin, G.T., & Dess, G.G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1), 135–172. <https://doi.org/10.5465/amr.1996.9602161568>
- Lumpkin, G.T., & Dess, G.G. (2001). Linking two dimensions of entrepreneurial orientation to firm performance. *Journal of Business Venturing*, 16(5), 429–451. [https://doi.org/10.1016/s0883-9026\(00\)00048-3](https://doi.org/10.1016/s0883-9026(00)00048-3)
- Lumpkin, G.T. Moss, T.W., Gras, D. M., Kato, S., & Amezcua, A. S. (2013). Entrepreneurial processes in social contexts: how are they different, if at all?. *Small Business Economics*, 40(3), 761–783. <https://doi.org/10.1007/s11187-011-9399-3>
- Luu, N. & Ngo, L. V. (2019). Entrepreneurial orientation and social ties in transitional economies. *Long Range Planning*, 52 (1), 103–116. <https://doi.org/10.1016/j.lrp.2018.04.001>
- Malerba, F., & McKelvey, M. (2020). Knowledge-intensive innovative entrepreneurship integrating Schumpeter, evolutionary economics, and innovation systems. *Small Business Economics* 54(2), 503–522. <https://doi.org/10.1007/s11187-018-0060-2>
- Miller, D. (2011) Miller (1983) Revisited: A reflection on EO research and some suggestions for the future. *Entrepreneurship Theory and Practice*, 35(5), 873–894. <https://doi.org/10.1111/j.1540-6520.2011.00457.x>
- Nybakk, E. (2012). Learning orientation, innovativeness and financial performance in traditional manufacturing firms: a higher-order structural equation model. *International Journal of Innovation Management*, 16(5), 28. <https://doi.org/10.1142/s1363919612003873>
- OECD & Eurostat (2005), Oslo Manual – Guidelines for collecting and interpreting innovation data 3rd Edition. OECD Publishing, Paris, France.
- Perez-Luno, A., Wiklund, J., & Valle Cabrera, R. (2011). The dual nature of innovative activity: How entrepreneurial orientation influences innovation generation and adoption. *Journal of Business Venturing*, 26(5), 555–571. <https://doi.org/10.1016/j.jbusvent.2010.03.001>
- Presutti, M., Boari, C., Majocchi, A., & Molina-Morales X. (2017). Distance to customers, absorptive capacity and innovation in high-tech firms: The dark face of geographical proximity. *Journal of Small Business Management*, 57(2), 343–361. <https://doi.org/10.1111/jsbm.12323>
- Presutti, M., & Odorici, V. (2019). Linking entrepreneurial and market orientation to the SME's performance growth: the moderating role of entrepreneurial experience and networks. *International Entrepreneurship and Management Journal*, 15(3), 697–720. <https://doi.org/10.1007/s11365-018-0533-4>
- Raats, R. & Krakauer, P. (2020). International Entrepreneurial Orientation: Exploring the Brazilian Context. *Entrepreneurial Business and Economics Review*, 8(1), 51–69. <https://doi.org/10.15678/eber.2020.080103>
- Rauch, A., Wiklund, J., Lumpkin, G. T., & Frese, M. (2009). Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, 33(3), 761–787. <https://doi.org/10.1111/j.1540-6520.2009.00308.x>

Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*, 26(4), 441–457. <https://doi.org/10.1016/j.jbusvent.2009.12.002>

Schumpeter, J. A. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.

Singer, S. Šarlija, N. Sanja Pfeifer, S., & Oberman Peterka, S. (2018). What makes Croatia a (non)entrepreneurial country?, Global entrepreneurship monitor Croatia, 2017, CEPOR, SMEs and Entrepreneurship Policy Center, Retrieved May 9, 2020, from <http://www.cepor.hr/wp-content/uploads/2015/03/EN-GEM-2017-za-web.pdf>

Sobel, R. S. (2008). Testing Baumol: institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*, 23(6), 641–655. <https://doi.org/10.1016/j.jbusvent.2008.01.004>

Šlogar & Bezić. (2020). The relationship between entrepreneurial orientation and innovativeness in Croatian companies. *Poslovna izvrsnost - Business excellence* 14(2), 71–87. <https://doi.org/10.22598/pi-be/2020.14.2.71>

Thanos, I. C., Dimitratos, P., & Sapouna, P. (2017). The implications of international entrepreneurial orientation, politicization, and hostility upon SME international performance. *International Small Business Journal*, 35 (4), 495–514. <https://doi.org/10.1177/0266242616641749>

Todorovic, Z.W., McNaughton, R.B., & Guild, P. (2011). ENTRE-U: An entrepreneurial orientation scale for universities. *Technovation*, 31(2-3), 128–137. <https://doi.org/10.1016/j.technovation.2010.10.009>

Tremml, T. (2019). Linking to worlds? Entrepreneurial orientation in public enterprises: a systematic review and reseacrh agenda. *Annals of Public and Cooperative Economics*, 90(1), 25–51. <https://doi.org/10.1111/apce.12214>

Wales, W., Wiklund, J., & McKelvie, A. (2015). What about new entry? Examining the theorized role of new entry in the entrepreneurial orientation–performance relationship. *International Small Business Journal Researching Entrepreneurship*, 33(4), 351–373. <https://doi.org/10.1177/0266242613506023>

Wales, W. J. (2016). Entrepreneurial orientation: A review and synthesis of promising research directions. *International Small Business Journal: Researching Entrepreneurship*, 34(1), 3–15. <https://doi.org/10.1177/0266242615613840>

Wiklund, J., & Shepherd, D. A. (2011). Where to from here? EO-as-experimentation, failure, and distribution of outcomes. *Entrepreneurship Theory and Practice*, 35(5), 925–946. <https://doi.org/10.1111/j.1540-6520.2011.00454.x>

Wong, S. K. S. (2012). The influences of entrepreneurial orientation on product advantage and new product success. *Journal of Chinese Entrepreneurship*, 4(3), 243–262. <https://doi.org/10.1108/17561391211262175>

Zahra S, A., Wright, M., & Abdelgawad S. G. (2014). Contextualization and the advancement of entrepreneurship research. *International Small Business Journal: Researching Entrepreneurship*, 32(5), 479–500. <https://doi.org/10.1177/0266242613519807>

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REVITALISATION AS A TOOL FOR THE DEVELOPMENT OF SLOW CITY (CITTASLOW)

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Abstract. Cities and regions are struggling with social, economic, ecological, and spatial problems, which often accumulate in the historical centers, industrial areas, and degraded residential housing estates. A possible solution is to implement revitalisation measures as an instrument to activate the socio-economic functions of degraded (crisis-stricken) areas. The aim of this article is to discuss the specific character of revitalisation processes in cities which are members of the Polish National Cittaslow Network, and to determine the role of revitalisation in the development of Polish slow cities as well as the extent to which this tool is used in the local and regional development policy within the Polish National Cittaslow Network. The results of the author's own study (a survey questionnaire addressed to mayors of Cittaslow cities in 2020) were presented against the background of the data on revitalisation measures taken by municipal governments, which were collected and reported by Statistics Poland. Beside individual revitalisation programs in Cittaslow member cities, there is an ongoing supralocal revitalisation program. This is an innovative approach to planning revitalisation efforts pursued simultaneously in several cities in one region. Moreover, the revitalisation measures and activation of crisis-stricken areas are pointed to as one of the major effects achieved owing to the membership in the Cittaslow network. This implicates that competition among cities in one region can evolve towards effective co-competition of cities. This transformation is important for building the resilience of slow cities, which play an increasingly growing role in the sustainable development of regions.

Keywords: revitalisation; city development; sustainable development; network of cities; Cittaslow; slow city

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JEL Classifications: O21, Q01, R51, R58

1. Introduction

The development of an international network of cities called the Cittaslow network has been gaining momentum in recent years. The ‘Cittaslow – International network of cities where living is good’ currently associates 272 cities from 30 countries. The Polish National Cittaslow Network, founded under the auspices of the Cittaslow movement, associates 34 members and is the second largest network of slow cities globally (second only to the Italian network) with regard to the number of member cities (*Cittaslow International List*, 2020, pp. 1, 7–8). By adopting the slow city development model, a city is offered a chance for a more dynamic development in line with the slow philosophy. This is especially true about smaller cities, which search for opportunities for development in the increasingly globalised world. A decision to follow the slow city model entails the need to look for such development tools which will enable a city to attain, in the best possible way, the set development goals, arising from the accepted philosophy, and which can ensure that the city’s development is sustainable; it will also contribute to the creation of a compact and resilient city, friendly to its inhabitants. Revitalisation of some (crisis-stricken) area of a city is an example of such a tool (see Brodziński & Kurowska, 2021, pp. 1–15; Farelnik *et al.*, 2020, pp. 118–135; Farelnik *et al.*, 2021, pp. 145–164).

There are few studies available today that pertain to the issue of how revitalisation can be used as a local development instrument in the entire Cittaslow network. Most research is selective in the sense of dealing with just one or a few cities which belong to the Cittaslow network. More complex revision of revitalisation processes carried out so far in the Polish Cittaslow network member cities would therefore provide important information for comparative analyses of the course of such processes among national Cittaslow networks, operating under the umbrella of the international Cittaslow association. And Poland is a valuable research object in this regard because the Polish Cittaslow network is one of the largest national networks in the world.

The purpose of the article has been to discuss the specific character of revitalisation processes in cities which are members of the Polish National Cittaslow Network, to identify the importance of revitalisation in the development of the Polish slow cities, and to determine the extent to which this tool is employed in the local development policy in the Polish National Cittaslow Network. The research object consisted of revitalisation processes in cities which are members of the Polish Cittaslow network, and the research subject was composed of 31 cities, members of the Polish National Cittaslow Network. The following research methods were employed: a critical analysis of the literature, a diagnostic survey method, and an inductive reasoning method.

The paper comprises the following parts: theoretical background, methodology, results, discussion, and conclusions. The theoretical background section describes the origin and idea of the international and national Cittaslow networks, and characterises the specific aspects of revitalisation of small cities in Poland. The next section, dedicated to methodology, discusses the research methods applied to characterise revitalisation processes occurring in the Polish Cittaslow network member cities. Afterwards, the results of the study performed to analyse the course are presented, along with the effects of revitalisation projects as well as their role in the local development policy in Cittaslow cities. The subsequent section, discussion, is where the current research outcomes are referred to studies carried out by other authors, and where certain possible applications of these results are indicated. The article ends with conclusions, including suggestions for further research.

2. Theoretical background

The origin of the International Cittaslow Network can be sought in the growing popularity of the Slow Food movement and the initiative undertaken by mayors of four small Italian cities: Bra, Greve in Chianti, Orvieto and Positano, who explored an opportunity for the development of the cities they governed in adopting such model of a city. The name Cittaslow comes from the *città* (Italian word mean ‘a city’) and the English word *slow*.

‘Cittaslow – International network of cities where living is good’ was founded in 1999 in Orvieto, Italy. The Cittaslow Association is a not-for-profit entity, and its objectives are to promote and spread the culture of good living through research, testing and the application of solutions for the city organisation. Identity, memory, environmental protection, justice, social inclusion, and community, as well as active citizenship are among the values which the association promotes. The organs of the Cittaslow Association are: International Assembly, International Coordinating Committee, International President, President Council, Board of Guarantors and, the International Scientific Committee. The association can be aided by the so-called ‘Supporters of Cittaslow’ (regions, provinces, towns, cantons, metropolises, unions of municipalities, etc.) and ‘Friends of Cittaslow’ (*Cittaslow International Charter*, 2017, p. 5, 8–11).

Cities animated by people ‘curious about time reclaimed’, rich in squares, theatres, workshops, cafes, restaurants, spiritual places, unspoilt landscapes and fascinating craftsmen, where we still appreciate the slow, benevolent succession of the seasons, with their rhythm of authentic products, respecting fine flavours and health, the spontaneity of their rituals, the fascination of living traditions. This is the joy of a slow, quiet, reflective way of life (*Cittaslow Manifesto*, 2020, p. 1).

The *European Manifest Cittaslow* (2012, pp. 1–2) emphasised that the Cittaslow safeguards the quality of life for its citizens. This is combined with devoting much attention to traditions that are linked to modern techniques. A Cittaslow city is a conscious community which appreciates its own qualities. Cittaslow invests in the awareness of its own citizens and entrepreneurs, in order to safeguard the valuable aspects of their own community. Qualities are often appreciated most when they have disappeared; a Cittaslow will prevent this from happening. A Cittaslow invests in sustainability and quality, ensures that the cultural history and community values are maintained and strengthened, promotes bioarchitecture, biological agriculture and biodiversity of the landscape, focuses on traditionally produced products, objects and crafts but also stimulates innovative techniques (supports traditional production and stimulates the development of regional products). A Cittaslow ensures the vitality of the communities and the facilities of the communities are maintained, opts for sustainable solutions – all good things are maintained and this should not have a negative effect on the development of future generations.

The Cittaslow network activity rest on five pillars (*Cittaslow – International network...*, 2019, pp. 5–6):

1. The positive side of slowness – life in accord with one’s own natural rhythm, thoughtful production, consumption, taking care of cultural heritage and social relationships;
2. Circular economy – economy in a closed circuit, taking care of natural resources, lower consumption, recycling, cooperation with entrepreneurs, and farmers in this scope;
3. Resilience – adoption of shared aims in the development of slow cities, concerning their current and future growth, which is pivotal to what their social and economic development will be like in the future (also for future generations);
4. Social justice – the right of a community to use local resources and the principles of social justice;
5. Sustainability and culture – responsible use of natural resources, taking care of cultural heritage and nurturing tradition.

Slow cities are places where citizens and local leaders pay attention to the local history and employ the distinct local context to develop their cities in better and more sustainable ways. More generally, the slow city model focuses on local distinctiveness and explicitly links the three E’s (economy, environment and equity) of sustainable urban development (Mayer & Knox, 2006, p. 322).

The Polish National Cittaslow Network is the world’s second largest network (after the Italian one) in terms of the number of member cities which have joined the international Cittaslow movement. It comprises 34 member cities, 25 of which lie in the Warmińsko-Mazurskie Voivodeship, including 4 founder cities: Biskupiec, Bisztynek, Lidzbark Warmiński, Reszel, and several others: Barczewo, Bartoszyce, Braniewo, Dobrze Miasto, Działdowo,

Gołdap, Górowo Iławeckie, Jeziorany, Lidzbark, Lubawa, Morąg, Nidzica, Nowe Miasto Lubawskie, Olecko, Olsztynek, Orneta, Pasym, Ryn, Sępólno, Szczytno, and Wydminy. There are 2 cities from the Opolskie Voivodeship (Głubczyce, Prudnik); 1 city from each of the following voivodeships: Mazowieckie (Sierpc), Pomorskie (Nowy Dwór Gdański), Lubelskie (Rejowiec Fabryczny), Łódzkie (Rzgów), Śląskie (Kalety), Wielkopolskie (Murowana Goślina) and Zachodnio-pomorskie (Sianów). The supporting member of the Polish Cittaslow Network is the Marshal's Office of the Warmińsko-Mazurskie Voivodeship (Government of the Warmian-Masurian Voivodeship). In 2019, the Olsztyn County joined the group of supporting members. The first 'Cittaslow Friend' in Poland is the Grupa Meblowa Szynaka, operating in the towns of Cittaslow – Lubawa, Lidzbark and Nowe Miasto Lubawskie.

The Cittaslow cities employ a variety of tools in order to shape conditions for their development according to the guidelines of the slow city model. An example of such an instrument is planned and targeted revitalisation of the part of a city which, following a complex diagnosis covering social, economic and spatial spheres, has been recognised as being in need for intervention and activation. It seems that such intervention and activation should evolve from and serve the slow city's vision rather than be in contradiction with it.

Revitalisation of urban areas is a complex, multi-faceted process. Currently, Polish researchers most frequently refer to the statutory definition of revitalisation, which states that it is 'a process of assisting degraded areas in overcoming a crisis through integrated measures for the benefit of the local community, space and economy, focused on a given area and performed by revitalisation stakeholders on the basis of the municipal revitalisation programme' (*The act on revitalisation*, 2015, paragraph 2, p. 1). This process, especially in English language references, is also called urban regeneration, which means: 'comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in the economic, physical, social and environmental condition of an area that has been subject to change' (Roberts & Sykes, 2000, p. 17).

Revitalisation can contribute to the achievement of many effects emerging in the social, economic and spatial spheres in a city. These outcomes can be direct and revealed in a short time after completing a revitalisation programme, or else can be indirect and emerge over longer time horizon. Effects connected with the social sphere could consist of (Bartłomiejski & Kowalewski, 2019, pp. 1–10; Doroz-Turek, 2019, pp. 2–11; Konior & Pokojńska, 2020, p. 15; Mazur-Belzyt, 2017, pp. 3–7):

- greater engagement of residents and their social participation, thereby developing a civic society,
- creating local identity,
- improved accessibility and quality of social and cultural infrastructure,
- cultivating and preserving local traditions and cultural heritage,
- establishing institutions intended to stimulate social, cultural and occupational activity among the residents,
- better quality of life in the city,
- better knowledge of slow philosophy among the inhabitants of a slow city,
- alleviating social problems (poverty, social exclusion, gentrification).

Likely effects in the economic sphere are (Nowakowska & Grodzicka-Kowalczyk, 2019, pp. 15–19; Senetra & Szarek-Iwaniuk, 2020, p. 13; Skalski, 2018, pp. 248–257):

- giving an economic boost to degraded areas, for example, disused industrial, railway or military facilities,
- development of entrepreneurship, including business enterprises guided by slow philosophy,
- higher incomes for residents, for example, owing to the growth in tourism and services,

- greater specialisation and development of network cooperation, particularly as regards the creation of a tourism product for the Cittaslow network cities as well as promotional campaigns for both the cities and the entire network,
- sharing good practice and maintaining networked cooperation between cities as regards revitalisation programmes and their effects,
- expanding the range of ‘city’s products’ in the broad sense of this term,
- attracting investors interested in revitalised areas,
- new jobs,
- higher value of real estate properties in a revitalised area,
- higher tax revenues earned by the city,
- promotion of the city and building the image of a slow city,
- transformation of the city’s economic system towards circular economy.

Some of the effects that appear in the spheres of urban space and environment are as follows (Farelnik & Stanowicka, 2016, pp. 364–369; Hołuj, 2016, pp. 116–120; Jaszczak *et al.*, 2019, pp. 43–44; Jaszczak *et al.*, 2020, pp. 7–9; Jaszczak & Kristianova, 2019, pp. 8–9; Sas-Bojarska, 2017, pp. 12–13; Zagroba, 2016, p. 728; Zagroba *et al.*, 2020, pp. 4–17):

- improved visual appeal, cohesion, and functionality of public spaces, especially historic centres of cities,
- increased use of innovative solutions in urban infrastructure, increased use of alternative sources of energy and other pro-ecological solutions, also in transport and small street architecture,
- creating friendlier and safer spaces, better suited to cater for the needs of various social groups,
- spatial integration of a revitalised area with the remaining parts of the city,
- more cycle paths and better quality of cycling infrastructure,
- transformation of a city towards green city, eco-city and even smart city – creating the green and blue infrastructure.

Because of a variety of aspects it presents, a wide range of impact and a multitude of stakeholders engaged, revitalisation of urban areas can contribute to the development of a city and improvement of the quality of life of its residents. Through revitalisation, changes can be made that will allow residents to satisfy their needs better as well as contributing to the creation of new values, examples of which are new products, goods, services meant to satisfy local needs, new companies, creating new jobs, non-material values, such as: knowledge, qualifications and skills, human capital, attractive locations for economic and cultural activities and quality of the surroundings (compare Green Leigh & Blakely, 2013, pp. 71–96; McCann, 2016, pp. 127–144). More specifically, the core values of cities include human capital and social capital, cultural resources and cultural heritage, tourism and hospitality functions, attainment of the characteristics assigned to the concept of a creative city (e.g. the desideratum of diversity, desideratum of equality, understood as the lack of discrimination), the ability to interact and cooperate, financial potential, power potential (being in control, decision-making centre, skill of creating partnerships and atmosphere of cooperation), knowledge potential (ability to create new things, creativity and innovativeness), capability of shaping opinions by various institutions, creating the brand of a place, image, *genius loci*. These assets also play an important role in the process of developing a slow city. What truly matters in this context is anything which is local, endogenous, different, diverse, traditional, and emphasising the identity of a given city and region. Hence the aims of revitalisation of Cittaslow cities needs to take into account the preservation of their local assets (compare Zawadzka, 2017, pp. 101–104; Jaszczak *et al.*, 2021, pp. 1–24; Marks-Bielska *et al.*, 2020, pp. 463–487).

Considering the research subject, it is worth drawing attention to the fact that positive effects obtained from a revitalisation project can translate into an improved degree of the city fulfilling certification criteria, i.e. parameters of an assessment an applicant city is submitted to by the Cittaslow association, as well as re-certification, i.e. a repeated assessment made after 5 years of the city’s membership in the network. If a town’s

certification score exceeds 50% of the requirements, it will be declared a new Cittaslow member. The criteria for certification of a new member and re-certification of 'old' members of Cittaslow can be a determinant of the urban development policy that will be implemented in the future. The list of all 72 criteria includes 31 obligatory requirements, 5 prospective requirements and 36 other requirements (*Cittaslow International Charter*, 2017, pp. 25–27). Particularly significant in this context could be revitalisation projects planned and implemented after the slow city concept has been added to the local development policy. Owing to planned revitalisation measures, a city can achieve a series of effects in the areas that are evaluated during subsequent recertifications. Thus, when planning to stimulate a city which develops in line with slow philosophy by revitalising selected urban areas, such programmes can be directed towards the achievement of effects in the areas which certification covers, i.e. energy and environmental policy, infrastructure policies, quality of urban life policies, agricultural, touristic and artisan policies, policies for hospitality, awareness and training, social cohesion, and partnerships.

Apart from the possible outcomes of revitalisation in Cittaslow cities mentioned above, which mainly concern single cities, worth noticing is the fact that revitalisation can generate positive effects in a larger groups of cities (e.g. creation of a network tourism product, increased socio-economic potential, promotion of cities) and even have a visible influence over an entire region, especially one like Warmia and Mazury, where the highest number of slow cities in whole Poland is situated. Cittaslow member cities undergoing revitalisation can become one of the main image products of this region (*Strategy of tourism development...*, 2016, p. 43). Nonetheless, it would be a mistake to ignore threats and negative consequences of urban revitalisation processes, which in the Cittaslow network member cities may include: ghettoisation of an area of the city undergoing revitalisation, or else turning the whole city into an 'open air museum', excessive tourism traffic, and consequently excessive burden on the city's infrastructure and historical buildings, loss of precious, endogenous resources.

3. Methodology

The literature research confirms that revitalisation in small cities can be an effective instrument applied for their development. An important factor in the perception and analysis of this issue could be the network perspective, where cities can undertake revitalisation efforts collaboratively and revitalisation effects can be networked and synergistic, that is present not in just one but in a group of cities. An example is revitalisation carried out in the Polish Cittaslow cities, which belong to the Association 'Polish Cittaslow Cities'.

The aim of the study was to discuss the specific character of revitalisation processes in cities which are members of the Polish National Cittaslow Network, to evaluate the importance of revitalisation for the development of Polish slow cities, and to determine to what extent revitalisation is used as an instrument in the local development policy of the Polish National Cittaslow Network.

The applied research methods were a critical literature analysis, and an analysis of the results of a questionnaire survey. The survey, carried out in May 2020, was based on a standardised questionnaire, which contained closed and open questions. It was addressed to mayors of all member cities of the Polish Cittaslow Network: Barczewo, Bartoszyce, Biskupiec, Bisztynek, Braniewo, Dobrze Miasto, Działdowo, Głubczyce, Gołdap, Górowo Iławeckie, Jeziorany, Kalety, Lidzbark, Lidzbark Warmiński, Lubawa, Murowana Goślina, Nidzica, Nowe Miasto Lubawskie, Nowy Dwór Gdański, Olsztynek, Orneta, Pasym, Prudnik, Rejowiec Fabryczny, Reszel, Ryn, Rzgów, Sępólno, Sierpc, Sianów, and Wydminy. It was returned by all network member cities. Therefore, the study was of a comprehensive character and comprised all the units belonging to the studied population (at that time, there were 31 Cittaslow cities). Admittedly, a weakness of the study is that it relied on opinions of just one type of stakeholders engaged in revitalisation (i.e. local authorities). The conclusions, however, were also based on data from Statistics Poland, which concerned the revitalisation programs implemented in all Polish municipalities (*Statistical data on revitalisation...*, 2018).

The study also employed a method of critical analysis of the literature and an inductive reasoning method. The critical review of the scientific literature included Polish and English language references that raised the issues of the *slow city* development model, development of the international and Polish National Cittaslow Network, as well as potential effects and the role of revitalisation process. The inductive reasoning method was used to formulate conclusions drawn from the review of the relevant literature and from the empirical studies performed by the author.

4. Results

Thus far, revitalisation measures in Cittaslow cities have been based on separate revitalisation programmes in individual cities or on a supralocal document concerning the revitalisation of 19 slow cities, i.e. *Supralocal revitalisation program for the network of Cittaslow cities in the Warmińsko-Mazurskie Voivodeship*, developed in 2015 and updated in 2017, 2018, 2019 and 2020 (Table 1).

Table 1. Revitalisation programs in cities of the Polish National Cittaslow Network

Year of admission	City	Type of territorial unit ¹	Voivodeship	Total population in 2019	Type of revitalisation program ²	Duration of revitalisation program
2007	Biskupiec	urban-rural	Warmińsko-Mazurskie	10,634	RP	2016-2020
	Biszynek	urban-rural	Warmińsko-Mazurskie	2,359	PP	2015-2020
	Lidzbark Warmiński	urban	Warmińsko-Mazurskie	15,697	RP	2016-2023
	Reszel	urban-rural	Warmińsko-Mazurskie	4,550	RP	2016-2023
2010	Murowana Goślina	urban-rural	Wielkopolskie	10,433	RP	2013-2020
	Nowe Miasto Lubawskie	urban	Warmińsko-Mazurskie	10,850	RP	2016-2023
2012	Lubawa	urban	Warmińsko-Mazurskie	10,388	RP	2015-2024
	Olsztynek	urban-rural	Warmińsko-Mazurskie	7,514	RP	2016-2025
	Ryn	urban-rural	Warmińsko-Mazurskie	2,843	RP	2016-2023
2013	Barczewo	urban-rural	Warmińsko-Mazurskie	7,501	RP	2016-2023
	Dobre Miasto	urban-rural	Warmińsko-Mazurskie	10,182	RP	2016-2023
	Gołdap	urban-rural	Warmińsko-Mazurskie	13,708	RP	2017-2020
2014	Górowo Iławeckie	urban	Warmińsko-Mazurskie	3,940	RP	2016-2023
	Kalety	urban	Śląskie	8,589	RP	2012-2020
	Nidzica	urban-rural	Warmińsko-Mazurskie	13,694	RP	2017-2020
	Nowy Dwór Gdański	urban-rural	Pomorskie	9,888	MRP	2017-2023
	Pasym	urban-rural	Warmińsko-Mazurskie	2,498	RP	2015-2020
	Rejowiec Fabryczny	urban	Lubelskie	4,386	RP	2017-2023
2015	Bartoszyce	urban	Warmińsko-Mazurskie	23,284	RP	2016-2022
	Działdowo	urban	Warmińsko-Mazurskie	21,274	RP	2015-2020
	Lidzbark	urban-rural	Warmińsko-Mazurskie	7,741	RP	2016-2022
	Orneta	urban-rural	Warmińsko-Mazurskie	8,723	RP	2016-2021
	Prudnik	urban-rural	Opolskie	20,989	RP	2017-2023
2016	Głubczyce	urban-rural	Opolskie	12,521	RP	2016-2020
	Jeziorany	urban-rural	Warmińsko-Mazurskie	3,153	MRP	2017-2020
	Sępól	urban-rural	Warmińsko-Mazurskie	1,941	-	-
2017	Rzgów	urban-rural	Łódzkie	3,371	RP	2017-2023
	Sianów	urban-rural	Zachodniopomorskie	6,621	RP	2017-2023
2019	Braniewo	urban	Warmińsko-Mazurskie	16,992	RP	2017-2022
	Sierpc	urban	Mazowieckie	17,933	RP	2017-2025
	Wydminy	rural	Warmińsko-Mazurskie	6,233	-	-
2020	Morąg	urban-rural	Warmińsko-Mazurskie	13,701	RP	2017-2023
	Olecko	urban-rural	Warmińsko-Mazurskie	16,422	-	-
	Szczytno	urban	Warmińsko-Mazurskie	23,088	RP	2017-2020

¹ urban-rural (a city located in urban-rural commune), urban (municipal commune), rural (rural commune)

² MPR – municipal revitalisation program, RP – revitalisation program

Source: the author, based on Local Data Bank (2020) and *Statistical data on revitalisation...* (2018)

The overarching objectives of revitalisation measures envisaged in the mentioned supralocal programme were: to support social inclusion, combat poverty and to improve the quality of life of local communities living in some problem areas. More specific aims are: greater social capital of the city, creating proper conditions for revitalisation projects, protection of cultural heritage, improved quality of the natural environment, reinforced local economy (creating good conditions for the development of tourism and hospitality business, commerce and services, local retailers and restaurants, etc., by revitalising the public space, creating the environment in which entities supporting occupational activity and improvement of professional qualifications can operate), revitalisation and modernisation of the public space (for example, restoration of a previous or creation of a new function, formation of the conditions conducive to the sustainable development of a given area based on its characteristic assets, improvement of the quality of life and living conditions for residents, greater social cohesion by eliminating poverty, alleviating inequalities, increased employment rate and social integration), renovation and refurbishment of buildings, improved residential housing conditions, better conditions for education, science and culture, improved social welfare infrastructure, formation and support of social networks (creating favourable conditions for a stronger sense of local identity, supporting social programmes and initiatives) (*Supralocal revitalisation program...*, 2020, pp. 46–48). During revitalisation, it is expected that the implemented measures will produce medium- and long-term positive effect in social, economic, environmental, spatio-functional and technical spheres (Table 2).

Table 2. Vision of revitalised areas in Cittaslow cities

Sphere	Effects of the revitalisation of a slow city
Social	<ul style="list-style-type: none"> - Permanent effects will be achieved owing to a broad-scale social integration of ‘problem groups’ and abolishment of discrimination and social exclusion - The need to coordinate the work of different revitalisation process participants will facilitate more vigorous public dialogue and formation of civic attitudes - Cooperation of institutions and persons engaged in revitalisation as well as the social effects of revitalisation measures will be a contributing factor in the achievement of the priority such as the ‘Open Society’ strategic region. - Improved quality of life of the city inhabitants will fulfil the so-called marketing promise included in the promoted region’s brand ‘healthy life, pure benefit’ - Use of the existing possibilities to acquire financial support from the structural funds and their further effective optimisation as well as integrated measures will contribute to the alleviation of crisis events in revitalised areas
Economic	<ul style="list-style-type: none"> - Suitable conditions will be created for the local economy to operate and grow - There will be improvement in competences of the local inhabitants in terms of their participation in the labour market, development of local enterprises, creating new jobs, and consequently the unemployment rate on revitalised areas will decrease - Increased occupational activation of inhabitants will be achieved by raising their qualifications and enhancing the quality of education - Enlivenment of economy in revitalised areas will become a component part in the achievement of one of the region’s strategic priorities, i.e. ‘Competitive Economy’
Environmental	<ul style="list-style-type: none"> - Execution of thermal insulation projects will reduce primary energy consumption in revitalised public buildings and decrease the demand for heat power, which will lead to lower emissions of greenhouse gases to the atmosphere
Spatial and functional	<ul style="list-style-type: none"> - Owing to the revitalisation and refurbishment of public space, it will gain higher value and will be more appealing to visitors and inhabitants, in addition to which it will offer better conditions for locating commerce, services or cultural functions, which will create a chance to strengthen the local economy permanently - As a result, the image of the revitalised area will be improved distinctly, also leading to some positive changes in neighbouring areas - Cooperation between cities will bring about a positive effect, thereby being an impulse stimulating further development of the network and the concept of the sustainable development of the network, which will be a contributing factor to the achievement of the region called ‘Modern Networks’. - An ecofriendly approach to revitalisation will generate directly positive effects on the living conditions for

	<p>residents and on the appeal of the revitalised area for tourists and investors</p> <ul style="list-style-type: none"> - Revitalisation of public space will act as a positive stimulus to private owners of the real property in and around the revitalised area, and an impulse to subsequent investments, while professional performance of revitalisation projects will instil a positive attitude in the local community to revitalisation issues, and will create a good atmosphere for further revitalisation measures - By building a modern system for foot and cycle traffic, suitable conditions will appear for more intensive promotion of ecofriendly means of transport and will enhance the attractiveness of public places - Revitalisation measures conducted simultaneously in several locations will help the Cittaslow cities to become more visible on both regional and national maps, which in turn will make a beneficial contribution to all promotional campaigns
Technical	<ul style="list-style-type: none"> - By executing complex thermal insulation projects, it will be possible to improve the quality of residential resources in the revitalised area, while the revitalisation of infrastructure will improve its accessibility and functionality

Source: the author, based on the *Supralocal revitalisation program...* (2020, pp. 49–50)

The supralocal revitalisation programme took into consideration various types of revitalisation measures, with the focus on spatial, economic or social aspects, where the aim was to improve the quality of life of the local community dwelling in an area undergoing revitalisation (Table 3).

Table 3. Examples of revitalisation projects conducted in Cittaslow member cities

City	Name of project
Barczewo	<ul style="list-style-type: none"> - Founding the Centre for Many Cultures - Landscaping the Pisa River banks - Founding the Activisation Centre
Bartoszyce	<ul style="list-style-type: none"> - Revitalisation of Bohaterow Westerplatte Square and the municipal park - Founding the Local Activation Centre - Conversion and adaptation of a former railway station
Biskupiec	<ul style="list-style-type: none"> - Founding the Educational Centre - Founding the Occupational Centre - Creating an improved offer of cultural and recreational events in the revitalised area of Biskupiec - Founding the Activated Mobility Centre (CAR) on Kraksy Lake
Bisztynek	<ul style="list-style-type: none"> - Improved availability of social services – refurbishment and adaptation of an existing building to serve a new, social function - Founding the Youths Social Integration Club - Adaptation of the Lidzbarska Gatehouse including the landscaping of the surrounding premises
Dobre Miasto	<ul style="list-style-type: none"> - Development of public space to serve social integration - Founding a centre affiliated to the Municipal Welfare Centre in Dobre Miasto – financial support to the services offered there and acquisition of necessary furniture and equipment
Działdowo	<ul style="list-style-type: none"> - Revitalisation of public space
Gołdap	<ul style="list-style-type: none"> - Finishing the construction and furnishing the Culture Centre in Gołdap - Development of the waterfront along Gołdap Lake - ‘Under Good Wings’ – the Centre for the Support of Families - Conversion of an outbuilding to a pottery workshop, including furniture and equipment
Górowo Iławeckie	<ul style="list-style-type: none"> - Revitalisation of social space in the Old Town of Górowo Iławeckie - Major refurbishment of the degraded building of the Culture Centre in Górowo Iławeckie - Creating a recreational and sensory park around Garncarski Pond in Górowo Iławeckie - Revalorisation of the Młynówka River valley in Górowo Iławeckie
Jeziorany	<ul style="list-style-type: none"> - Revitalisation of a historic park
Lidzbark	<ul style="list-style-type: none"> - Development of vacant plots along the Wel River
Lidzbark Warmiński	<ul style="list-style-type: none"> - Founding the Occupational Activation Centre - Social and occupational activation owing to the modernisation of the amphitheatre and building the Centre of Handicrafts and Culture of Warmia - Development and landscaping of the Łyna River banks

	- Complete refurbishment of multi-flat buildings concerning power supply and insulation
Lubawa	- Founding a social activity centre at the Castle of the Chelm Bishops - Refurbishment and modernisation of the public space within the Old Town
Nidzica	- Revitalisation of the centre of Nidzica – reconstruction of the market square in the centre of the city - Refurbishment of the castle and the landscaping of the castle hill in Nidzica - Organisation of workshops and educational, occupational and social events for persons at risk of social exclusion in the revitalised area - Refurbishment of the park on the lake – landscaping work in the vicinity of the park
Nowe Miasto Lubawskie	- Major refurbishment and adaptation of the building of the Municipal Culture Centre to open the Manufacture of Old Crafts - Refurbishment and adaptation of a former Lutheran church to open the Centre of Tourist Information and Promotion of Culture - Revitalisation of the market square in Nowe Miasto Lubawskie - Revitalisation of the municipal park
Olsztynek	- Setting up the Youth Social Integration Club called ‘Move and Learn’ - Development and landscaping of the municipal beach - Contribution to the development of the region’s natural and cultural heritage by completing the refurbishment and modernisation of an old water pump
Orneta	- Revitalisation of the public space at the Franciszek Chruściel Municipal Centre of Culture in Orneta for cultural and recreational purposes
Pasym	- Revitalisation and refurbishment of the Old Town square in Pasym – creation of a social integration and activation space - Founding the Social Activation Centre – a seat for the Social Integration Club
Reszel	- Social and occupational activation of persons socially excluded or at risk of social exclusion - Development of the public space by restoring integration and recreational functions of the municipal park and its environs, including the improved functionality of avenues and paths within the park
Ryn	- Revitalisation of a water pump, including its adaptation to new purpose - Revitalisation of the public space by creating squares with green areas and street architecture along the shorelines of Ryńskie Lake - Modernisation and adaptation of the rooms in a former nursery school to perform cultural, educational and other purposes, e.g. the Regional Park of Education, Culture and Tourism

Source: the author, based on the *Supralocal revitalisation program...* (2020, pp. 64–142)

Statistics Poland provides data which prove that the revitalisation measures carried out to this day and based on either individual or supralocal programmes, have covered a total area of Cittaslow cities of nearly 3 750 ha. The total number of the population living in degraded areas of the Polish slow cities at the time these were distinguished exceeded 110 000 people (which equals 31% of the total population of all Polish Cittaslow cities). Revitalisation was mainly carried out in areas situated in and near the city centre (54.5%), less often away from the centre (11.6%) or in rural areas, which could occur in rural-urban municipalities (30%). The share of revitalised green areas, or disused industrial, railway or military properties was almost negligible (total 2.6%) (Figure 1).

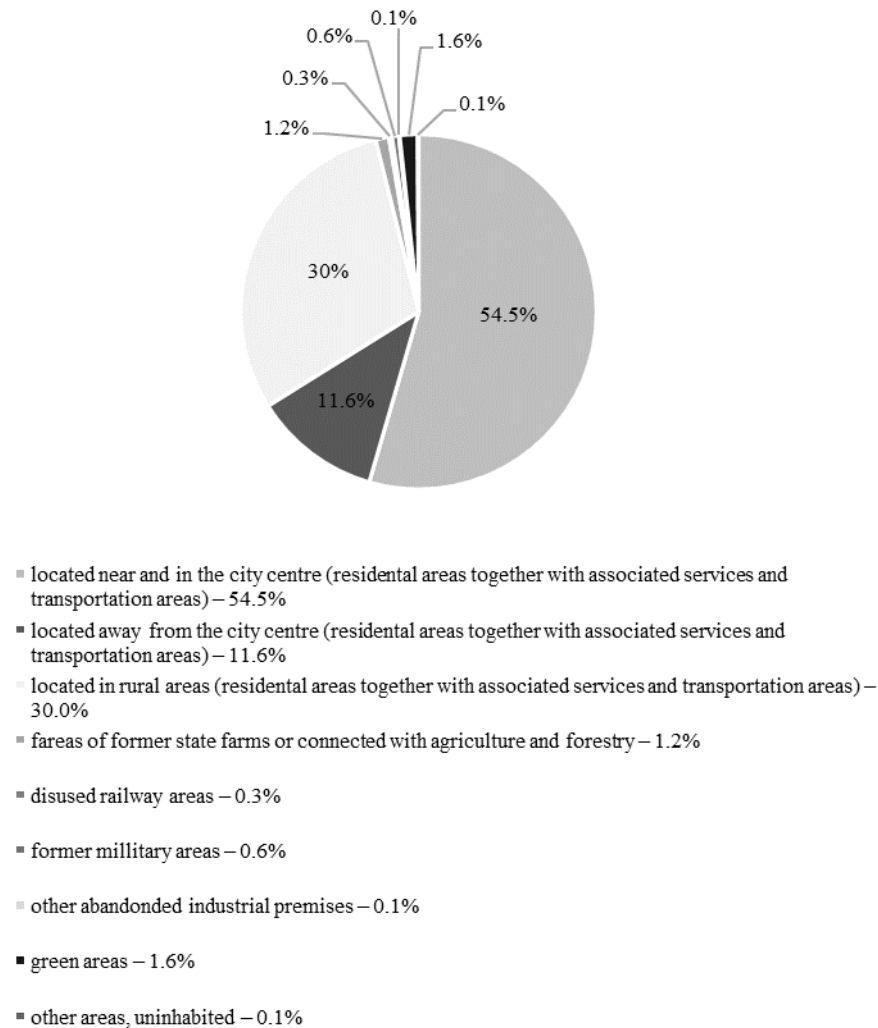


Figure 1. Types of revitalised areas in Cittaslow municipalities (share in the total area of all revitalised parts in %)

Source: the author, based on *Statistical data on revitalisation...* (2018)

At the end of December 2020, the Polish Cittaslow Network consisted of the following cities: Biskupiec, Bisztynek, Lidzbark Warmiński, Reszel (these cities accessed the network in 2007), Murowana Goślina, Nowe Miasto Lubawskie (2010), Lubawa, Olsztynek, Ryn (2012), Barczewo, Dobre Miasto, Gołdap (2013), Górowo Iławeckie, Kalety, Nidzica, Nowy Dwór Gdański, Pasym, Rejowiec Fabryczny (2014), Bartoszyce, Działdowo, Lidzbark, Orneta, Prudnik (2015), Głubczyce, Jeziorany, Sępólno (2016), Rzgów, Sianów (2017), Braniewo, Sierpc, Wydmyny (2019), Morąg, Olecko, and Szczytno (2020). As the survey took place in May 2020, the analysis applies to 31 cities, excluding the cities that joined to the network at the end of 2020. Because the Cittaslow network has been developing in Poland for a relatively long time, the mayors were asked to point to no more than five most important effects achieved in their cities owing to the membership in the Cittaslow network. Revitalisation and activation of degraded areas in the city was one of the most popular indications (chosen in 58% cities). The survey results verified that revitalisation measures pursued in cities are connected with the

membership of cities in the Cittaslow network. By planning revitalisation measures from a supralocal perspective, the Cittaslow cities had better chances to perform the planned projects and to develop more rapidly owing to the UE funds. Other important effects achieved in connection with the membership in the Cittaslow network, the mayors indicated: more effective promotion of the city (58%), improved aesthetic value, quality and accessibility to public space (55%), acquisition of additional sources of investment funds, e.g. from the EU funds (52%), building a positive image of a Cittaslow city, ‘a city where living is good’ (42%), developing collaboration with Cittaslow member cities (36%), more intensive cultural life and events connected with the preservation of cultural heritage (29%), and improved quality of life in a city, noticeable to city residents (26%). This distribution of replies may suggest that the aims of revitalisation and the vision of a city development arising from the adopted slow city model are compatible, and the effects of the membership in the Cittaslow network indicated by the respondents are to a great extent achievable owing to the revitalisation the cities undertake.

It should be emphasised that the elaboration of the Supralocal revitalisation program for the network of Cittaslow cities bettered the chances of the cities included in the program to acquire external sources of funds for such investments, especially in the smallest cities. One of the reasons is that an amount of 51.1 million euros was allocated to the implementation of this program in the Operational Program of the Warmińsko-Mazurskie Voivodship for the years 2014-2020. When analysing the total amount of the funds allocated to revitalisation in the Cittaslow cities (not just the funds planned in the *Supralocal revitalisation program for the network of Cittaslow cities in the Warmińsko-Mazurskie Voivodeship*, but also in revitalisation programs for individual cities), in both absolute (PLN) and relative (PLN *per capita*) figures, it is possible to observe quite a considerable variation in these values. The highest sum of the funds allocated to the projects planned in revitalisation programs during the entire time period covered by the program was in the following municipalities: Murowana Goślina, Bartoszyce, Lubawa, Szczytno, Biskupiec, Morąg, whereas the least funds were secured in Jeziorany, Orneta, Lidzbark. Estimated sums of funds to projects covered by the revitalisation program over its entire implementation time expressed per 1 resident of a city reached the highest value in Murowana Goślina, Lubawa, Sianów and Górowo Iławeckie, being the lowest in Gołdap, Braniewo, Orneta. The distribution of the Cittaslow municipalities with respect to the value of estimated funds dedicated to projects included in the revitalisation program during its implementation period as well as the value of estimated funds to projects planned in the revitalisation program during its entire duration calculated *per capita* are illustrated in Figure 2.

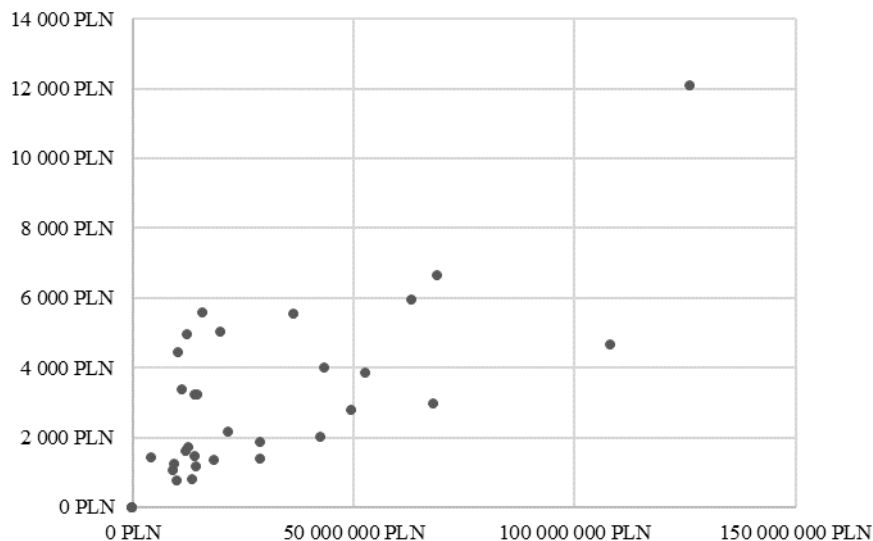


Figure 2. Distribution of Cittaslow municipalities in respect of estimated funds to finance projects contained in the revitalisation program throughout its duration (PLN) (horizontal axis) and estimated funds to finance projects contained in the revitalisation program throughout its duration *per capita* (PLN *per capita*) (vertical axis)

Source: the author, based on *Statistical data on revitalisation...* (2018)

Respondents to survey were also asked whether results of a city's certification and recertification (following the *Cittaslow International Charter*) were taken into consideration when developing and implementing the city's strategy. In 6 out of the 31 analysed cities (19%), the answer was 'certainly yes', and in other 17 cities (55%) the reply was 'usually yes'. Respondents from 8 cities (26%) replied that they did not usually take into account results of their city's certification when planning the city's development strategy, although none of the respondents chose the answer 'definitely not'. Nearly three quarters of the mayors invited to participate in the survey acknowledged the importance of certification in the planning of the development of slow cities. Diagnosis and reflection which accompany the process of certification or recertification can play a particularly important role in shaping a long-term development pathway for a slow city, by definition based on the city's unique internal resources, which are actually the subject of a certification assessment. The survey results implicated the need to expand the research on the use of certification tools and results of certification assessments in the planning of a slow city's revitalisation. These could be particularly helpful for determination to what extent a revitalisation program undertaken in a given city has resulted in its improved score with regard to the macro-areas that are submitted to certification. Another question it can resolve is whether revitalisation measures are compatible with the slow philosophy.

5. Discussion

The cities in the Polish network are diverse with respect to many aspects, such as the size of their population, population density, situation in the labour market, or level of social and economic development (Wierzbicka, 2020, pp. 217–218; Wierzbicka *et al.*, 2019, p. 121; Senetra & Szarek-Iwaniuk, 2020, p. 13). They also vary in the capacities (infrastructure, funds, and organisation) to undertake and pursue revitalisation efforts. Thus, the Cittaslow cities are also diverse in their ability to use revitalisation in the local development policy. The course of revitalisation in slow cities depends on a great variety of factors, which can be associated with individual conditions for the development of small network member cities, development of the collaboration between cities within the network, and external circumstances, such as the policy of development of cities implemented on the national and regional levels, or accessibility to external sources of financing revitalisation projects (Farelnik, 2020b, pp. 25–33; *Supralocal revitalisation program...*, 2020, pp. 43–45).

The *Supralocal revitalisation program for the network of Cittaslow cities in the Warmińsko-Mazurskie Voivodeship* is an example of an integrated enterprise, interesting on an international scale. It is one of the few very specific, 'hard' projects undertaken in town networks. Through united action, acknowledgement of the idea and engagement of regional authorities, cities were able to gain significant funds and to perform the planned revitalisation activities on a regional scale. By means of revitalisation, each of the engaged cities made attempts to employ its unique potential for real development and improvement in the life quality of its inhabitants (Mazur-Belzyt, 2017, p. 7). Zadęcka (2018, pp. 95–96) also mentions revitalisation one of the benefits from the implementation of the 'slow city' model. The role of revitalisation planned in the supralocal context as an important domain for the collaboration of the Polish Cittaslow cities is also supported by results of other studies concerning the cooperation between Cittaslow cities carried out so far (Farelnik, 2020a, pp. 276–177).

Revitalisation can be perceived and analysed in two ways: as a tool serving to implement the slow city model and as an effect of being a member of the Cittaslow network, which has created opportunities to perform this process in the supralocal (network-related) perspective (Strzelecka, 2018, pp. 58–61). As highlighted by Skalski (2018, p. 253): 'it is no longer time to think in the scale and categories of 'my commune', excluding oneself from the territorial context, from the otherwise natural competition with neighbouring communes. Experiences teach that in the National Cittaslow Network in the Region of Warmia and Mazury, it is a 'team fight'. Mutual assistance in the implementation of a well-thought-out supralocal program – is always positive, because it works synergistically'. Thus, whenever we encounter such supralocal perception of how to plan the development of Cittaslow cities,

revitalisation should be planned with the view of ensuring benefits not just for a single city but for a group of cities and for the entire network. However, this issue needs some further, more detailed investigations.

This research has proven that Cittaslow cities take advantage of the results of certification in the policy of their local development, and the list of measured parameters as well as the scores earned by certified cities may be an indicator of how to direct future activities to develop a city and to improve its score in five years. The current results are in agreement with the opinions expressed by other authors who underline, when discussing Cittaslow certification requirements, that ‘the most significant managerial implication can be considered the importance that policy-makers recognize in defining and implementing projects and initiatives that not only allow granting and maintenance of certification, but also support the identification of areas considered most strategic for the sustainable development of the destination and at the same time avoid wasting resources in activities not considered strategic. (...) There is also the ability of policy-makers to link these specific actions to clear goals and related tools that will be used to quantify the achievement of each goal’ (Presenza *et al.*, 2015, p. 58).

The fact that so many Cittaslow cities are turning to revitalisation proves that the city authorities are aware of it being a development tool which can have positive bearing on the development of the city they manage and which may contribute to the successful implementation of the slow city vision they pursue. The development of Cittaslow cities relies heavily on the endogenous potential of each member city, and well-planned revitalisation efforts can certainly help to preserve such endogenous assets (compare Çiçek *et al.*, 2019, pp. 402–410).

6. Conclusions

In respect of the purpose of this study, it has been proven that revitalisation is used as a tool in a local development policy by the vast majority of Polish slow cities, therefore suggesting that this process has (and will likely continue to have) much importance to the development of these localities. Effects of revitalisation can be observed in many areas in which a city functions, which is evidenced by the determined character and localisation of revitalisation projects implemented in Cittaslow cities. These projects most often entail revitalisation of historic city centres, preservation of cultural heritage, or the establishment of institutions dedicated to social and cultural activation of the city inhabitants. Other than effects observed immediately (revitalisation improved the aesthetic value, quality and accessibility to public space), revitalisation can also contribute to a more effective promotion of the city and building the positive image of a Cittaslow city.

A revitalisation program developed on a supralocal scale can help to achieve yet another objective, such as the enhanced collaboration between member cities. A good example is the *Supralocal revitalisation program for the network of Cittaslow cities in the Warmińsko-Mazurskie Voivodeship*, where networked cities make a shared effort to secure sources of funding for revitalisation projects, and also to concentrate these funds in cities which have adopted a similar model of development (slow city). Thus, this innovative approach to the financing of revitalisation, where the allocation of funds invested in revitalisation concerns a network of cities and where applications for financial support are submitted by entities that belong to a larger networked structure. This testifies to the fact that competition among cities (for example, to obtain funds for revitalisation from EU sources), owing to the network collaboration, can evolve towards effective co-competition of cities. This approach deserves attention and should be the subject of broader considerations, especially in the view of the subsequent EU financial perspective. After 2020, the financing of revitalisation from the EU funds, which are after all limited, will not be so easy and therefore local authorities (and other local bodies) will have to search for other sources of funds, which will enable them to achieve this goal. An opportunity for securing an optimal funding scheme for revitalisation projects seems to lie in their financing with the help of public-private partnership. Diversification of both means and sources of funding revitalisation projects will be necessary in the future. This will also be important for building the resilience of slow cities.

Regarding cooperation, partnership but also the financial structure of such projects, it is worth underlining the role of private entities in the process of revitalisation of slow cities. It appears that striving towards a greater involvement of private entrepreneurs in running their businesses in revitalised areas, especially when their business activities are related to culture, education, local community integration, restaurants, local handicrafts, small crafts and services, should be an important objective inscribed in the local policy of development. Obviously, there is a role to be played in this context by these enterprises which have been awarded the title of 'A Friend of Cittaslow' and operate in the area covered by a given municipality. Hence, a possible field for future studies on the Cittaslow network cities is the development of entrepreneurship in accord with the slow city model in revitalised urban areas. Such research would supplement very well the current study, where conclusions were based solely on opinions provided by one group of revitalisation stakeholders (local authorities).

Revitalisation in the spirit of slow philosophy is a tool of social and economic activation of cities, and when properly planned can contribute to the development of a small town and to the improved quality of life in its boundaries. What matters here is to be guided by the principles of the slow city model when planning revitalisation measures, as the former has an adaptable (rather than universal) character and favours a creative and innovative view of the future of a city, 'a city where living is good'. It would also be useful to continue the growth of the network approach already initiated by the Polish slow cities, placing more emphasis on network-related and synergistic effects attainable in future supralocal programs of revitalisation in the Cittaslow network cities. As a result, it will be possible to perfect the methodology of designing a supralocal (networked) revitalisation program, so as to make it an effective tool applied for the development of the Cittaslow network cities, providing them with an opportunity to create network tourism products and encourage social activity.

References

- Bartłomiejski, R., & Kowalewski, M. (2019). Polish urban allotment gardens as 'slow city' enclaves. *Sustainability*, 11(3228), 1-12. <https://doi.org/10.3390/su11113228>
- Brodziński, Z., & Kurowska, K. (2021). Cittaslow idea as a new proposition to stimulate sustainable local development. *Sustainability*, 13(5039), 1-15. <https://doi.org/10.3390/su13095039>
- Cittaslow International Charter*. (2017). Retrieved January 6, 2021, from http://www.cittaslow.org/sites/default/files/content/page/files/257/charter_cittaslow_en_05_18.pdf
- Cittaslow International List*. (2020). Retrieved January 6, 2021, from https://www.cittaslow.org/sites/default/files/content/it/page/files/774/cittaslow_list_december_2020.pdf
- Cittaslow – International network of cities where living is easy. Innovation by tradition*. (2019). Retrieved January 6, 2021, from https://www.cittaslow.org/sites/default/files/content/page/files/246/cittaslow_2019_brochure_1.pdf
- Cittaslow Manifesto*. (2020). Retrieved January 6, 2021, from https://www.cittaslow.org/sites/default/files/content/page/files/8314/cittaslow_manifesto_-_en.pdf
- Çiçek, M., Ulu, S., & Uslay, C. (2019). The impact of the slow city movement on place authenticity, entrepreneurial opportunity, and economic development. *Journal of Macromarketing*, 39(4), 400-414. <https://doi.org/10.1177/0276146719882767>
- Doroz-Turek, M. (2019). Revitalization of small towns and the adaptive reuse of its cultural heritage. *IOP Conf. Series: Materials Science and Engineering*, 471, 1-11. <https://doi.org/10.1088/1757-899X/471/5/052006>
- European Manifest Cittaslow*. (2012). Retrieved January 6, 2021, from https://www.cittaslow.org/sites/default/files/content/news/files/1711/manifest_english.pdf
- Farelnik, E. (2020a). Cooperation of slow cities as an opportunity for the development: an example of Polish National Cittaslow Network. *Oeconomia Copernicana*, 11(2), 267-287. <https://doi.org/10.24136/oc.2020.011>

- Farelnik, E. (2020b). Determinants of the development of slow cities in Poland. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 64(7), 18-36. <https://doi.org/10.15611/pn.2020.7.02>
- Farelnik, E., & Stanowicka, A. (2016). Smart city, slow city and smart slow city as development models of modern cities. *Olsztyn Economic Journal*, 11(4), 359-370. <https://doi.org/10.31648/oej.2938>
- Farelnik, E., Stanowicka, A., & Wierzbicka, W. (2020). *Cittaslow – model rozwoju i współpracy małych miast (Cittaslow – a model of development and cooperation between small cities)*. Olsztyn: University of Warmia and Mazury in Olsztyn.
- Farelnik, E., Stanowicka, A., & Wierzbicka, W. (2021). The effects of membership in the Polish National Cittaslow Network. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(1), 139-167. <https://doi.org/10.24136/eq.2021.005>
- Green Leigh, N., & Blakely, E. J. (2013). *Planning local economic development: theory and practice*. Los Angeles: Sage Publications.
- Hołuj, D. (2016). Social participation as a tool for managing functional and spatial changes. Examples of selected centres of small and medium-sized towns in Poland. *Journal of Settlements and Spatial Planning*, 7(2), 113-123. <http://doi.org/10.19188/02JSSP022016>
- Jaszcak, A., Kristianova, K., & Sopirova, A. (2019). Revitalization of public space in small towns: examples from Slovakia and Poland. *Zarządzanie Publiczne*, 1(45), 35-46. <https://doi.org/10.4467/20843968ZP.19.003.9944>
- Jaszcak, A., & Kristianova, K. (2019). Social and cultural role of greenery in development of Cittaslow towns. *IOP Conf. Series: Materials Science and Engineering*, 603(3), 1-9. <https://doi.org/10.1088/1757-899X/603/3/032028>
- Jaszcak, A., Kristianova, K., Pochodyła, E., Kazak, J.K., & Młynarczyk, K. (2021) Revitalization of public spaces in Cittaslow towns: recent urban redevelopment in Central Europe. *Sustainability*, 13(2564), 1-24. <https://doi.org/10.3390/su13052564>
- Jaszcak, A., Morawiak, A., & Żukowska, J. (2020). Cycling as a sustainable transport alternative in Polish Cittaslow Towns. *Sustainability*, 12(5049), 1-23. <https://doi.org/10.3390/su12125049>
- Konior, A., & Pokojka, W. (2020). Management of postindustrial heritage in urban revitalization processes. *Sustainability*, 12(5034), 1-19. <https://doi.org/10.3390/su12125034>
- Local Data Bank. (2020). Retrieved December 16, 2020, from <https://bdl.stat.gov.pl/BDL/dane/podgrup/tablica>
- Marks-Bielska, R., Lizińska, W., Wojarska, M., & Babuchowska, K. (2020). Institutional efficiency versus stability of local governments in basic areas of activity: the case of Poland. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 15(3), 463-487. <https://doi.org/10.24136/eq.2020.021>
- Mayer, H., & Knox, P. L. (2006). Slow cities: sustainable places in a fast world. *Journal of Urban Affairs*, 28(4), 321-334. <https://doi.org/10.1111/j.1467-9906.2006.00298.x>
- Mazur-Belzyt, K. (2017). ‘Slow’ revitalization on regional scale, the example of an integrated investment project. *IOP Conf. Series: Materials Science and Engineering*, 245, 1-7. <https://doi.org/10.1088/1757-899X/245/5/052040>
- McCann, P. (2016). Location theory. In J. E. Rowe (Ed.). *Theories of local economic development. Linking theory to practice*. London: Routledge, 127-144.
- Nowakowska, A., & Grodzicka-Kowalczyk, M. (2019). Circular economy approach in revitalization: an opportunity for effective urban regeneration. *Ekonomia i Środowisko*, 4(71), 8-20. <https://doi.org/10.34659/2019/4/45>
- Presenza, A., Abbate, T., & Perano, M. (2015). The Cittaslow certification and its effects on sustainable tourism governance. *Enlightening Tourism. A Pathmaking Journal*, 5(1), 40-64. <https://doi.org/10.2139/ssrn.2827705>
- Roberts, P., & Sykes H. (2000). The context of urban regeneration. In P. Roberts & H. Sykes (Eds.). *Urban regeneration: a handbook*. London: Sage Publications, 1-58.
- Sas-Bojarska, A. (2017). Linear revitalization – problems and challenges. Discursive article. *Urban Development Issues*, 53, 5-19. <https://doi.org/10.1515/udi-2017-0001>

Senetra, A., & Szarek-Iwaniuk, P. (2020). Socio-economic development of small towns in the Polish Cittaslow Network – a case study. *Cities*, 103(102758), 1-15. <https://doi.org/10.1016/j.cities.2020.102758>

Skalski, K. (2018). Cultural heritage of small cities as a vector of economic development in revitalization programs. *Space & Form*, 34, 247-264. <https://doi.org/10.21005/pif.2018.34.C-09>

Statistical data on revitalisation at the level of gminas. (2018). Retrieved January 6, 2021, from <https://stat.gov.pl/statystyki-eksperymentalne/obszary-funkcjonalne-oraz-dostepnosc-terytorialna/dane-statystyczne-z-zakresu-rewitalizacji-na-poziomie-gmin,5,1.html>

Strategy of tourism development for the Warmińsko-Mazurskie Voivodeship until 2025. (2016). Retrieved January 16, 2021, from <https://bip.warmia.mazury.pl/409/strategia-rozwoju-turystyki-wojewodztwa-warmińsko-mazurskiego-do-roku-2025.html>

Strzelecka, E. (2018). Network model of revitalization in the Cittaslow cities of the Warmińsko-Mazurskie Voivodship. *Barometr Regionalny*, 16(3), 53-62.

Supralocal revitalisation program for the network of Cittaslow cities in the Warmińsko-Mazurskie Voivodeship. (2020). Retrieved January 6, 2021, from https://cittaslowpolska.pl/images/PDF/PPR_do_zmian_2020_ostat.pdf

The act on revitalisation. (2015). Journal of Laws of October 9, 2015, item 1777.

Wierzbicka, W. (2020). Socio-economic potential of cities belonging to the Polish National Cittaslow Network. *Oeconomia Copernicana*, 11(1), 203-224. <https://doi.org/10.24136/oc.2020.009>

Wierzbicka, W., Farelnek, E., & Stanowicka, A. (2019). The development of the Polish National Cittaslow Network. *Olsztyn Economic Journal*, 14(1), 113-125. <https://doi.org/10.31648/oiej.3672>

Zadęcka, E. (2018). ‘Slow city’ as a local development model. *Economic and Regional Studies*, 11(3), 84-106. <https://doi.org/10.2478/ers-2018-0027>

Zagroba, M. (2016). Problems of the revitalization of historic centres in small towns in the north-eastern Poland. *Gazi University Journal of Science*, 29(4), 723-729.

Zagroba, M., Szczepańska, A., & Senetra, A. (2020). Analysis and evaluation of historical public spaces in small towns in the Polish Region of Warmia. *Sustainability*, 12(8356), 1-20. <https://doi.org/10.3390/su12208356>

Zawadzka, A. K. (2017). Making small towns visible in Europe: the case of Cittaslow network – the strategy based on sustainable development. *Transylvanian Review of Administrative Sciences, Special Issue*, 90-106. <https://doi.org/10.24193/tras.SI2017.6>

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ENTREPRENEURS' OPINION TOWARDS CREDIT RATING IN SAUDI ARABIA

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Abstract. This study aims to measure the entrepreneur's opinions towards their credit rating in Saudi Arabia. Credit rating plays a pivotal role in the financial market, especially its more significant impact on new startups from the micro and macro levels. On the other hand, the credit rating industry, in general, is in its infancy stage in the Saudi financial market. Therefore, a minor objective of this study is to present the problems and prospects of entrepreneurs towards their credit rating. The study has adopted the questionnaire from earlier research on credit rating. A sample of 210 respondents participated in this survey comprising entrepreneurs, business incubation managers, bankers, university professors, engineers, doctors, and other professionals. Descriptive statistics and Exploratory Factor Analyses were used to analyze the data. Findings show there are five essential factors affecting credit rating in Saudi Arabia, i.e., (1) Credibility, (2) Clarity, (3) Competence, (4) Communications, and (5) Customer Services. The research provides valuable insights into the credit rating business and recommends that CRAs in Saudi Arabia and elsewhere improve upon these five factors to strengthen their business.

Keywords: Credit Rating; Entrepreneur; Start-up; Entrepreneurial Finance; Saudi Arabia

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JEL Classifications: L26

1. Introduction

Credit rating agencies (CRA) play a pivotal role in the financial markets for providing creditworthiness information to investors and creditors. They provide credit ratings, which reflect the creditworthiness of companies and their ability to pay back the number of loans they borrow from lenders and their potential default (Siddiqui & Siddiqui, 2015).

The credit rating process involves gathering baseline information, analyzing it, and assigning an appropriate credit rating. This process is usually not cheap and easy as gaining confidential information has always been complicated. Moreover, companies do not prefer to provide their confidential information to any party that may request it. The solution is to provide confidential information to a third party specializing in assessment procedures and confirm not leaking the information to the market and the competitors. The third party is the Credit Rating Agency (CRA), which can assess and keep confidentiality.

Following the Saudi Vision 2030, Saudi Arabia is now approaching the international markets, and the concentration is on the shift from a hardcore oil-based economy to a more service-based economy, especially financial services economy. First, one of the major initiatives by the Saudi government is to encourage Saudi individuals to start their businesses rather than waiting for employment. In this regard, several initiatives were made, like emphasizing entrepreneurship education at the tertiary level, establishing university business incubators, and making an effective local entrepreneurial ecosystem. Secondly, the Saudi government is minimizing the limitations of non-Saudi investors entering the Saudi financial markets, operating in the Kingdom, and enhancing the role of venture capitalists and angel investors in Saudi Arabia. Still, there is a long way to institutionalize lending without collateral, the prime significance of venture capitalists and angel investors for young entrepreneurs and new startups. Recently, SIMAH Saudi Credit Rating Agency has started functioning as the only CRA in Saudi Arabia. In addition, SIMAH provides confidential reports about the history of the company's loans and their commitment to repayment.

On the other hand, there are many shortcomings in SIMAH's provided information, such as the company's environment, management, processes, and procedures used in operating the company. These factors must be studied to anticipate the level of risk the lender is about to take and assign the appropriate interest rate. After skimming through the literature, it was evident that there is no specific study has ever been conducted in Saudi Arabia on the entrepreneur's perspectives towards their credit rating or credit rating agencies in general.

The impact and critical role of credit rating agencies in the debt market is no more a secret. This CRAs role has gained considerable attention from policymakers and the management of financial institutions after the crises of 2008-2009. In the recent Eurozone crises, this role has become even more prominent (White, 2013). Other factors and information content also accompany the widespread role of CRAs. For example, most credit rating agencies offer more than credit rating services for securities and other financial products by providing other rating outlooks and rating reviews that indicate future credit rating changes (Keenan et al., 1998).

Many studies have covered various aspects of credit rating agencies' working, function, and importance. For example, Holthausen and Leftwich (1986) discuss the credit rating announcement and its impact on stock returns. Similarly, Behr and Güttler (2008) examined the stock market reaction to changes in unsolicited ratings. Bannier and Hirsch (2010) analyzed the other economic functions of credit rating agencies. In addition, some studies have highlighted various stakeholders' perceptions about credit rating agencies, e.g., Einig (2008) for the UK market whereas Madegowda (2010) for the Indian market. However, there is no such study exists for an important Middle Eastern market in Saudi Arabia. This study bridges that gap by providing entrepreneur's opinions towards the credit rating system and CRA in Saudi Arabia. It also highlights the problems faced by entrepreneurs in getting their credit facilities from the local financial markets.

The rest of the study is organized as under; the next section provides the review of literature on CRAs, section 3 provides the objective and methodology of the study, section 4 provides the results and discussion whereas, the conclusion is provided in section 5.

2. Literature Review

Internationally, the credit rating industry is oligopolistic (Becker & Milbourn, 2008), and three giants Moody's, Standard and Poor's (S&P), and Fitch, dominate the international scenario for credit rating (Siddiqui & Siddiqui, 2015). Moody's and S&P control 80% of the global market, and Fitch Ratings controls 15%. (Alessi, Wolverson, & Sergie, 2013). Other smaller niche players are also in the market, but they took a position in the sector other than the big giants. Table 1 presents the top five credit rating agencies in the world and their scope of work.

Table 1. Top Five International Credit Rating Agencies

Rating Agency	Scope of Work
Standard & Poor	Comprehensive – covers all entities listed above and more
Moody	Comprehensive – covers all entities listed above and more
Fitch	Public and Private fixed income securities in the USA
IBCA	Financial Institutions, Insurance companies, sovereign countries.
Thomson BankWatch	Financial Institutions worldwide
Duff & Phelps	Corporate Debt securities, Securitized Ratings & insurance companies

Source: Siddiqui & Siddiqui, 2015

Three critical observations can be made for credit rating agencies. Firstly, due to its oligopolistic nature, the barriers to entry are higher than in other markets, and this normality requires newcomers to have a tremendous reputation. Thus, the industry is based on reputation, and the awareness about smaller CRAs diminished. Secondly, very high earnings and profit margins are treated as a norm in the industry (Siddiqui & Siddiqui, 2015). Finally, until the financial crisis in 2008, these "sleepy agencies" were a little-recognized and little-understood part of the financial system. Aftermath, the industry attracted intensive media or political attention and became more aggressive in its marketing tactics (White, 2019).

A credit rating agency (CRA) is usually a recognized or authorized entity that evaluates the organization's creditworthiness and assigns appropriate credit ratings (Ashcraft, & Duffie, 2006). Ratings are generally a good indicator of the debtor's ability to pay back debt and potential default. Issuers may include governments, corporations, and non-profit organizations (Tang, Peytcheva, & Li, 2020).

Credit rating agencies play a pivotal role in financial markets, and they offer important information to the potential investors or lenders regarding the current and future projections about the organization seeking funds from capital markets. Literature had mentioned many roles of CRA in financial markets. Firstly, it provides a unique function of assigning ratings to institutions, instruments, and even countries. For example, CRAs assess the institution for their current and future situations (Frost, 2007), evaluate the borrower's performance and ability to repay the debt, and inform the lender (Ellis, Fairchild, & D'Souza, 2011). CRAs also provide certifications to rated institutions for their performance (Driss, Massoud, & Roberts, 2019) by providing a standard scale to compare companies with each other (Ebenroth, & Dillon Jr, 1992), and this rating is based on trusted and qualified criteria (White, 2010). This process helps investors judge the investment and its profitability (Ekins, Calabria, & Brown, 2011). The credit rating process is based on the analyses made on previous years' financial reports (Tullao Jr, Cabuay, & Hofileña, 2018) and providing feedback to institutions for improvement (Manso, 2013). Secondly, at a macro level, CRAs play a critical role in capital inflow and economic development. (Mutize, & Nkhalamba, 2021). They help countries and governments improve financial markets and economies (Grima, 2002) and encourage direct foreign investments (Mateev, 2009).

Thirdly, at the national level, CRAs regulate the financial market on behalf of the government (Rahim, 2010). Moreover, they stabilize the financial market (Jorge, 2019, Fong, 2018). They act both as a 'gatekeeper' and as a 'gateway constructor' to the financial markets (Smyth, Cole, & Fields, 2020), and provide uniformity to the market

by providing standardized comparisons between organizations (Cantor, & Packer, 1995). This process enhances the ability of institutions to repay debt (Greer, 2016). Finally, CRAs perform three functions at the micro-level: information management, risk management, and cost management. CRAs provide detailed information about the companies and their performance (Kinato, 2017) and reduce the information asymmetry and lemon problem in the financial market (Rhee, 2015). This act has two obvious benefits, it enhances the confidentiality of information (Kumar, & Rao, 2012) and reduces information collection costs (Cheng, & Neamtiu, 2009). For risk management, CRAs help investors and creditors understand the risk level in the investment (Cantor, & Packer, 1997) to help creditors with their investment risk assessments (Sethuraman, 2019). This process reduces the probability of losses and increases the financial market stability (Fong, 2018). Furthermore, it eventually reduces the risk and encourages investments (Finnerty, Miller, & Chen, 2013). For cost management, CRAs reduce the cost of debt (Kang & Ausloos, 2017), cost of regulations (Niedziolka, 2019), and the interest rate for organizations performing better (Mirović, Pavlović, & Puškarić, 2014). This process helps creditors assign interest rates (Sood, Mays, & Lindfield, 2012) and decide to increase or decrease interest rates for borrowers depending on the rating results (Jollineau, Tanlu, & Winn, 2014). Table 2 summarizes the role of credit rating agencies in financial markets.

Table 2. Major Characteristics of Credit Rating Agencies - Summary of the Literature

Year	Title	Major Characteristics of CRA	Reference
2021	International credit rating agencies in Africa: Perceptions, trends, and challenges	Plays a critical role in capital inflow and economic development.	(Mutize, & Nkhalamba, 2021)
2020	From gatekeepers to gateway constructors: Credit rating agencies and the financialization of housing associations	Acts both as a 'gatekeeper' and 'gateway constructor' to the financial markets	(Smyth, Cole, & Fields, 2020)
2019	Are credit rating agencies still relevant? Evidence on certification from Moody's credit watches	Provides certifications to a rated institution for their performance.	(Driss, Massoud, & Roberts, 2019)
	The Visegrád group countries' ratings: Do the CRAs make the decisions independently or piggyback themselves?	Decreases the cost of regulations	(Niedziolka, 2019)
	The effect of reputation shocks to rating agencies on corporate disclosures	Assists creditors with their investment risk assessments	(Sethuraman, 2019).
2018	Feasibility of a regional credit rating agency for the ASEAN	Analyzes the financial reports of previous years.	(Tullao Jr, Cabuay, & Hofileña, 2018).
	China's online peer-to-peer (P2P) lending platforms.	Reduces the probability of losses and increases the financial market stability.	(Fong, 2018)
2017	The impact of credit rating on FDI attraction into Africa	Provides detailed information about the companies and their performance	(Kinato, 2017)
	An inverse problem study: credit risk ratings as a determinant of corporate governance and capital structure in emerging markets: evidence from Chinese listed companies.	Decreases the cost of debt	(Kang, & Ausloos, 2017)
2016	Local government risk assessment: The effect of government type on credit rating decisions in Texas.	Presents ability of institutions to repay debt	(Greer, 2016)
2015	Feedback between credit ratings and financial markets.	Stabilizes the financial market	(Jorge, 2019).
	Why credit rating agencies exist.	Decreases information asymmetry and lemon problem in the financial market	(Rhee, 2015)
2014	Evaluating proposed remedies for credit rating agency failures.	Help the creditors to decide the interest rate for the borrower depending on the rating.	(Jollineau, Tanlu, & Winn, 2014)
	Asset securitization as a means of tourism financing	Reduces the interest rate for organizations performing better.	(Mirović, Pavlović, & Puškarić, 2014).
2013	The impact of credit rating announcements on credit default swap spreads	Minimizes the risk and encourages investments.	(Finnerty, Miller, & Chen, 2013).
	Feedback effects of credit ratings	Provides feedback to institutions	(Manso, 2013)
2012	Credit rating-role in the modern financial system.	Enhances the confidentiality of info.	(Kumar, & Rao, 2012)
	Subnational Finance for Infrastructure: Potential roles and opportunities for ADB.	Helps creditors to assign an interest rate	(Sood, Mays, & Lindfield, 2012)
2011	Regulation, market structure, and role of the credit rating	Helps investors to judge the investment	(Ekins, Calabria, &

	agencies	and its profitability.	Brown, 2011).
	Is imposing liability on credit rating agencies a good idea: Credit rating agency reform in the aftermath of the global financial crisis.	Evaluates the borrower's performance and their ability to repay the debt and informs the lender	(Ellis, Fairchild, & D'Souza, 2011)
2010	Credit rating agencies' roles have to be reassessed	Regulates the financial market on behalf of the government.	(Rahim, 2010)
	Using the tools of industrial organization to illuminate the credit rating industry	Provides rating based on trusted and qualifying criteria	(White, 2010)
2009	Determinants of foreign direct investment in Central and Southeastern Europe: New empirical tests	Encourages direct foreign investments	(Mateev, 2009)
	An empirical analysis of changes in credit rating properties: Timeliness, accuracy and volatility	Minimizes the cost of information collection.	(Cheng, & Neamtiu, 2009)
2007	Credit rating agencies in capital markets: A review of research evidence on selected criticisms of the agencies.	Assesses the institution for their current and future situations	(Frost, 2007)
2002	An Assessment of Malta's sovereign credit rating.	Helps countries and governments to improve financial markets and economy.	(Grima, 2002)
1997	Differences of opinion and selection bias in the credit rating industry	Assists investors and creditors to understand the level of risk in the investment	(Cantor, & Packer, 1997)
1995	The credit rating industry	Provides uniformity to the market and provides comparisons between organizations.	(Cantor, & Packer, 1995)
1992	The international rating game: An analysis of the liability of rating agencies in Europe, England, and the USA	Provides standard scale to compare companies with each other.	(Ebenroth, & Dillon Jr, 1992)

It is evident from the above review of previous literature that previous studies focus on evaluating the characteristics and outcomes of CRAs by focusing only on informational, financial, and regulatory benefits of CRAs such as decreasing costs, providing information to investors and other interested parties, and analyzing abilities and financial information of organizations. Moreover, most of the previous took place in developed countries and studied well-established CRAs, operating for long periods, that their outcomes and performance can be readily assessed. Accordingly, it is not easy to generalize the results of these studies to growing markets in developing countries like Saudi Arabia, in which the CRA is only started functioning and is still in its infancy stage. Therefore, it is preferable first to evaluate the acceptability of CRAs and perceptions of entrepreneurs and other stakeholders towards the services provided by CRAs before evaluating their performance and outcomes. Therefore, the present study contributes to the literature by identifying critical factors that contribute to the adoption and success of CRAs in a developing country like Saudi Arabia. In this regard, the study investigated the effect of five factors, namely, creditability, clarity, competence, communications, and customer services, which are rarely investigated in one study in the previous literature. Such contribution may pave the way for other studies to investigate these factors more deeply in other settings to assist decision-makers and entrepreneurs to benefit from CRAs adequately.

3. Research Objective and Methodology

This study aimed to examine the entrepreneur's opinion towards credit rating in Saudi Arabia. The questionnaire was extracted from the seminal work of Duff and Einig (2009). The questionnaire measures the entrepreneur's opinion towards CRAs in the financial market and the level of knowledge of the critical parties about CRA's (SIMAH's) role. Different validity checks were applied before adopting the questionnaire into the research, and later amendments were appended accordingly. Firstly, it serves the research objectives and covers the dimensions that need to be covered by the study. Secondly, experts checked it for the face validity of the questionnaire to be used in Saudi Arabia; no changes were suggested. Thirdly it was the most cited questionnaire on the subject and used in many recent studies (Pretorius & Botha, 2020; Smyth, Cole, & Fields, 2020; Aktan, Çelik, Abdulla, & Alshakhoori, 2019; Sajjad & Zakaria, 2018; Uslu, 2017). Finally, the questionnaire was published in one of the

top journals, and the authors are well known, and the questionnaires are available online and cost-free. The items measured by a five-point Likert scale start with response categories ranging from strongly agree (given a code of 5) to strongly disagree (given a code of 1).

The sample of 210 participants included entrepreneurs, business incubator managers, venture capitalists, angel investors, bankers, investors, university professors, business incubator employees, and others involved in the entrepreneurial ecosystem in Saudi Arabia. A judgmental sampling technique was employed. Multiple criteria were applied to select the respondents for this research. Firstly, the respondent must be familiar with the local entrepreneurial ecosystem and the role of CRAs in the economy, and credit rating processes adopted by CRAs. Therefore, efforts were made to ensure that all respondents know CRAs and consider the Saudi Credit Rating Agency (SIMAH). All faculty members who participated in this survey had a doctoral degree in finance and have taught accounting and finance-related courses, including money and banking, finance principles, financial management, derivatives, insurance, portfolio management, and analysis of financial statements. Secondly, respondents must be at least a graduate, preferably in the business discipline. Many doctors and engineers also participated in the survey having an MBA degree with a major in finance, but all of them are entrepreneurs and have already started their ventures or are in the process of starting their ventures. Although no gender-based quota was allocated, all efforts were made to make the sample all-inclusive. Thirdly, it is worth mentioning that the researcher approached the experts and investors from a larger population to extract pertinent findings related to the research subject. All efforts were made to select the respondents based on their level of involvement in the local ecosystem and willingness to participate. Sampling focused on randomizing the education, profession, age, and gender (N = 210). Table 3 presents the demographic data of the respondents.

Table 3. Respondent's demographic data

Variable	Response Category	Frequency	Percent
Gender	Male	189	10.1%
	Female	21	89.9%
Age	Up to 24 years	32	15.2%
	25-34 years	104	49.5%
	Above 35 years	74	35.3%
Education	Master's degree	32	15.2%
	Bachelor's degree	116	55.2%
	Diploma	62	30.0%
Profession	Entrepreneurs, Startup founders	122	58.0%
	Banker / Insurance / financial services	47	22.3%
	Venture Capitalists/ Angel Investors/Incubators	24	11.4%
	Academicians / Researchers	17	9.0%

3. Results and Discussion

Data were analyzed in many systematic stages. Firstly, respondent's profiles were analyzed to see data was collected from different backgrounds. Secondly, it was analyzed using descriptive analyses using frequency distribution, and finally, it was analyzed using Exploratory Factor Analyses (EFA). For this research, EFA was considered appropriate based on three reasons. Firstly, EFA is used where there are no pre-conceived theories or expectations, and the nature of research is exploratory; therefore, EFA was considered more suitable. Secondly, EFA uncovers the underlying structure of relatively large variables (Hair, Anderson, Tatham & Black, 2006). Finally, EFA was also successfully adopted in an earlier study on credit rating agencies (Duff and Einig, 2009). All factor analyses were performed using the Principal Factor Analysis extraction method with the Varimax rotation method. The factor loading criteria were applied, which required that (a) a factor must have at least three salient item loadings greater than 0.3, (b) individual items must have at least one-factor loading greater than 0.3, (c) any item loading on more than one factor when the final solution is obtained will be placed only in the factor on which it loads most highly (Hair et al., 2006).

The collected data was analyzed for the missing values, and the missing values were corrected. The number of missing values was not significant, there was a missing value found in some questions, and these missing values were fixed by assigning the neutral value to the responses. All questions were analyzed on normality tests for factor analyses as all questions were found normally distributed.

Analysis of 44 items related to the credit rating agency was factor analyzed using the Principal Factor Analysis extraction method with Varimax rotation method, yielded a five-factor solution, to which various criteria were then applied for refinement. Initially, the solution was examined to determine whether all the factors satisfied the Kaiser criterion (eigenvalues >1), and they did. Secondly, the resulting scree plot was examined from which considerable discontinuity after factor three emerged, suggesting a three-factor solution. On a final reading of the individual items for coherence, no doubts arose concerning the coherence of the factors. All the items loading on each separate factor were found to cohere to some degree, and therefore they were included in their respective factors. Table 4 shows exploratory factor analysis for critical success factors for credit rating agencies in Saudi Arabia.

The analyses resulted in a final five-factor solution, comprised of 44 items, all with communality values greater than 0.3. No item was dropped during the Exploratory Factor Analysis. Bartlett's test of Sphericity was significant, and the Kaiser-Meyer-Olkin measure of sampling adequacy is far greater than 0.6, namely KMO = 0.944. This means that the variables correlate to each other, which is needed to find an underlying factor that represents a grouping of variables (Burn & Burns, 2008; Coakes, 2013; Hejase et al., 2014). Having a suitable KMO for the data shows that the data was suitable for factor analysis. The questionnaire contained 44 questions of different aspects; these questions showed that the concern of the CRAs and the most critical factors are five, and these aspects are (Credibility, Clarity, Competence, Communications, and Customer Services). The analysis conducted (see Table 4) has shown each item against the factor with the highest likelihood occurrence.

Factor 1 had an eigenvalue of 26.36, and it accounted for 59.9% of the cumulative variance. It had loadings on 21 items. This factor was labeled as 'Credibility.' Factor 2 had an eigenvalue of 2.34, and it accounted for 62.3% of the cumulative variance with loadings on nine items. This factor has been labeled as 'Clarity.' Factor 3 had an eigenvalue of 1.84, and it accounted for 64.1 % of the cumulative variance. This factor has been labeled as 'Competence.' Factor 4 had an eigenvalue of 1.33, and it accounted for 67.1 % of the cumulative variance. This factor has been labeled as 'Communications.' Finally, factor 5 had an eigenvalue of 1.21, accounting for 69.89 % of the cumulative variance. This factor has been labeled as 'Customer Services.'

Table 4. EFA - Critical Success Factor for Credit Rating Agencies

Items	Factors				
	Credibility	Clarity	Competence	Communications	Customer Services
CRA is credible to third parties	0.76				
CRA operates to high ethical standards	0.71				
CRA operates to the highest standards of integrity	0.69				
CRA is highly competent	0.66				
CRA is conscientious	0.66				
CRA rating methodology is robust	0.65				

CRA is proactive in its ratings	0.64				
CRA ratings are accurate	0.61				
CRA rating methodology is consistent across the sector	0.53				
CRA outputs/reports are factually correct	0.58				
CRA adjusts its ratings on a timely basis	0.51				
CRA analyst is actively involved in the rating process		0.61			
CRA analyst is very knowledgeable about an issuer's industry		0.61			
CRA analysts' benefits are not linked to the issuer's revenue		0.61			
CRA publishes all assumptions and methods relevant to its decisions		0.55			
CRA keep issuers, investors, and market participants well informed about rating developments		0.55			
CRA analyst is keen to understand details about the issuer's organization		0.54			
CRA analysts' promotion prospects are not dependent on their ability to generate ancillary		0.52			
CRA and issuers keep informed each other about the latest developments		0.51			
CRA analysts should not change repeatedly		0.45			
CRA regularly evaluates the performance of its staff			0.65		
CRA and issuer keep each other informed about what is going on			0.64		
CRA employs a well-qualified and educated staff			0.61		
CRA team and an issuer have frequent communications			0.63		
CRA and issuer's relationship is based on mutual trust			0.59		
CRA and investors have a high level of trust			0.58		
CRA staff undertake regular professional development			0.57		
CRA staff have an appropriate workload			0.57		
CRA makes a genuine effort to resolve problems (relationship issues)			0.56		
CRA rating take cyclicity into account			0.53		
CRA communicates well to issuers its targets for an issuer's performance (upgrades)				0.72	
CRA communicates well to investors its targets for an issuer's performance (upgrades)				0.71	
CRA allows issuers a 'right of appeal' to correct factual errors and misrepresentations				0.71	
Investors well understand CRA's methodologies				0.65	
Issuers well understand CRA's methodologies				0.62	
CRA can negotiate discounts for frequent issuers				0.61	
CRA's publications explain its methodology to investors and others				0.62	
CRA employs staff with adequate experience				0.57	
CRA analyst provides an issuer with individual attention				0.52	
CRA regularly conducts client service review meetings					0.73
CRA analyst regularly meets with an issuer's key personnel to identify					0.72
CRA analyst is easily contactable by telephone/e-mail by issuers					0.69
CRA discloses a detailed fee scheme to potential issuers					0.65
CRA and issuers have a high level of trust					0.55

Conclusions

This research aimed to examine the entrepreneur's opinions towards their credit rating and CRA in Saudi Arabia. It also involved problems faced by entrepreneurs in getting their credit facilities from the local financial markets. The study has adopted the questionnaire from pioneering research on CRAs by Duff and Einig (2009). A sample of 210 respondents participated in this survey comprising entrepreneurs, venture capitalists, angel investors, business incubator employees, bankers, university professors, engineers, doctors, and other professionals. Descriptive statistics and Exploratory Factor Analyses were used to analyze the data. Findings show five critical factors are affecting CRAs in Saudi Arabia, i.e., (1) Credibility, (2) Clarity, (3) Competence, (4) Communications, and (5) Customer Services. Factor 1 was labeled as 'Credibility.' It reflects that credibility is the most critical factor in the credit rating business (Jollineau, Tanlu, & Winn, 2014). Most likely, all stakeholders in the financial market seek accurate information to make the right decision, which makes the credibility of the information provided the most profound concern. Therefore, credit rating agencies provide accurately and trusted information (Siddiqui & Siddiqui, 2015). Factor 2 was named 'Clarity.' It reflects the second most important factor in credit rating businesses. The clarity and transparency of rating processes are the key to the credit rating business (de Meijer, & Saaf, 2008; Krishnan, Mukherji, & Basu, 2020) and must be prepared by high standards of professionalism. Factor 3 was labeled as 'Competence.' Credit rating is an investor service, and a rating agency is expected to maintain the highest possible level of analytical competence and integrity (Kumar & Rao, 2012), and issuers also tend to view the competence of CRA analytic staff as a critical component of rating quality (Duff & Einig, 2015). Factor 4 was labeled as 'Communications.' The communication conducted is weak between the CRA and the beneficiary. The analysis provided could be missing critical information which will affect the decision-makers and the decisions made toward the company (Moloney, 2011). Factor 5 was marked as 'Customer Services.' Positive relationships between the CRAs and their clients will help the value and strength of the information provided. The relationship factor shows how the respondents see the importance of relationships between the CRAs and their clients. All five factors mentioned above are in line with the findings of earlier research.

The study results add to the literature about CRAs by first identifying critical factors that facilitate acceptance and success of CRAs, relevant to developing countries like KSA. Moreover, the study ranked these factors in terms of their effect and importance to entrepreneurs. Investigation of these factors is lacking in the previous studies, especially those conducted in developing countries. The paper highlights important factors that can assist in setting performance standards of CRAs. Therefore, scientists and researchers can benefit from this study by building on these factors in future studies to show if they have similar effects in other countries and obtain larger samples from these countries to generalize their effect on CRAs decisions and performance. It would also be interesting to investigate how the effect of these factors is different among different sizes and structures of CRAs. The study presents several recommendations to different stakeholders. Firstly, government agencies should understand that credit rating agencies play a pivotal role in the financial deepening of local financial markets and should get a separate set of laws and regulations for new startups and entrepreneurs. Furthermore, CRA in Saudi Arabia should enhance their creditability, clarity, and transparency, staff competence for financial and credit analyses, communications, and customer services. Being in monopolistic condition and lack of competition may inversely affect CRA's critical factors, especially credibility and customer services. Therefore, ministries eliminate substantial obstacles and develop more flexible rules and regulations for the credit rating industry. Secondly, there is a need to improve the awareness and understanding of 'credit rating culture.' SIMAH has partially achieved this through indirect sources, but there is a need to offer awareness sessions through universities, especially business schools teaching capital market and financial management courses. In addition, there should be seamless efforts to make credit rating part of the business school's curriculum. This can be achieved in consultation with the ministry of education to re-organize the finance courses in all universities/business schools to focus more on local capital markets and the role of CRAs in financial markets.

Finally, managers at CRAs should also improve their commitments to get the customers' confidence for CRA's credibility, clarity, competence, communications, and customer services.

This research is an outcome of overcoming many limitations. These limitations include lack of resources relevant to credit rating in Saudi Arabia, availability of limited credit rating literature, and general know-how in Saudi Arabia. Moreover, the difficulty of accessing credit rating experts from all over the Kingdom is another limitation. Therefore, findings must be considered cautiously and cannot be generalized. Notwithstanding, that the outcomes are essential as an eye-opener to researchers and financial professionals.

References

- Aktan, B., Çelik, Ş., Abdulla, Y., & Alshakhoori, N. (2019). The impact of credit ratings on capital structure. *ISRA International Journal of Islamic Finance*, 11(2) <http://doi.org/10.1108/ijif-03-2018-0028>
- Alessi, C., Wolverson, R., & Sergie, M. A. (2013). The credit rating controversy. Council on foreign relations.
- Ashcraft, A., & Duffie, D. (2006). Systemic Dynamics in the Federal Funds Market. Federal Reserve Bank of New York. https://www.newyorkfed.org/medialibrary/media/newsevents/events/research/2006/0518-slides_duffie.pdf
- Bannier, C. E., & Hirsch, C. W. (2010). The economic function of credit rating agencies—What does the Watchlist tell us? *Journal of Banking & Finance*, 34(12), 3037-3049. <https://doi.org/10.1016/j.jbankfin.2010.07.002>
- Becker, B., & Milbourn, T. (2008). Reputation and competition: evidence from the credit rating industry. Harvard Business School.
- Behr, P., & Güttler, A. (2008). The informational content of unsolicited ratings. *Journal of Banking & Finance*, 32(4), 587-599. <https://doi.org/10.1016/j.jbankfin.2007.04.021>
- Burns, R.B., & Burns, R.A. (2008). *Business Research Methods and Statistics Using SPSS*. London: SAGE Publications Ltd.
- Byoun, S., Han, S. H., & Shin, Y. S. (2020). Does the nationally recognized statistical rating organization certification matter for Japanese credit rating agencies? *Journal of Financial Markets*, 100585 <https://doi.org/10.1016/j.finmar.2020.100585>
- Cantor, R., & Packer, F. (1995). The credit rating industry. *The Journal of Fixed Income*, 5(3), 10-34.
- Cantor, R., & Packer, F. (1997). Differences of opinion and selection bias in the credit rating industry. *Journal of Banking & Finance*, 21(10), 1395-1417.
- Cheng, M., & Neamtui, M. (2009). An empirical analysis of changes in credit rating properties: Timeliness, accuracy and volatility. *Journal of Accounting and Economics*, 47(1-2), 108-130. <https://doi.org/10.1016/j.jacceco.2008.11.001>
- Coakes, S.J. (2013). *SPSS Version 20.0 for Windows: Analysis without Anguish*. Milton, Queensland: John Wiley & Sons Australia, Ltd.
- de Meijer, C. R., & Saaf, M. H. (2008). The credit crunch and credit rating agencies: Are they really striving towards more transparency?. *Journal of Securities Law, Regulation & Compliance*, 1(4),
- Driss, H., Massoud, N., & Roberts, G. S. (2019). Are credit rating agencies still relevant? Evidence on certification from Moody's credit watches. *Journal of Corporate Finance*, 59, 119-141. <https://doi.org/10.1016/j.jcorpfin.2016.08.003>
- Duff, A., & Einig, S. (2015). Debt issuer: Credit rating agency relations and the trinity of solicitude: An empirical study of the role of commitment. *Journal of business ethics*, 129(3), 553-569. <https://doi.org/10.1007/s10551-014-2175-y>
- Ebenroth, C. T., & Dillon Jr, T. J. (1992). The international rating game: An analysis of the liability of rating agencies in Europe, England, and the United States. *Law & Pol'y Int'l Bus.*, 24, 783.
- Einig, S. E. (2008). Financial managers', institutional investors' and other interested parties' perception of credit rating agencies and rating quality University of the West of Scotland.
- Ekins, E. E., Calabria, M. A., & Brown, C. O. (2011). Regulation, market structure, and role of the credit rating agencies. In APSA 2011 Annual Meeting Paper.
- Ellis, N. S., Fairchild, L. M., & D'Souza, F. (2011). Is imposing liability on credit rating agencies a good idea: Credit rating agency reform in the aftermath of the global financial crisis. *Stan. JL Bus. & Fin.*, 17, 175.
- Finnerty, J. D., Miller, C. D., & Chen, R. R. (2013). The impact of credit rating announcements on credit default swap spreads. *Journal of Banking & Finance*, 37(6), 2011-2030.
- Fong, M. W. (2018). China's online peer-to-peer (P2P) lending platforms. In *The Digitization of Business in China* (pp. 43-74). Palgrave Macmillan, Cham.
- Frost, C. A. (2007). Credit rating agencies in capital markets: A review of research evidence on selected criticisms of the agencies. *Journal of Accounting, Auditing & Finance*, 22(3), 469-492. <https://doi.org/10.1177/0148558X0702200306>
- Greer, R. A. (2016). Local government risk assessment: The effect of government type on credit rating decisions in Texas. *Public Budgeting & Finance*, 36(2), 70-90.
- Grima, M. (2002). An Assessment of Malta's Sovereign Credit Rating. *Bank< Valletta>: Bank of Valletta Review*, (25), 30-50.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. (2006). *Multivariate data analysis*. Uppersaddle River.
- Hejase, A.J., & Hejase, J.H. (2013). *Research Methods: A Practical Approach for Business Students*. 2nd ed. Philadelphia, PA: Masadir Inc.

- Hejase, H.J., Haddad, Z., Hamdar, B., Al Ali, R., Hejase, A.J., & Beyrouti, N. (2014). Knowledge Sharing: Assessment of Factors Affecting Employee' Motivation and Behavior in the Lebanese Organizations. *Journal of Scientific Research & Reports*, 3(12), 1549-1593. <https://doi.org/10.9734/JSRR/2014/8107>
- Holthausen, R. W., & Leftwich, R. W. (1986). The effect of bond rating changes on common stock prices. *Journal of Financial Economics*, 17(1), 57-89.
- Jollineau, S. J., Tanlu, L. J., & Winn, A. (2014). Evaluating proposed remedies for credit rating agency failures. *The Accounting Review*, 89(4), 1399-1420. <https://doi.org/10.2308/accr-50721>
- Jorge, J. (2019). Feedback effects between credit ratings and financial markets. *Economic Modelling*, 80, 328-338. <https://doi.org/10.1016/j.econmod.2018.11.019>
- Kang, M., & Ausloos, M. (2017). An inverse problem study: credit risk ratings as a determinant of corporate governance and capital structure in emerging markets: evidence from Chinese listed companies. *Economies*, 5(4), 47.
- Keenan, S., Fons, J., & Carty, L. (1998). A historical analysis of Moody's Watchlist. Moody's Investors Service.
- Kinato, H. A. (2017). The Impact of Credit Rating on FDI Attraction into Africa. <https://thesis.eur.nl/pub/42573>
- Krishnan, K., Mukherji, A., & Basu, S. (2020). Market responses to increased transparency: An Indian narrative. *International Review of Economics & Finance*, 69, 663-677.
- Kumar, K. V., & RAO, S. H. (2012). Credit Rating-Role in Modern Financial System. *International Journal of Marketing, Financial Services & Management Research*, 1(8), 126-138.
- Madegowda, J. (2010). Working of Credit Rating Agencies in India: An Analysis of Investors' Perception. *IUP Journal of Behavioral Finance*, 7.
- Manso, G. (2013). Feedback effects of credit ratings. *Journal of Financial Economics*, 109(2), 535-548.
- Mateev, M. (2009). Determinants of foreign direct investment in Central and Southeastern Europe: New empirical tests. *Oxford Journal*, 8(1), 133-149.
- Mirović, V., Pavlović, N., & Puškarić, A. (2014). Asset Securitization as a Means of Tourism Financing. *Economic Insights-Trends & Challenges*, 66(2).
- Mutize, M., & Nkhalamba, M. P. (2021). International credit rating agencies in Africa: Perceptions, trends and challenges. *International Journal of Sustainable Economy*, 13(1), 55-71. . <http://doi.org/10.1504/IJSE.2021.113303>
- Niedziolka, P. (2019). The Visegrád Group Countries' Ratings–Do the Credit Rating Agencies Make the Decisions Independently or Piggyback Themselves?. *Journal of Economics and Business*, 2(2).
- Pretorius, M., & Botha, I. (2020). Leads and Lags in African Sovereign Credit Ratings. *Journal of African Business*, 1-19.
- Rahim, M. M. (2010). Credit rating agencies' roles have to be reassessed. *Law and Financial Markets Review*, 4(4), 433-438.
- Rhee, R. J. (2015). Why credit rating agencies exist. *Economic Notes: Review of Banking, Finance and Monetary Economics*, 44(2), 161-176. <https://doi.org/10.1111/ecno.12034>
- Sajjad, F., & Zakaria, M. (2018). Credit rating as a mechanism for capital structure optimization: Empirical evidence from panel data analysis. *International Journal of Financial Studies*, 6(1), 13. RePEc:gam:ijfss:v:6:y:2018:i:1:p:13-d:128713
- Sethuraman, M. (2019). The effect of reputation shocks to rating agencies on corporate disclosures. *The Accounting Review*, 94(1), 299-326. <https://doi.org/10.2308/accr-52114>
- Siddiqui, A., & Siddiqui, K. (2015). Credit-Rating Business in Pakistan: Norms & Practices. *Sci. Int. (Lahore)*, 27(5), 4597-4602.
- SIMAH Saudi Credit Rating Agency <https://www.simah.com/en/personal/pages/default.aspx>
- Smyth, S., Cole, I., & Fields, D. (2020). From gatekeepers to gateway constructors: Credit rating agencies and the financialization of housing associations. *Critical Perspectives on Accounting*, 71, 102093.
- Smyth, S., Cole, I., & Fields, D. (2020). From gatekeepers to gateway constructors: Credit rating agencies and the financialization of housing associations. *Critical Perspectives on Accounting*, 71 <http://doi.org/10.1016/j.cpa.2019.102093>
- Sood, P., Mays, M. M., & Lindfield, M. R. (2012). Subnational Finance for Infrastructure: Potential Roles and Opportunities for ADB. Accessed from <https://www.think-asia.org/bitstream/handle/11540/1384/adb-wp20-subnational-finance-infrastructure.pdf?sequence=1>
- Tang, L., Peytcheva, M., & Li, P. (2020). Investor-paid ratings and conflicts of interest. *Journal of Business Ethics*, 163(2), 365-378.
- Tullao Jr, T. S., Cabuay, C. J. R., & Hofileña, D. S. (2018). Is a Regional Credit Rating Agency for the ASEAN Feasible?. *DLSU Business & Economics Review*, 27(2), 35-50. <http://dlsu-ber.com/wp-content/uploads/2018/03/4Tullao-011818.pdf>
- Uslu, Ç. L. (2017). Examining the Behavior of Credit Rating Agencies Post 2008 Economic Turmoil. *International Journal of Management and Economics*, 53(4), 61-76. <https://doi.org/10.1515/ijme-2017-0026>
- White, L. J. (2013). Credit rating agencies: An overview. *Annu. Rev. Financ. Econ.*, 5(1), 93-122. <https://doi.org/10.1146/annurev-financial-110112-120942>
- White, L. J. (2019). Using the tools of industrial organization to illuminate the credit rating industry. *Japanese Economic Review*, 70(3), 367-374. <https://doi.org/10.1111/jere.12238>

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THE DEGREE OF FISCAL DECENTRALIZATION IN EUROPEAN UNION COUNTRIES IN DIFFERENT STAGES OF THE ECONOMIC CYCLE

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Abstract. The debate surrounding fiscal decentralization is revived in times of threats to sustainable development whose effects are first experienced at the decentralized (local) level and are then transferred to the central level. The extent to which the management of public funds is decentralized is determined mainly by a country's legal system, but also by economic, political and historical factors. A balanced relationship between central control and local autonomy in fiscal management can improve a country's economic performance. This factor could play a key role in planning effective measures to minimize the adverse consequences of the economic recession caused by the Covid-19 pandemic. The aim of this study was to evaluate the degree of fiscal decentralization in European Union (EU) countries, to identify groups of EU Member States characterized by a similar degree of fiscal decentralization, and to describe their economic performance. The degree of fiscal decentralization was evaluated based on local government revenues as a percentage of the GDP in EU Member States. Agglomerative clustering and k-means clustering methods were used to identify groups of countries with similar degrees of fiscal decentralization. The economic performance of countries in each group was evaluated with the use of standard macroeconomic indicators. Three groups of countries with similar degrees of fiscal decentralization were identified. The most decentralized countries were Denmark, Sweden and Finland. These countries were characterized by the highest levels of economic growth. Economic growth was lowest in the countries that joined the EU after 2004. These countries were characterized by the relatively highest inflation rates and the lowest average household incomes.

Keywords: decentralization, local finance, local government, European Union, local sustainability

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Additional disciplines: law, political sciences

1. Introduction

Despite the adoption of the *acquis communautaire* and a broad range of common policies and legal measures, the Member States of the European Union (EU) differ in the degree of fiscal decentralization. Decentralization is shaped by a variety of political, economic, social and historical factors. In the economic literature, the debate surrounding fiscal decentralization has continued for many years, and it is intensified in times of economic and financial crises which increase the demand for state intervention in the national economy. The significance of this problem has also been recognized in the context of the common market due to close economic and financial ties between EU Member States and the need for consolidated actions to mitigate the consequences of economic downturns (Szymańska, 2018, pp. 634-635).

Preliminary statistical data on the economic consequences of the Covid-19 pandemic indicate that fiscal decentralization is a highly valid concern because a healthy balance between central control and local autonomy can be an effective tool in hastening economic recovery (Malkina, 2021). Local measures are generally more effective, and they can exert a positive influence on the economic growth of the entire country. However, in an attempt to alleviate the current recession, many countries have undertaken active steps to increase fiscal centralization by introducing various instruments to coordinate local budgets.

The degree of fiscal decentralization should be examined in the first step of the analytical process. Such attempts have been made in the present study which is a continuation of previous research on fiscal decentralization. As noted by many authors, this area of research continues to attract significant interest, but it remains insufficiently investigated.

The aim of this study was to determine the degree of fiscal decentralization in the EU Member States, to identify groups of countries with a similar degree of decentralization, and to characterize their economic performance. The analyzed period was 2004 to 2019. The degree of fiscal decentralization was determined, and groups of countries with similar levels of decentralization were identified based on local government revenues as a percentage of GDP. The analyzed countries were grouped with the use of the k-means clustering method. The potential number of countries in each group was defined by agglomerative clustering, and the results of the analysis were presented in a dendrogram. The economic performance of countries in each group was evaluated with the use of standard macroeconomic indicators. It should be emphasized that in other research conducted all over the world there is no direct evidence of a direct relationship between the degree of decentralization and the economic situation of countries. Characterization of the economies of countries grouped according to the scope of decentralization and their comparison with each other seems to be one of the basic methods of achieving the assumed research aim.

The article contains several chapters. The first chapter reviews the literature on fiscal decentralization and theories relating to public finance management in different stages of the economic cycle. The following two chapters describe the research methodology and present the results of the conducted study. In the Discussion section, the present findings were confronted with the theoretical approaches to fiscal decentralization described in the literature. Conclusions were formulated and the directions for further research were described in the last chapter.

2. Theoretical background

In developed economies around the world, local governments play an important role in governance, controlling public resources and income redistribution in the form of public goods and services. The theoretical and practical aspects of fiscal decentralization have been analyzed in the literature for decades (Schneider, 2003, p. 37; Hansjörg & Junghun, 2016). Decentralization policies are being introduced around the world, including in developing and less developed countries, and the interest in this issue continues to increase (Gadenne & Singhal, 2014, p. 583-585). Decentralization is a global trend, and to a certain extent, its implementation has been

triggered by globalization and greater economic openness of many countries (de Mello, 2005, p. 13). These trends are particularly pronounced in the EU, where the single market concept has been fully implemented in practice.

The influence of fiscal decentralization on the economy, society and policy-making has been thoroughly analyzed in the literature. Fiscal decentralization has an extensive theoretical framework, but the conclusions formulated by many researchers are often ambiguous or even mutually exclusive. This is one of the reasons why decentralization continues to attract significant interest. The relevant processes are also widely researched because decentralization delivers numerous benefits that can stabilize national economies during downturns in the business cycle. These advantages have been highlighted by first- (Musgrave 1959; Oates 1972), and second-generation (see Weingast 2014, pp. 14-25) fiscal federalism theories which postulate that adequate financial relations between different levels of state administration can counteract economic crises and minimize their consequences.

Two approaches to explaining the potential effects of decentralization on the economy have been proposed in the vast literature on the subject. The first approach postulates that more extensive decentralization increases the effectiveness of the measures undertaken at the lowest level of governance. Local governments are better acquainted with local affairs, needs and preferences concerning public spending. This knowledge can stimulate economic growth that drives the development of entire countries. As a result, greater decentralization can improve a country's economic stability, create new opportunities for investment, increase the value of investments, GDP and human capital efficiency, stabilize prices, lower budget deficits, improve income redistribution, decrease unemployment and poverty, and promote regional convergence (Martinez-Vazquez & McNab, 2006, pp. 25-49; Sepulveda & Martinez-Vazquez, 2011, pp. 321-343; Kyriacou et al., 2015, pp. 89-90; Martinez-Vazquez et al., 2017, pp. 1100-1112).

The second approach makes a reference to the negative consequences of decentralization, namely phenomena that can diminish the positive effects of decentralization. This approach focuses on the risk of macroeconomic instability caused by transfers of financial resources to local governments. Local authorities can spend public funds irresponsibly or cut local taxes for political gain. Greater decentralization can also worsen local governments' financial condition and force them into debt if the transferred funds are not sufficient to cover statutory expenses. As a result, central debt can be transferred to the local level. Higher transfers from the central government can also increase taxes that are set at the central level. Decentralization can disrupt income convergence by decreasing regional flows of human and financial resources (Keen & Kotsogiannis, 2004, p. 405; Oates, 2008, p. 324; Martinez-Vazquez et al., 2017, pp. 1100-1112; Kargol-Wasiluk & Wildowicz-Giegiel, 2018, pp. 411-426).

Regardless of whether decentralization generates positive or negative consequences for the economy, a potential relationship exists between decentralization and a country's economic performance. Some researchers have commented on the absence of direct and empirically proven associations between decentralization and the economic performance of countries with different legal systems (Lago-Penas et al., 2011, p. 197), which can be largely attributed to difficulties in measuring the strength of such associations. Econometric models have been developed in an attempt to identify such relationships, but the resulting conclusions are always limited and bound by numerous constraints. Therefore, research studies often produce discrepant results that cannot be applied universally (Salmon, 2013, p. 93). Differences in the economic development, legal regulations and administrative systems of the compared countries further complicate such analyses.

To minimize the above problems, the data analyzed in this study covered a longer period of time, conclusions were formulated by analyzing groups of countries with a similar degree of fiscal decentralization, and a statistical approach was adopted (Salmon 2013, p. 100). It was assumed that EU countries have certain similarities, mainly because some of their fiscal policies have to be coordinated. European Union countries are also members of the International Monetary Fund, and they have to abide by the same regulations and undertake specific measures

during recession (Feld & Schnellenbach, 2011; Neyapti, 2013, 528-532; Ban & Gallagher 2015, pp. 137-138; Wildowicz-Giegiel, 2019, pp. 6110630). However, the EU Member States also differ in numerous respects which influence the degree of fiscal decentralization, including democratic maturity, economic convergence, as well as historical and political factors that affect the relations between central and local administration. These aspects were not analyzed in this study due to space constraints.

The above approach was adopted to evaluate selected trends in countries with different degrees of fiscal decentralization. The results can be used in further research dedicated to the problem.

3. Research objective and methodology

The degree of fiscal decentralization was evaluated based on the local revenue-to-GDP ratio in the EU Member States. The above indicator as well as the local spending-to-GDP ratio are the main measures of fiscal decentralization that are used by, among others, the OECD (OECD, 2020) and the World Bank (Ebel & Yilmaz, 2002, p. 6). The revenue-to-GDP ratio supports comparisons of the degree of decentralization in all countries around the world that are included in international statistical reports. However, the discussed indicator does not account for the extent to which local governments control the amount of collected revenues, for example by setting local tax rates. The revenue-to-GDP ratio was selected for this study because local government spending is a derivative of the revenues accumulated at the local level. Other variables were not considered because their inclusion would extend beyond the conceptual framework of this research.

The analyzed period was 2004 to 2020. The initial date marks the largest enlargement of the EU, and the end date was selected due to the availability of Eurostat data (Eurostat 2020). The period between 2004 and 2019 witnessed numerous crises and breakthrough events in the EU, including the global economic crisis that erupted at the end of the first decade of the 21st century, the Eurozone crisis, as well as political and social crises, including Brexit which was an unprecedented event in the history of the EU. The analyzed period also covers three multiannual financial frameworks in the EU.

The research hypothesis postulates that the EU Member States can be divided into groups of countries that are characterized by similar degrees of fiscal decentralization but different levels of economic growth.

Agglomerative clustering, a hierarchical clustering method, was applied in the first stage of the study to determine the potential number of groups with similar degrees of decentralization. The analysis relied on Ward's method, the most popular agglomerative clustering procedure that relies on a variance criterion to minimize total variance within clusters (Ward 1963; Murtagh & Legendre, 2014, pp. 274-295; Thalassinou et al. 2019, pp. 591-609). The results were used to develop a dendrogram presenting the structure of the analyzed data and the potential number of clusters (Tibshirani et al., 2001, 415-418; Roszko-Wójtowicz & Grzelak, 2021, pp. 103-138).

European Union countries were grouped with the involvement of the classification method which is used to detect similarities between groups within the same population (Jain, 2010, p. 654). The k-means clustering method is a popular variant of the above approach. This non-hierarchical method divides a population into several previously identified groups, where none of the elements in a given cluster belong to any other cluster (Małkowska et. al., 2021, pp. 325-355). k-clusters agglomerate objects that are most similar to one another and most different from objects in other clusters in terms of one or more parameters. Many variants of the k-means clustering method have been proposed, and in this study, objects were grouped based on the Euclidean distance from the centroid of each cluster. This method supported the identification of groups of EU countries characterized by similar degrees of decentralization. Data were processed statistically in the Statistica v. 13.3 program.

The economic performance of the identified groups of countries was evaluated with the use of standard macroeconomic indicators: GDP at market prices, economic growth (GDP growth at market prices), inflation rate (consumer price index), public deficit and public debt, average household income, and unemployment rate.

4. Results and discussion

The agglomerative clustering method was used to divide EU countries into three groups, and the cut-off point is presented in the dendrogram in Figure 1. The identified number of groups was characterized by the largest Euclidean distances between clusters. A more detailed analysis involving a larger number of smaller clusters would not support classification because the obtained groups would be increasingly similar. The k-means clustering method was applied in the next step of the analysis to sort Euclidean distances between three clusters and select cluster centroids at fixed intervals. Convergence was achieved already in the second iteration. The resulting groups of countries differed maximally in the degree of decentralization, and each cluster contained countries with the most similar levels of decentralization. The Euclidean distance between the first and the second group was 15.12, between the first and the third group – 20.74, and between the second and the third group – 5.66.

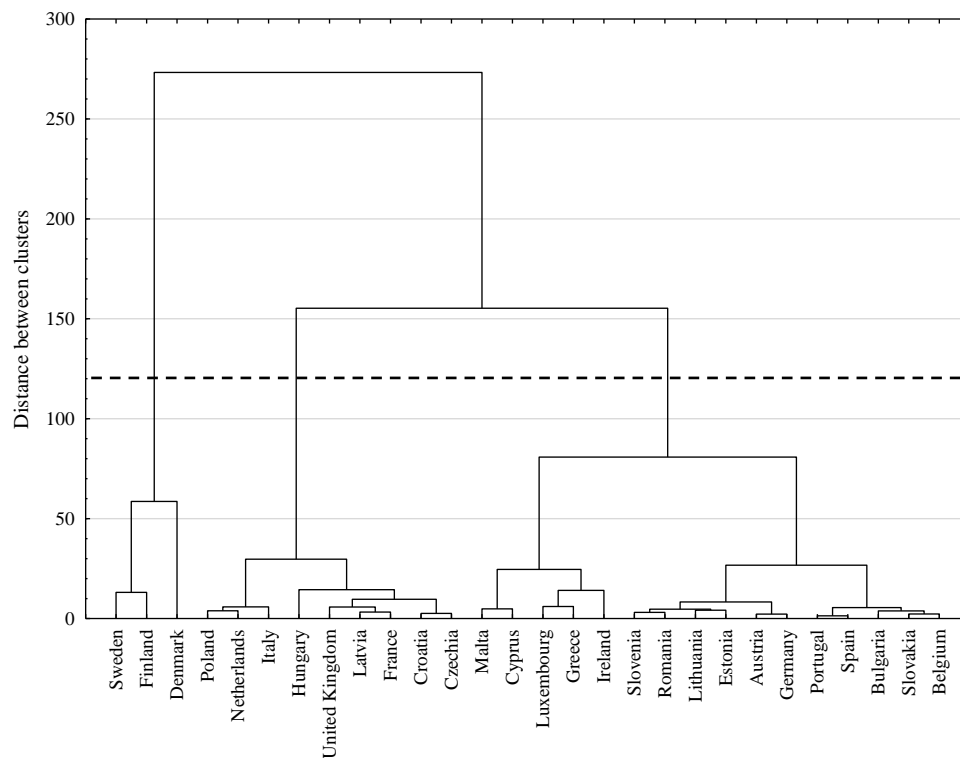


Figure 1. Dendrogram of the European Union countries based on the local revenue-to-GDP ratio in 2004-2009, calculated with the use of Ward's method and Euclidean distances. The line denotes the cut-off point for cluster analysis

Source: own calculations based on Eurostat (2020)

The first group of countries with the highest degree of decentralization was composed of Scandinavian countries: Denmark, Finland and Sweden (Table 1, Figure 2). The degree of decentralization measured by the local revenue-to-GDP ratio was determined at 26.2% on average in 2004-2019 and was relatively stable during the entire period of analysis, with two distinct evolutionary stages (Figure 2). The first stage covered 2004-2008, when the revenue-to-GDP ratio ranged from 24.2% to 24.8%. Beginning from 2009, the analyzed ratio increased to 26.9%

in consequence of the financial crisis, and it was maintained at a high and unprecedented level in the following years. A minor decreasing trend in the evaluated parameter was observed in the last years of the analysis.

The first group of countries was characterized by the highest economic growth relative to the remaining clusters. Average GDP growth reached 2.95%, and the average inflation rate was determined at 1.4%, which was the lowest value in the entire EU. These countries also enjoyed the most robust financial condition with an average budget surplus at 0.4% of GDP and the lowest public debt at 43.2% of GDP in the analyzed period. Household incomes were highest relative to the remaining groups of countries at EUR 25,476.6 on average. These countries were also characterized by the lowest average unemployment rate of 7.1%.

Table 1. Classification of the European Union countries based on the degree of fiscal decentralization in 2004-2019 and the average values of basic macroeconomic indicators

Countries / average macroeconomic indicators	Countries with the highest degree of decentralization	Countries with a moderate degree of decentralization	Countries with a lowest degree of decentralization
Countries	Denmark, Finland, Sweden	Czechia, Estonia, France, Croatia, Italy, Latvia, Lithuania, Hungary, Netherlands, Poland, Romania, Slovenia, United Kingdom	Belgium, Bulgaria, Germany, Ireland, Greece, Spain, Cyprus, Luxembourg, Malta, Austria, Portugal, Slovakia
GDP at market prices (€) and GDP growth (%)	285 563.2 2.95	621 522.2 2.95	442 992.8 2.51
consumer price index (%)	1.4	2.5	1.9
budget deficit / budget surplus (% in GDP)	0.4	-3.1	-2.7
public debt (% in GDP)	43.2	57.8	72.0
average household income (€)	25 476.6	11 918.9	17 461.6
unemployment rate (%)	7.1	8.2	9.4

Source: own calculations based on Eurostat (2020)

The second group was composed of 13 countries with a moderate degree of decentralization: Czechia, Estonia, France, Croatia, Italy, Latvia, Lithuania, Hungary, Netherlands, Poland, Romania, Slovenia, United Kingdom (Table 1, Figure 2). The average revenue-to-GDP ratio was determined at 11.1%. Similarly to the first group, the degree of decentralization increased in 2009, but a minor decrease in the evaluated parameter was observed in 2011, and fairly stable values were noted in the remaining years of the analysis.

Similarly to the first group of countries, average GDP growth in the second group reached 2.95%. These countries were characterized by the largest economies in terms of their GDP which was determined at EUR 621,522.2 million on average in the analyzed period. The second group of countries ranked last in terms of two macroeconomic indicators: the highest average inflation rate of 2.5% and the highest average budget deficit of -3.1% of GDP. These countries were also characterized by the lowest average household income of EUR 11,918.9. The remaining economic indicators were between minimum and maximum values: public debt was determined at 57.8% of GDP, and the average unemployment rate was 8.2%.

The third group of 12 countries was characterized by the lowest degree of decentralization in 2004-2019: Belgium, Bulgaria, Germany, Ireland, Greece, Spain, Cyprus, Luxembourg, Malta, Austria, Portugal, Slovakia (Table 1). The average local revenue-to-GDP ratio was 5.5% in the analyzed period (Figure 2). Unlike in the remaining groups, the degree of decentralization did not increase in 2009 or the following years (an increase of only 0.1% was noted in 2009), and it remained stable at 5.3-5.6%.

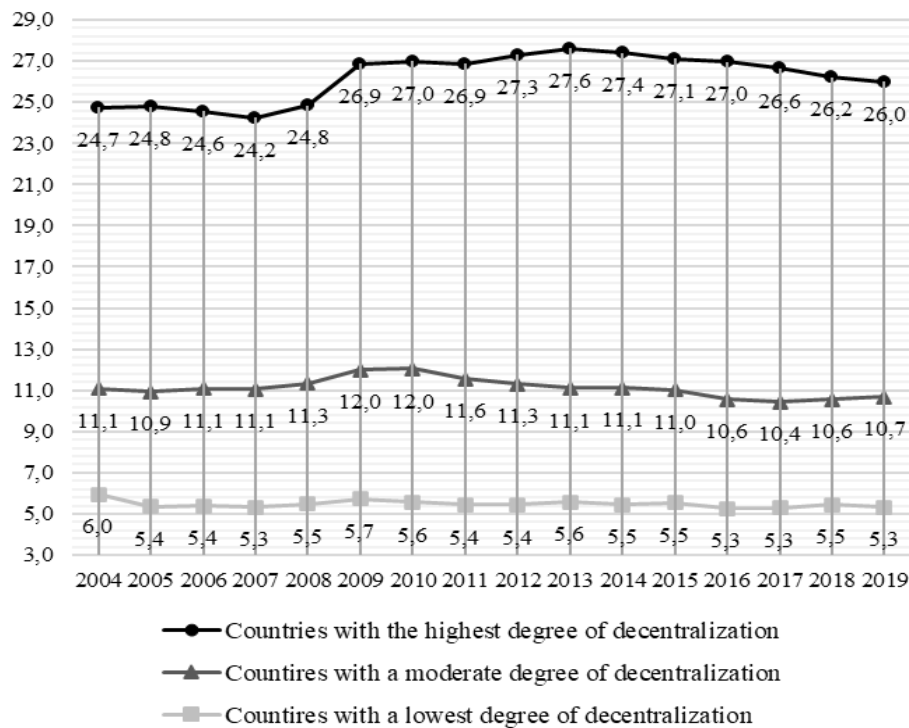


Figure 2. Average degree of fiscal decentralization based on the local revenue-to-GDP ratio in three clusters of EU countries in 2004-2019 (%)

Source: own calculations based on Eurostat (2020)

GDP growth was lowest in the third group of countries at only 2.51% on average. These countries were characterized by the highest average public debt which reached 72% of GDP and exceeded the EU debt limit by 12 percentage points. The average unemployment rate was determined at 9.4% and was highest in the EU. The remaining macroeconomic indicators assumed moderate values relative to the remaining groups. On average, the inflation rate reached 1.9%, budget deficit was determined at -2.7% of GDP, and household income was EUR 17,461.6. It should also be noted that the third group included countries where the Eurozone crisis had erupted and where severe consequences of economic recession persist to this day.

The presented analysis generated detailed information about fiscal decentralization in the EU countries. Three groups of countries with similar values of the local revenue-to-GDP ratio were identified. These countries are characterized not only by a similar degree of decentralization, but also by similar values of selected macroeconomic indicators.

The first group of countries with the highest degree of decentralization, i.e. Denmark, Finland and Sweden, deserve special attention. These countries belong to the most developed economies in the EU. Despite the absence of empirical data to confirm this observation, the results of this study validate other research findings which point to a positive, although indirect association between decentralization and economic growth (see Baskaran et al., 2016; Slavinskaitė, 2017, p. 754).

In the analyzed period, the highest values of most macroeconomic indicators were noted in the first group of countries. In this group, the degree of decentralization further increased in 2009 when the first symptoms of recession were experienced by European markets. The above did not result from a recession-induced decline in economic growth because GDP in the first group of countries returned to pre-crisis levels in 2010, and continued to increase in the following years. The example of Denmark, Finland and Sweden appears to confirm the postulates of first- and second-generation fiscal federalism theories, namely that decentralization has a positive impact on economic growth. However, the presence of such relationships requires in-depth analyses of local governments' tax powers and fiscal autonomy in the historical, political and legal context.

In the second and third of group countries, the degree of decentralization was two and three times lower, respectively, than in the first group, and the economic performance of those countries was also significantly lower. Second and third group countries were characterized by high inflation rates, high unemployment, high budget deficit and public debt, and lower household incomes. These observations confirm the presence of a potential relationship between decentralization and economic growth. During the global recession, a minor increase in decentralization was noted in second and third group countries, but it was lower than in the first group. However, after the recession, the degree of decentralization decreased below pre-crisis levels. In the third group of countries, the local revenue-to-GDP ratio did not increase significantly in the years after the financial crisis.

The results of the above analysis suggest that in countries with a higher degree of decentralization, local government powers were further expanded after the recession to combat the negative consequences of the economic crisis. The opposite strategy was implemented by countries with a low degree of decentralization. In the light of the fiscal federalism theory, these observations indicate that the economic crisis was exacerbated or prolonged in countries with a low degree of decentralization. This assumption is supported by the economic performance of third group countries which are still experiencing the adverse effects of the global recession.

Conclusions

The debate surrounding fiscal decentralization has continued since World War II. The interest in decentralization is usually revived in times of recession because some economic crises first affect local governments and are then transferred to the central level. A similar scenario can be expected in the coming years when the economic impact of the Covid-19 pandemic becomes apparent. The results of this study represent the first stage of analysis of the evolution of fiscal decentralization in EU countries, and the conclusions formulated based on the past experience can provide valuable inputs for economic practice.

Despite the fact that numerous measures are being undertaken by the EU to coordinate the Member States' fiscal policies, this study revealed considerable differences in their degree of decentralization. Three distinct groups of countries characterized by different degrees of decentralization and different levels of economic growth within the groups were identified. Therefore, the research hypothesis was validated.

There is no direct empirical evidence to confirm the presence of a relationship between the degree of fiscal decentralization and economic performance, but the results of this study validate the assumptions of fiscal federalism theories which postulate a positive association between these two factors. Countries with a higher degree of decentralization were characterized by higher economic growth, higher price stability, lower public debt, higher budget surplus or lower budget deficit, more effective redistribution of income and, consequently, lower unemployment. The opposite was observed in countries with a lower degree of decentralization, some of which were severely affected by the global economic crisis and continue to be plagued by macroeconomic instability.

An interesting conclusion that can be derived from the present findings is that in times of economic recession, the degree of decentralization tends to increase in countries where local authorities enjoy considerable fiscal autonomy. In these countries, local governments were probably tasked with some measures aiming to mitigate the crisis. The opposite was observed in countries with a lower degree of decentralization where this parameter did not change considerably during economic downturn. In the light of fiscal federalism theories, this is a negative phenomenon because local authorities are better acquainted with local needs and have the necessary tools to hasten economic recovery than the central government. An analysis of macroeconomic indicators in recent years suggests that similar trends can be expected in the upcoming economic crisis.

The current study and a review of the literature have confirmed that decentralization is a complex and multifaceted problem that will be further analyzed. The conducted research can provide a basis for numerous scientific hypotheses and inspire further investigations. In the future, attempts should be made to analyze the cause-effect relationship between the variables describing the degree of fiscal decentralization and economic growth in groups of EU countries or in individual cases. Other indicators of decentralization, including the degree of expenditure decentralization, tax autonomy at the local level, and the proportions of various types of expenditures and revenues in total government spending and receipts, can also be included in future analyses. Further research can involve political and legal analyses to assess the potential and real influence of EU regulations on the degree of decentralization in the Member States.

References

- Ban, C., & Gallagher, K. (2015). Recalibrating policy orthodoxy: The IMF since the great recession. *Governance*, 28(2), 131-146. <https://doi.org/10.1111/gove.12103>
- Baskaran, T., Feld, L. P., & Schnellenbach, J. (2016). Fiscal federalism, decentralization, and economic growth: a meta-analysis. *Economic Inquiry*, 54(3), 1445-1463. <https://doi.org/10.1111/ecin.12331>
- de Mello Jr, L. R. (2005). Globalization and fiscal federalism: does openness constrain subnational budget imbalances?. *Public Budgeting & Finance*, 25(1), 1-14. <https://doi.org/10.1111/j.0275-1100.2005.00351.x>
- Ebel, R. D., & Yilmaz, S. (2002). On the measurement and impact of fiscal decentralization. *Policy Research Working Paper*, 2809, World Bank.
- Eurostat (2020). Retrieved December 12, 2020 from <https://ec.europa.eu/eurostat/data/database>
- Feld, L. P., & Schnellenbach, J. (2011). Fiscal federalism and long-run macroeconomic performance: a survey of recent research. *Environment and Planning C: Government and Policy*, 29(2). <https://doi.org/10.1353/wp.2002.0016>
- Hansjörg, B., & Junghun, K. (Eds.). (2016). Fiscal federalism 2016 making decentralisation work: Making decentralisation work. OECD Publishing.
- Jain, A. K. (2010). Data clustering: 50 years beyond K-means. *Pattern recognition letters*, 31(8), 651-666. https://doi.org/10.1007/978-3-540-87479-9_3
- Kargol-Wasiluk, A., & Wildowicz-Giegiel, A. (2018). The quality of public finance in the light of fiscal governance concept: implications for the European Union countries. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 13(3), 411-426. <https://doi.org/10.24136/eq.2018.020>
- Keen, M. J., & Kotsogiannis, C. (2004). Tax competition in federations and the welfare consequences of decentralization. *Journal of Urban Economics*, 56(3), 397-407. <https://doi.org/10.1016/j.jue.2004.04.005>
- Kyriacou, A. P., Muinelo-Gallo, L., & Roca-Sagalés, O. (2015). Fiscal decentralization and regional disparities: The importance of good governance. *Papers in Regional Science*, 94(1), 89-107. <https://doi.org/10.1111/pirs.12061>

- Lago-Penas, I., Lago-Penas, S., & Martinez-Vazquez, J. (2011). The political and economic consequences of decentralization. *Environment and Planning C: Government and Policy*, 29, 197-203. <https://doi.org/10.1068/c2902ed>
- Malkina, M. Y. (2021). How the 2020 pandemic affected tax revenues in Russian regions?. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(2), 239–260. <https://doi.org/10.24136/eq.2021.009>
- Martinez-Vazquez, J., & McNab, R. M. (2006). Fiscal decentralization, macrostability, and growth. *Hacienda Pública Española/Review of Public Economics*, 179, 25-49.
- Małkowska, A., Urbaniec, M., & Kosała, M. (2021). The impact of digital transformation on European countries: insights from a comparative analysis. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(2), 325–355. <https://doi.org/10.24136/eq.2021.012>
- Martinez-Vazquez, J., Lago-Peñas, S., & Sacchi, A. (2017). The impact of fiscal decentralization: A survey. *Journal of Economic Surveys*, 31(4), 1095-1129. <https://doi.org/10.1111/joes.12182>
- Murtagh, F., & Legendre, P. (2014). Ward's hierarchical agglomerative clustering method: which algorithms implement Ward's criterion?. *Journal of classification*, 31(3), 274-295. <https://doi.org/10.1007/s00357-014-9161-z>
- Musgrave, R. (1959). *The theory of public finance*. New York: McGraw-Hill.
- Neyapti, B. (2013). Fiscal decentralization, fiscal rules and fiscal discipline. *Economics Letters*, 121(3), 528-532. <https://doi.org/10.1016/j.econlet.2013.10.006>
- Oates, W. (2008). On the evolution of fiscal federalism: Theory and institutions. *National Tax Journal*, 61(2). <https://doi.org/10.17310/ntj.2008.2.08>
- Oates, W. E. (1972). *Fiscal federalism*. New York: Harcourt Brace.
- OECD (2020). Fiscal Decentralisation Database. Retrieved January 2, 2021 from <https://www.oecd.org/tax/federalism/fiscal-decentralisation-database/>
- Roszkó-Wójtowicz, E., & Grzelak, M. M. (2021). Multi-dimensional analysis of regional investment attractiveness in Poland. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(1), 103–138. <https://doi.org/10.24136/eq.2021.004>
- Salmon, P. (2013). Decentralization and growth: what if the cross-jurisdiction approach had met a dead end?. *Constitutional Political Economy*, 24(2), 87-107. <https://dx.doi.org/10.1007/s10602-013-9137-8>
- Schneider, A. (2003). Decentralization: conceptualization and measurement. *Studies in comparative international development*, 38(3), 32-56. <http://dx.doi.org/10.1007/BF02686198>
- Sepulveda, C. F., & Martinez-Vazquez, J. (2011). The consequences of fiscal decentralization on poverty and income equality. *Environment and Planning C: Government and Policy*, 29(2), 321-343. <http://dx.doi.org/10.1068/c1033r>
- Slavinskaitė, N. (2017). Fiscal decentralization and economic growth in selected European countries. *Journal of Business Economics and Management*, 18(4), 745-757. <https://doi.org/10.3846/16111699.2017.1292312>
- Szymańska, A. (2018). National fiscal frameworks in the post-crisis European Union. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 13(4), 623-642. <https://doi.org/10.24136/eq.2018.030>
- Thalassinos, E., Cristea, M., & Noja, G. G. (2019). Measuring active ageing within the European Union: implications on economic development. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(4), 591–609. <https://doi.org/10.24136/eq.2019.028>
- Tibshirani, R., Walther, G., & Hastie, T. (2001). Estimating the number of clusters in a data set via the gap statistic. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 63(2), 411-423. <https://doi.org/10.1111/1467-9868.00293>
- Ward, J. H. (1963). Hierarchical grouping to optimize an objective function. *Journal of the American Statistical Association*, 58(301), 236-244. <https://doi.org/10.1080/01621459.1963.10500845>

Weingast, B. R. (2014). Second generation fiscal federalism: Political aspects of decentralization and economic development. *World Development*, 53, 14-25. <https://doi.org/10.1016/j.worlddev.2013.01.003>

Wildowicz-Giegiel, A. (2019). The role of independent fiscal councils in improving fiscal performance of the European Union countries . *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(4), 611–630. <https://doi.org/10.24136/eq.2019.029>

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DIFFERENTIATION IN LEVELS OF HUMAN CAPITAL AMONG SMALL CITIES IN WARMINSKO-MAZURSKIE VOIVODSHIP

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Abstract. A very important factor in sustainable development, especially of small cities, is their endogenous capital, including human capital. Cities with a higher level and quality of human capital are able to gain advantage in productivity and competitiveness, and they can develop more rapidly owing to the “knowledge spillover”. Differences in the level of human capital between cities also affect the pace of development of an entire region and country. It is therefore important to analyze the scale of such differentiation, particularly among small cities, which are struggling with problems like urban shrinkage, talent drain or peripheralisation. The aim of the research was to assess the differentiation in the level of human capital among small cities in the warmińsko-mazurskie voivodship. The study covered 39 small cities. The Perkal synthetic indicator was applied to assess the level of human capital. Based on the values of this indicator, the cities were ordered linearly and grouped, using the standard deviations method. The level of human capital in the cities included in the study was significantly varied. The highest positions in the ranking were taken: Mikołajki, Lubawa, Biskupiec, Kisielice, Zalewo and Olsztynek. These cities were classified into the group of cities with high level of human capital. The lowest values of the human capital synthetic indicator were achieved for the cities: Sępólno, Jeziorany, Korsze, Pieniężno and Reszel. These cities were classified as cities with a very low level of human capital. The research results can help to design a strategy for the socio-economic development of the voivodship and to identify areas in need of strategic intervention.

Keywords: human capital; differentiation; small cities; development; synthetic indicator

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JEL Classifications: R11, O15, J24

1. Introduction

Human capital is seen in contemporary economy as a particularly valuable resource and a key factor that can ensure a lasting competitive advantage to countries, regions and companies (see Kuc-Czarnecka, 2019, pp. 425–440). Authors of numerous studies emphasise that the development of human capital is a distinguishing feature of successful cities and regions (see Romer, 1990, pp. 71–102; Cortright, 2001, pp. 1–35; Mellander & Florida, 2012, pp. 2–26; Kijek & Matras-Bolibok, 2019, pp. 695–709). Areas with a higher level of human capital gain an advantage in productivity, rate of development, and the growth in salaries and employment (see Shapiro, 2003, pp. 1–24; Fu, 2007, pp. 86–111). The sites where human capital concentrates (especially cities) develop more rapidly owing to the effect of knowledge spillover, facilitated by dense interaction between units possessing much human capital (see Lucas, 1988, pp. 3–42; Glaeser, 2003, pp. 83–98).

The use of endogenous development potential, including human capital, is especially important for small cities, which are an important element of the country's settlement network and constitute local poles of development (Szarek-Iwaniuk, 2019, p. 2; Farelnik et al., 2020, pp. 19, 24). By acting as local centres, they organise the space and affect the quality of living of both their residents and the population living in the surrounding countryside (Heffner, 2016, p. 11). However, small cities struggle with many economic, social and spatial problems. The contemporary challenges for small towns are the outflow of population, peripheralization, small economic potential, poor absorption of innovations and aggregation of negative social phenomena (Drobnik, 2019, p. 49; Farelnik et al., 2021, pp. 141–142). In this situation, the chances of a city for development increasingly often depend on the level and quality of gathered human capital as well as on the opportunities for its creation and development.

The level of human capital in Poland is differentiated regionally. The warmińsko-mazurskie voivodship is one of the Polish provinces with the lowest level of human capital (see Bizon, 2014, pp. 295–310; Nazarczuk & Cicha-Nazarczuk, 2014, pp. 189–200; Wierzbicka, 2017, pp. 329–343). Because of the low level of entrepreneurship in this region, there is a constant outflow of the highest quality human capital to regions which offer employment and higher enumerations. This process is particularly prevalent in the case of small cities.

The aim of the research was to assess the differentiation in the level of human capital among small cities in the warmińsko-mazurskie voivodship. An effort was made to find answers to two research problems: *What is the scale of this differentiation?* and *Which cities in the region have the lowest level of human capital?*

The study covered all small cities in the warmińsko-mazurskie voivodship. The level of human capital possessed by the cities was assessed on the basis of 12 variables describing the cities' potential in this regard. The analysis was carried out on data from 2019. The Perkal method was applied. It enabled to determine a synthetic indicator describing the level of human capital in cities and to order them linearly. The research also employed one of the methods of grouping linearly ordered objects, that is the standard deviation method.

The article is composed of the following parts: theoretical background, research methodology, results, discussion and conclusions. The theoretical background focuses on the definition of human capital and how it is measured. The role of human capital in the development of modern cities is also described. The methodology section discusses the statistical methods used in the study and the way the variables were selected. The subsequent part of the article discusses the research results concerning the differentiation in the human capital level among small cities in the warmińsko-mazurskie voivodship. In the next part, the author refers her results to studies reported by other researchers. The article ends with conclusions, including suggestions for future research.

2. Theoretical background

The importance of human capital in explaining the wealth of nations was emphasised by such economists as W. Petty, A. Smith and J.B. Say. However, the principles of the human capital theory were expressed later, in the 1960s, by J. Mincer, T.W. Shultz and G.S. Becker. At that time, human capital was mainly equated to formal education, especially schooling and the time dedicated to learning (see Mincer, 1958, pp. 281–302; Schultz, 1961, pp. 1–16; Becker, 1964, pp. 9–49). With time, the definition of human capital was extended to include the aspect of physical health (see Grossman, 1972, pp. 223–255; Mirvis, Chang & Cosby, 2008, pp. 30–57).

The notion of human capital appeared broadly in theories of economic growth. R. Lucas (1988, pp. 3–42) in the theory of endogenous growth demonstrated that accumulation of human capital and scientific and technical knowledge is a source of long-term economic growth. N.G. Mankiw, D. Romer and D.N. Weil (1992, pp. 407–437) considered the process of human capital accumulation in the Solow's neoclassical growth model, which facilitated its better adjustment to the actually observed growth tendencies in countries. These authors demonstrated that differentiation in the GDP per capita in different countries can be to a large extent explained by differences in the level of education. Studies on the influence of human capital on the economic growth of countries and regions have been continued to this day (see Barro, 1999, pp. 237–277; Bils & Klenow, 2000, pp. 1160–1183; Badinger & Tondl, 2003, pp. 215–239; Herbst, 2007, pp. 166–203; Gennaioli et al., 2013, pp. 105–164; Karambakuwa *et al.*, 2020, pp. 1143–1159). There are also discussions about the direction and strength of the relationship between these categories (see Boozer *et al.*, 2003, pp. 1–48; Spagat, 2006, pp. 44–56; Mehrara & Musai, 2013, pp. 55–62).

There are indications in the literature that the development of human capital is a key feature of successful cities. Human capital enhances productivity and creativity of individuals, improves the competitiveness on the labour market, gives a stimulus to new initiatives and unleashes the spirit of enterprise and technical progress (Starosta (Ed.), 2012, pp. 42–43). In cities with high concentration of human capital, an increase in the number of jobs and productivity of companies is higher than in other cities (see Fu, 2007, pp. 86–111; Elvery, 2010, pp. 367–379). The underlying reason is that people with superior skills are able to perform tasks more quickly and effectively, meaning that they can produce more and generate a higher added value (Florida et al., 2012, p. 355). Of significance is also the effect of knowledge spillover (Shapiro, 2003, p. 13). High quality human capital accelerates the process of knowledge and innovation creation and diffusion, which affects the rate of the economic growth in a given territory (Wierzbicka, 2017, p. 331).

The following are considered as the most important factors influencing the level and quality of human capital: quality of education, attractiveness of the local labour market, including its size and diversity, migrations of people, especially young ones with high qualifications, and a variety of properties composing the attractiveness of living in a given location (quality of living). All these factors are usually shaped during the long process of the development of a given area, during which the characteristics and economic functions have arisen, as well as demographic properties and social and cultural characteristics of the local population, including the culture of entrepreneurship (Gwosdz et al., 2019, p. 39).

Nowadays, there is no consensus on the definition of human capital. In its narrow sense, it is understood as the level of education in a given economy and is equated with these characteristics of persons that are related to formal education and skills (see Florczak, 2008, p. 171; Faggian & McCann, 2009, p. 319; Cabrita, 2015, p. 22; Bean, 2016, p. 104). In a broader view, it comprises knowledge resources, skills, competences, health and even the vital energy of a society. In other words, human capital includes not only the quantitatively seen formal education but also the quality and structure of education as well as all skills and competences earned by people outside the system of education and their health condition (see Bontis et al., 1999, p. 393; OECD, 2001, p. 18;

Kucharčíková, 2011, p. 65). Human capital is a complex and ambiguous notion, in addition to which it is intangible in nature, making it difficult to measure.

The literature most often distinguishes three methods for measuring human capital: the cost-, income- and education-based ones. The cost-based method involves determination of the outlays into the creation of human capital, that is the costs incurred by teaching and educating people. The income-based method means mainly the determination of the present value of future earnings by individuals, because it rests on the assumption that differences in earned salaries reflect the ultimate productivity of work. The education-based approach consists of identifying the level of education of the society. According to this method, education is the key element in the formation of human capital (see Oxley et al., 2008, pp. 283–344; Robinson et al., 2008, pp. 53–67; Roszkowska, 2012, pp. 38–44). The literature also provides many examples of studies in which these methods were employed (see Botev et al., 2019, pp. 3–54; Broxterman & Yezer, 2020, pp. 1–7). It is worth underlining, however, that the application of any of these methods commands the availability of many data, which in the case of regions or cities may be either inaccessible or difficult to access. Hence, evaluation of the level of human capital is often based on synthetic indicator, which are determined from the available partial indicators that are its approximations (Grześkowiak, 2017, p. 8). Among the indicators used most often are ones that identify the level of formal education, e.g. gross enrolment ratio, share of persons with a specific education level, average number of years in education, average results of examinations, etc. Other popular indicators are connected with occupational activity (e.g. employment rate, unemployment rate, entrepreneurship), mobility (e.g. migration balance, length of residing in the same location) and health (e.g. expenditure on health care, average longevity) (see *Guide...*, 2016, pp. 1–150; Gwosdz et al., 2019, pp. 27–34).

However human capital is defined, its role in the knowledge-based economy is growing steadily. Human capital is ‘a carrier’ of knowledge and innovation, which are pivotal to the ability of national, regional or local economies to compete successfully and to develop. Human capital is also perceived as a very important factor in the sustainable development of cities, regions, and countries.

3. Research methodology

The evaluation of the level of human capital and its differentiation was performed for all small cities in the warmińsko-mazurskie voivodship. According to the classification applied in Poland, small cities are the ones with population of up to 20,000 (compare Runge, 2012, pp. 83–101; Gaczek et al., 2019, pp. 7–10). In 2019, there were 39 such cities in the warmińsko-mazurskie voivodship.

The Perkal method was applied to analyse the differences in the human capital level owned by these cities. This approach enables to order analysed multi-dimensional objects according to a synthetic measure, which is a function of the input variables (Parysek & Wojtasiewicz, 1979, p. 26). The Perkal method is often used to assess the level of the socio-economic development of cities (see Kwiatek-Sołtys, 2011, pp. 363–370; Konecka-Szydłowska, 2012, pp. 135–146), regions (see Churski, 2014, pp. 63–77; Miśkiewicz-Nawrocka & Zeug-Żebro, 2017, pp. 69–83; Borkowski, 2020, pp. 195–216) and states (see Kruk & Waśniewska, 2017, pp. 337–352; Krasnodębski & Paluch, 2018, pp. 1722–1737). The choice of variables used to develop the Perkal’s synthetic indicator was based on formal, subject-related and statistical considerations.

At the stage of considering the subject-related and formal aspects, an effort was made to select such variables that would most faithfully describe the level of human capital in cities. However, the limited availability of data from small cities created a considerable challenge. Hence, the variables chosen, while being highly relevant for the subject matter, were universal, measurable, available and complete (compare Balcerzak & Pietrzak, 2017, pp. 5–18). In total, 16 potential variables were enrolled in the study.

At the next stage, which comprises the selection statistical data, the variation of the variables was taken into consideration, as well as the degree to which they correlate with the other variables. The variables for which the variability coefficient was below the adopted threshold value, i.e. 0.1, were discarded from the set of potential variables. Likewise, the variables for which the value of the Pearson correlation coefficient was higher than the adopted threshold value of 0.8 were removed from the set (compare Bal-Domańska et al., 2020, pp 790–795). In total, 4 variables were discarded. The final set of variables used to create the synthetic indicator of human capital contained 12 variables (both simulants – S and destimulans – D):

- X_1 – number of business entities per 1,000 working age population – S,
- X_2 – number of working persons per 1,000 population – S,
- X_3 – share of registered unemployed persons in the working age population – D,
- X_4 – share of non-working age persons in the total population – D,
- X_5 – permanent residence migration balance per 1,000 population – S,
- X_6 – birth rate per 1,000 population – S,
- X_7 – gross primary school enrolment rate – S,
- X_8 – number of students per 1 class in primary schools – D,
- X_9 – average primary school leaving exam results in mathematics – S,
- X_{10} – average primary school leaving exam results in English – S,
- X_{11} – average mid-secondary school exam results in mathematics – S,
- X_{12} – average mid-secondary school exam results in English – S.

The procedure of the determination of the synthetic human capital indicator was preceded by the process of data normalisation. The normalisation of variables was accomplished with the classical standardisation procedure, which ensures the elimination of variability as a basis for differentiating between objects (Walesiak, 2014, p. 368). Standardisation of variables was carried out as follows (Kruk & Waśniewska, 2017, p. 343):

$$\text{for the stimulants} \quad z_{ij} = \frac{x_{ij} - \bar{x}_j}{s(x_j)}, \quad i = 1, 2, \dots, n; j = 1, 2, \dots, m, \quad (1)$$

$$\text{for the destimulants} \quad z_{ij} = - \frac{x_{ij} - \bar{x}_j}{s(x_j)}, \quad i = 1, 2, \dots, n; j = 1, 2, \dots, m, \quad (2)$$

where:

z_{ij} – standardised value of j -th variable in i -th object,

x_{ij} – value of j -th variable in i -th object,

\bar{x}_j – arithmetic mean of the value of j -th variable

s_{x_j} – standard deviation of j -th variable.

Standardised variables were submitted to the procedure of synthetisation. The Perkal synthetic indicator for the analysed cities was derived from the formula (Kruk & Waśniewska, 2017, p. 344):

$$s_i = \frac{1}{m} \sum_{j=1}^m z_{ij} \quad i = 1, 2, \dots, n, \quad (3)$$

where:

s_i – value of the Perkal indicator in i -th object,

z_{ij} – standardised value of j -th variable in i -th object,

m – number of variables.

The Perkal synthetic indicator can take values within the range $[-3; 3]$. It served to order linearly the analysed cities and to group them according to the level of human capital they own.

The division of cities into groups was conducted with the help of the standard deviation method. The range limits were set based on the arithmetic mean value of the Perkal indicator for all cities (\bar{s}) and the level of the standard deviation of this indicator $S(s)$ (Panek & Zwierzchowski, 2013, pp. 118–119). The set of the cities was divided into four groups:

1. With a very high level of human capital – the Perkal indicator in the range of $s_i \geq \bar{s} + S(s)$;
2. With a high level of human capital – the Perkal indicator in the range $\bar{s} + S(s) > s_i \geq \bar{s}$;
3. With a low level of human capital – the Perkal indicator in the range $\bar{s} > s_i \geq \bar{s} - S(s)$;
4. With a very low level of human capital – the Perkal indicator in the range $s_i < \bar{s} - S(s)$.

Both the linear ordering and the grouping of the cities were carried out on the basis of data of 2019, acquired from the Local Data Bank.

4. Results

The cities turned out to be significantly diverse with regard to values of the tested variables describing the level of human capital. This is confirmed by such information as the minimum and maximum value of standardised variables (Table 1).

Table 1. Variables describing the level of human capital in cities – basic descriptive statistics

Variables describing the level of human capital in cities	Value of the variable after standardization		Range
	Minimum	Maximum	
X ₁ – number of business entities per 1,000 working age population (S)	-2.049 (Wielbark)	3.411 (Mikołajki)	5.459
X ₂ – number of working persons per 1,000 population (S)	-1.313 (Sępólno)	2.976 (Lubawa)	4.290
X ₃ – share of registered unemployed persons in the working age population (D)	-2.267 (Sępólno)	1.625 (Lubawa)	3.893
X ₄ – share of non-working age persons in the total population (D)	-1.831 (Reszel)	2.920 (Wielbark)	4.752
X ₅ – permanent residence migration balance per 1,000 population (S)	-2.234 (Jeziorany)	2.589 (Barczewo)	4.823
X ₆ – birth rate per 1,000 population (S)	-2.219 (Górowo Iławeckie)	1.635 (Biszynek)	3.854
X ₇ – gross primary school enrolment rate (S)	-1.504 (Wielbark)	3.987 (Kielce)	5.491
X ₈ – number of students per 1 class in primary schools (D)	-1.704 (Orzysz)	2.013 (Kielce)	3.717
X ₉ – average primary school leaving exam results in mathematics (S)	-1.901 (Pasym)	2.835 (Wielbark)	4.736
X ₁₀ – average primary school leaving exam results in English (S)	-1.929 (Ryn)	2.177 (Mikołajki)	4.107
X ₁₁ – average mid-secondary school exam results in mathematics (S)	-2.656 (Barczewo)	2.692 (Mikołajki)	5.347
X ₁₂ – average mid-secondary school exam results in English (S)	-1.753 (Gołdap)	3.164 (Ruciane Nida)	4.917

Source: own calculations based on data from Local Data Bank (2020)

In this case, the variables for which the range between the cities was the biggest were: gross primary school enrolment rate and number of business entities per 1,000 people in the working age population. The variable for which the range was the smaller turned out to be the average number of students per 1 class in primary schools. The maximum value of a variable was achieved by Mikołajki on three occasions, by Lubawa, Kisielice and Wielbark for two variables each, while Barczewo, Bisztynek, Ruciane-Nida scored the highest once. The minimum value of a variable was determined twice for Sępólno and Wielbark, and once for Barczewo, Gołdap, Górowo Iławeckie, Jeziorany, Orzysz, Pasym, Reszel and Ryn. The analysis suggests quite large area of variability of the analysed characteristics, describing the level of human capital in cities. Furthermore, the cities present internal variation in terms of their level of human capital. In some aspects, they score quite high and can be said to be leaders, whereas in some other areas their position is very weak (Wielbark is a good example of such internal discrepancies).

Differences in values of particular variables translated to the position of each city in a ranking list pertaining to the level of owned human capital (Table 2).

Table 2. Results of linear ordering of cities according to the level of human capital

Position in the ranking	City	Type of municipality ¹	Value of the Perkal synthetic indicator
1	Mikołajki	r-u	1.003
2	Lubawa	u	0.740
3	Biskupiec	r-u	0.634
4	Kisielice	r-u	0.576
5	Zalewo	r-u	0.519
6	Olsztynek	r-u	0.418
7	Olecko	r-u	0.407
8	Lidzbark Warmiński	u	0.369
9	Wielbark	r-u	0.369
10	Młynary	r-u	0.285
11	Pisz	r-u	0.215
12	Dobre Miasto	r-u	0.176
13	Braniewo	u	0.151
14	Węgorzewo	r-u	0.136
15	Nowe Miasto Lubawskie	u	0.123
16	Ryn	r-u	0.118
17	Susz	r-u	0.109
18	Gołdap	r-u	0.046
19	Miłakowo	r-u	0.030
20	Bisztynek	r-u	0.019
21	Nidzica	r-u	0.004
22	Morąg	r-u	-0.032
23	Ruciane-Nida	r-u	-0.046
24	Frombork	r-u	-0.123
25	Pasym	r-u	-0.165
26	Miłomłyn	r-u	-0.235
27	Orzysz	r-u	-0.235
28	Orneta	r-u	-0.236
29	Tolkmicko	r-u	-0.264
30	Biała Piska	r-u	-0.272

31	Pasłęk	r-u	-0.274
32	Górowo Iławeckie	u	-0.307
33	Lidzbark	r-u	-0.353
34	Barczewo	r-u	-0.389
35	Reszel	r-u	-0.521
36	Pieniężno	r-u	-0.663
37	Korsze	r-u	-0.753
38	Jeziorany	r-u	-0.780
39	Sępól	r-u	-0.800

¹ a city in a rural-urban municipality (r-u), an urban municipality (u)

Source: own calculations based on data from Local Data Bank (2020)

The top-scoring city was Mikołajki, a small town in the District of Mrągowo, with a population of 3,787. The Perkal synthetic indicator for this city was 1.003, which indicates a high level of human capital found in this city. The distinguishing asset of this city among all the 39 cities is the highest level of entrepreneurship. There are 252 business entities per 1,000 population in Mikołajki, in comparison to an average 158 businesses in all the analysed set of cities. Mikołajki is also distinguished by the highest average results achieved by primary school leavers in the English (64% versus 49% for the total set of cities) as well as the highest average result obtained from the mathematics exam taken by mid-secondary school pupils (52% versus 36% for the total number of the cities). The second position was scored by Lubawa, situated in the District of Iława. This is an urban municipality, with a population of 10,388. It was the highest number of working persons per 1,000 population (512 versus 219 for all cities) and the lowest percentage of registered unemployed persons in the working age population (2.4% versus 5.6% for all cities). The third position is occupied by Biskupiec, a city in the District of Olsztyn, populated by 10,634 people. An advantage of this city is one of the highest, and positive permanent residence migration balance per 1,000 residents (1.9 relative to the average for all cities being -4.1). Another upside is quite good results achieved by schoolchildren passing the middle secondary school examination in mathematics (44% versus 36% for all cities). Moreover, values of most variables describing the level of human capital were higher in this city than their average counterparts for all the cities. This observation is supported by the fact that values of as many as 10 variables, following standardisation, were positive.

Sępól was assessed as having the lowest level of human capital among the analysed set of cities. It is a very small town, with a population of 1,941, situation in the District of Bartoszyce. The weakness of this town lies in the lowest number of working persons per 1,000 population (90 versus the average for all cities equal 219) and the highest share of registered unemployed persons in the working age population (10.1% versus the 5.6% average). Sępól is also characterised by one of the poorest examination results achieved by mid-secondary school pupils in English (47% versus 61% for all cities). Another city with very low human capital is Jeziorany, located in the District of Olsztyn. Jeziorany has the highest negative balance of migration for permanent residence per 1,000 population (-13.5 versus the average for all cities equal -4.1) and one of the lowest birth rates per 1,000 population (-8.9 versus the average of -3.3). Significantly, the value of the Perkal synthetic indicator in as many as 21 cities was positive and higher than the average value for all the set. In 18 cities, this indicator obtained negative values. The range between the highest value of the Perkal indicator, which was scored by Mikołajki, and the lowest one, determined for Sępól, was 1.803.

The subsequent step in this analysis was grouping the cities. Consequently, four groups of cities were distinguished (Table 3).

Table 3. Results of grouping cities using the standard deviation method

Group	City	Level of human capital	Average value of the Perkal indicator in the group
1	Mikołajki, Lubawa, Biskupiec, Kisielice, Zalewo, Olsztynek	very high $s_i \geq 0.416$	0.648
2	Olecko, Lidzbark Warmiński, Wielbark, Młynary, Pisz, Dobrze Miasto, Braniewo, Węgorzewo, Nowe Miasto Lubawskie, Ryn, Susz, Gołdap, Miłakowo, Bisztynek, Nidzica	high $0.416 > s_i \geq 0.0$	0.171
3	Morąg, Ruciane-Nida, Frombork, Pasym, Miłomłyn, Orzysz, Orneta, Tolkmicko, Biała Piska, Pasłęk, Górowo Iławeckie, Lidzbark, Barczewo	low $0.0 > s_i \geq -0.416$	-0.225
4	Reszel, Pieniężno, Korsze, Jeziorany, Sępól	very low $s_i < -0.416$	-0.704

Source: own calculations based on data from table 2

The first one, with a very high level of human capital, contains 6 cities: Mikołajki, Lubawa, Biskupiec, Kisielice, Zalewo and Olsztynek. The average value of the Perkal indicator for this group was 0.648, at the standard deviation of 0.204. The second group included 15 cities with high human capital. The average value of the Perkal indicator here was 0.171, and the standard deviation was 0.133. Thus, this was a far more numerous group, but less diverse than the first one. The third group, with a low level of human capital, consisted of 13 cities. The average value of the Perkal indicator was -0.225, at standard deviation of 0.108. This group turned out to be even less diverse than the second one. The fourth group, composed of cities with the lowest level of human capital, gathered 5 cities: Reszel, Pieniężno, Korsze, Jeziorany and Sępól. The average value of the Perkal indicator was -0.704, and the five cities diverged from this value by an average of 0.115. In brief, the group of cities with the highest level of human capital proved to be the most diverse one.

5. Discussion

The literature provides many examples of studies which focus on analysing the level of human capital in Poland (see Bryl, 2020, pp. 33–66; Siemiński et al., 2020, pp. 300–311), Polish regions (see Bizon, 2014, pp. 295–310; Klonowska-Matynia, 2019, pp. 32–51;), districts (see Wosiek, 2020, pp. 183–201) or cities (see Benneworth & Herbst, 2015, pp. 452–474; Wiktorowicz, 2016, pp. 85–99). Such analyses concern both the level of owned human capital and changes thereof. Many studies also deal with the influence of human capital on the economic growth of analysed regions or cities (see Herbst, 2007, pp. 166–203; Roszkowska, 2013, pp. 121–161). However, there are relatively few studies on the level of human capital in small cities, and those which are available pertain to just some of the Polish voivodships (see Konecka-Szydłowska & Dominiak, 2013, pp. 41–60). Moreover, they are often part of larger research and do not comprise all the aspects of this research problem. For example, an analysis of the level of human capital in small cities in the warmińsko-mazurskie voivodship has been made under the framework of an assessment of the socio-economic potential of the region, but it was based on just two parameters (see *Analysis of functional...*, 2019, pp. 30–34). A more complex analysis of the regional differentiation in the level of human capital in this voivodship was made for the districts (see Bartnik, 2015, pp. 7–23). The present study therefore fills in the gap in knowledge by analysing human capital in small cities.

The author is aware that due to the limited amount of data available she was unable to take into consideration all aspects of human capital.

Interestingly, the research results obtained here are consistent with the results provided by the aforementioned, more general studies. The report in the socio-economic potential of cities in the region of Warmia and Mazury suggests that the lowest level of human capital, measured for example with results of the exams taken in the middle of secondary education, was determined in the smallest, peripheral cities (e.g. Sępólno, Pieniężno, Pasłęk, Tolkmicko, Barczewo, Biała Piska, Gołdap). This has been verified in the study presented herein. Furthermore, some consistency was also noticed between the current results and the ones obtained from a study of districts. For instance, the cities which were classified in this study as having a very high level of human capital are situated in the districts identified as possessing the highest human capital in the region (the districts of Olsztyn, Mrągowo, Iława). In turn, the cities determined to have a very low level of human capital were located in the districts characterized by the lowest level of human capital in the entire voivodship (the districts of Bartoszyce and Kętrzyn). Jeziorany was an exception. In the present study, this city occupied the second lowest position in terms of human capital, although it is situated in the District of Olsztyn, which is distinguished by a very high level of human capital. This might be explained by so-called human capital flight, that is the outflow of this city's resources to places where job opportunities are more appealing. However, the author did not analyse this issue.

6. Conclusions

The above study and its results indicate that the level of human capital in small cities located in the warmińsko-mazurskie voivodship is significantly varied. This is confirmed by a considerable range achieved by the computed Perkal synthetic indicator, which varied within $<-0.800; 1.003>$. The highest level of human capital was identified in Mikołajki, a small town in the District of Mrągowo. The lowest level of human capital was determined in Sępólno, one of the smallest towns in the voivodship, located in the District of Bartoszyce.

The differences between the cities in terms of their human capital are also confirmed by the results of the grouping of cities. The group of cities with very high human capital resources contained 6 out of 39 small cities analysed. The six cities differ in size, but most are situated in the north-western part of the voivodship. The group of cities with very low human capital consisted of 5 cities. They are the cities with the population of up to 5 thousand, mostly located in the northern part of the voivodship.

Recapitulating, the small cities in the warmińsko-mazurskie voivodship are characterised by the diverse level of human capital, and therefore they have different opportunities for development, based on the said capital. Significantly, their position in the economic structure of the voivodship largely depends the efficient management of knowledge on the regional level, and on the development and implementation of a proper strategy for development. Such strategy, based on the creation and use of human capital, would accelerate the process of diffusion of knowledge and innovation, and would enable a given city to attract and retain talents in its limits.

The results of the study reported above can serve as a valuable source of information and can be useful in designing strategies for the socio-economic development of the voivodship, and in identifying areas in need for strategic intervention. The planned continuation of this study will consist of an analysis of changes in levels of human capital in the same cities that have occurred in recent years. An attempt will also be made to determine whether there are any convergence or divergence processes taking place between these cities. Another key problem will be to explore and understand the causes underlying the above changes, and to identify major problem areas.

References

- Analysis of functional and spatial relations between urban centers and their surroundings.* (2019). Report for warmińsko-mazurskie voivodeship prepared by the Polish Academy of Sciences and the Jagiellonian University in Krakow.
- Badinger, H., & Tondl, G. (2003). Trade, human capital and innovation: the engines of European regional growth in the 1990s. In B. Fingleton (Eds.). *European regional growth. Advances in spatial science*. Berlin, Heidelberg: Springer. http://dx.doi.org/10.1007/978-3-662-07136-6_8
- Bal-Domańska, B., Sobczak, E., & Stańczyk, E. (2020). A multivariate approach to the identification of initial smart specialisations of Polish voivodeships. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 15(4), 785-810. <http://dx.doi.org/10.24136/eq.2020.034>
- Balcerzak, A. P., & Pietrzak, M. B. (2017). Digital economy in Visegrad countries. Multiple-criteria decision analysis at regional level in the years 2012 and 2015. *Journal of Competitiveness*, 9(2), 5-18. <http://dx.doi.org/10.7441/joc.2017.02.01>
- Barro, R.J. (1999). Human capital and growth in cross-country regressions. *Swedish Economic Policy Review*, 6(2), 237-277.
- Bartnik, K.M. (2015). Differentiation of human capital resources in Warmia and Mazury region. *Society and Economics*, 2(4), 7-23. <http://dx.doi.org/10.15611/sie.2015.2.01>
- Bean, C. (2016). *Independent review of UK economic statistics*. Retrieved March 22, 2021, from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507081/2904936_Bean_Review_Web_Accessible.pdf
- Becker, G.S. (1962). Investment in human capital: a theoretical analysis. *Journal of Political Economy*, 70(5/2), 9-49. <http://dx.doi.org/10.1086/258724>
- Bils, M., & Klenow, P.J. (2000). Does schooling cause growth? *American Economic Review*, 90(5), 1160-1183. <http://dx.doi.org/10.1257/aer.90.5.1160>
- Bizon, W. (2014). A diversity of human capital in Poland. *Studies and Works of the Faculty of Economics and Management*, 35(2), 295-310.
- Bontis, N., Dragonetti, N. C., Jacobsen, K., & Roos, G. (1999). The knowledge toolbox: a review of tools available to measure and manage intangible resources. *European Management Journal*, 17(4), 391-402. [http://dx.doi.org/10.1016/S0263-2373\(99\)00019-5](http://dx.doi.org/10.1016/S0263-2373(99)00019-5)
- Boozer, M., Ranis, G., Stewart, G., & Suri, T. (2003). Paths to success: the relationship between human development and economic growth. *Center Discussion Paper*, 874, 1-48.
- Borkowski, M. (2020). Economic security of Polish voivodeships. Measuring the concepts. *Studies in Law and Economics*, 114, 195-216. <http://dx.doi.org/10.26485/SPE/2020/114/11>
- Botev, J., Égert, B., Smidova, Z., & Turner, D. (2019). *A new macroeconomic measure of human capital with strong empirical links to productivity*. OECD Economics Department Working Papers No. 1575. <http://dx.doi.org/10.1787/d12d7305-en>
- Broxterman, D., & Yezer, A. (2020). Measuring human capital divergence in a growing economy. *Journal of Urban Economics*, 118(103255), 1-7. <http://dx.doi.org/10.1016/j.jue.2020.103255>
- Bryl, L. (2020). Long-term development of national human capital. Evidence from China and Poland. *Journal of Intercultural Management*, 12(2), 30-66. <http://dx.doi.org/10.2478/joim-2020-0044>
- Cabrita, M. R., Cabrita, C., Matos, F., & Pilar Muñoz Dueñas, M. (2015). Entrepreneurship capital and regional development: a perspective based on intellectual capital. In R. Baptista, & J. Leitão. (Eds.). *Entrepreneurship capital and regional Development*. Switzerland: Springer. <http://dx.doi.org/10.1007/978-3-319-12871-9>
- Churski, P. (2014). Variations in the spatial distribution of areas of economic growth and stagnation in Poland: Determinants and consequences. *Quaestiones Geographicae*, 33(2), 63-77. <http://dx.doi.org/10.2478/quageo-2014-0016>

- Cortright, J. (2001). New growth theory, technology and learning: a practitioner's guide. *Reviews of Economic Development Literature and Practice*, 4, 1-35.
- Drobniak, A. (2019). Resilience and hybridization of development of small and medium towns in Poland. *Olsztyn Economic Journal*, 14(1), 47-62 <http://dx.doi.org/10.31648/oiej.3644>
- Elvery, J.A. (2010). City size and skill intensity. *Regional Science and Urban Economics*, 40(6), 367-379. <http://dx.doi.org/10.1016/j.regsciurbeco.2010.05.006>
- Faggian, A., & McCann, P. (2009). Human capital, graduate migration and innovation in British regions. *Cambridge Journal of Economics*, 33(2), 317-333. <http://dx.doi.org/10.1093/cje/ben042>
- Farelnik, E., Stanowicka, A., & Wierzbicka, W. (2020). *Cittaslow – model rozwoju i współpracy małych miast (Cittaslow – a model of development and cooperation between small cities)*. Olsztyn: University of Warmia and Mazury in Olsztyn.
- Farelnik, E., Stanowicka, A., & Wierzbicka, W. (2021). The effects of membership in the Polish National Cittaslow Network. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(1), 139-167. <http://dx.doi.org/10.24136/eq.2021.005>
- Florczak, W. (2008). Human capital in empirics of growth modeling. *Economist*, 2, 169-200.
- Florida, R., Mellander, C., Stolarick, K., & Ross, A. (2012). Cities, skills and wages. *Journal of Economic Geography*, 12(2), 355-377. <http://dx.doi.org/10.1093/jeg/lbr017>
- Fu, S. (2007). Smart café cities: testing human capital externalities in the Boston metropolitan area. *Journal of Urban Economics*, 61, 86-111. <http://dx.doi.org/10.1016/j.jue.2006.06.002>
- Gaczek, W. M., Bernaciak, A., Kisiała, W., Mrozińska, A., & Palicki S. (2019). *Medium towns in the Wielkopolskie voivodship and their significance for the region's development*. Retrieved March 18, 2021, from https://wrot.umww.pl/wp-content/uploads/2020/01/miasta_srednie_w_Wlkp.pdf
- Gennaioli, N., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2013). Human capital and regional development. *The Quarterly Journal of Economics*, 128(1), 105-164. <http://dx.doi.org/10.1093/qje/qjs050>
- Glaeser, E. (2003). The new economics of urban and regional growth. In G. Clark, M. Feldman, & M. Gertler (Eds.). *The Oxford handbook of economic geography*. Oxford: Oxford University Press.
- Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy*, 80(2), 223-255.
- Grześkowiak, A. (2017). Selected characteristics of the human capital in the biggest cities in Poland in comparison with other areas. *Society and Economics*, 1(7), 7-21. <http://dx.doi.org/10.15611/sie.2017.1.01>
- Guide on measuring human capital*. (2016). Geneva, Switzerland: United Nations.
- Heffner, K. (2016). Small towns and rural areas. Do local centers are needed by contemporary countryside? *Studies in Economics. Research Papers*, 279, 11-24.
- Herbst, M. (2007). The effect of human and social capital on (short-term) economic growth in Polish subregions. In M. Herbst (Ed.). *Human capital and social capital and regional development*. Warsaw: Scholar.
- Gwosdz, K., Domański, B., Działek, J., Gałka, J., Guzik, R., Kocaj, A., Kołoś, A., Puchalski, Ł., Świgost, A., & Woźniak-Vecchie, R. (2019). *Human capital in metropolises. The current state of research and current research trends*. Krakow: Marshal's Office of the Małopolskie Voivodeship.
- Karambakuwa, R. T., Ncwadi, R. & Phiri, A. (2020). The human capital–economic growth nexus in SSA countries: what can strengthen the relationship? *International Journal of Social Economics*, 47(9), 1143-1159. <http://dx.doi.org/10.1108/IJSE-08-2019-0515>
- Kijek, T., & Matras-Bolibok, A. (2019). The relationship between TFP and innovation performance: evidence from EU regions. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(4), 695-709. <http://dx.doi.org/10.24136/eq.2019.032>

- Klonowska-Matynia, M. (2019). Health aspects of human capital differentiation in Poland. The regional approach. *The Polish Statistician*, 64(1), 32-51. <http://dx.doi.org/10.5604/01.3001.0013.8538>
- Konecka-Szydłowska, B. (2012). Differences among small towns of Wielkopolska voivodeship in terms of socio-economic development. *City Studies*, 8, 135-146.
- Konecka-Szydłowska, B., & Dominiak, J. (2013). Differences in human and social capital in small towns in Wielkopolska. In W. Gulczyński (Ed.). *Local and regional problems of spatial management*. Gorzów Wielkopolski: WSB.
- Krasnodebski, A., & Paluch, Ł. (2018). Multidimensional comparative analysis of the level of sustainable development of the European Union member states using taxonomic methods. *Proceedings of the International Scientific Days 2018*. Prague: Wolters Kluwer. <http://dx.doi.org/10.15414/isd2018.s8.09>
- Kruk, H., & Waśniewska, A. (2017). Application of the Perkal method for assessing competitiveness of the countries of Central and Eastern Europe. *Oeconomia Copernicana*, 8(3), 337-352. <http://dx.doi.org/10.24136/oc.v8i3.21>
- Kuc-Czarnecka, M. (2019). Sensitivity analysis as a tool to optimise Human Development Index. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(3), 425-440. <http://dx.doi.org/10.24136/eq.2019.020>
- Kucharčíková, A. (2011). Human capital – definitions and approaches. *Human Resources Management & Ergonomics*, 5(2), 60-70.
- Kwiatk-Sołtys, A. (2011). Small towns in Poland – barriers and factors of growth. *Procedia Social and Behavioral Sciences*, 19, 363-370.
- Local Data Bank. Statistic Poland. (2020). Retrieved December 20, 2020, from <https://bdl.stat.gov.pl/BDL/dane/podgrup/temat>
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.
- Mankiw, N.G., Romer, D., & Weil, D.N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, 107, 407-437.
- Mehrara, M., & Musai, M. (2013). The relationship between economic growth and human capital in developing countries. *International Letters of Social and Humanistic Sciences*, 5, 55-62. <http://dx.doi.org/10.18052/www.scipress.com/ILSHS.5.55>
- Mellander, C., & Florida, R. (2012). The rise of skills: Human capital, the creative class and regional development. *CESIS Electronic Paper Series*, 266, 2-26.
- Mincer, J. (1958). Investment in human capital and personal income distribution. *The Journal of Political Economy*, 66(4), 281-302.
- Mirvis, D. M., Chang, C. F., & Cosby, A. (2008). Health as an economic engine: evidence for the importance of health in economic development. *Journal of Health and Human Services Administration*, 31(1), 30-57.
- Miśkiewicz-Nawrocka, M., & Zeug-Żebro, K. (2017). The study of diversity of the demographic situation in Poland in the years 2005-2014. *Studies in Economics. Research Paper of University of Economics in Katowice*, 318, 69-83.
- Nazarczuk, J. M., & Cicha-Nazarczuk, M. (2014). Regional diversification of human capital in Poland. *Economic Problems of Services*, 114, 189-200.
- OECD. (2001). *The well-being of nations. The role of human and social capital*. Paris: OECD Publishing.
- Oxley, L., Le, T., & Gibson, J. (2008). Measuring human capital: Alternative methods and international evidence. *The Korean Economic Review*, 24(2), 283-344.
- Panek, T., & Zwierzchowski, J. (2013). *Statistical methods of multivariate comparative analysis. Theory and applications*. Warsaw: Warsaw School of Economics.
- Parysek, J. J., & Wojtasiewicz, L. (1979). *Methods of regional analysis and methods of regional planning*. Studies KPZK PAN. Warsaw: PWN.
- Robinson, D., Hooker, H., & Mercer, M. (2008). *Human capital measurement: approaches, issues and case studies*. Brighton: Institute for employment studies.

- Romer, P. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5), 71-102. <http://dx.doi.org/10.1086/261725>
- Roszkowska, S. (2013). *Human capital and economic growth in Poland*. Lodz: Publishing House of the University of Lodz.
- Runge, A. (2012). Methodological problems associated with research on midsize towns in Poland. *Geographical Works*, 129, 83-101. <http://dx.doi.org/10.4467/20833113PG.12.015.0523>
- Schultz, T. W. (1961). Investment in human capital. *The American Economic Review*, 51(1), 1-17.
- Shapiro, J. (2003). *Smart cities: explaining the relationship between city growth and human capital*. Cambridge: Harvard University.
- Siemiński, P., Hadyński, J., & Poczta, W. (2020). Diversification of human capital resources in rural and urban areas in Poland. *Annals of the Polish Association of Agricultural and Agribusiness Economists*, 22(1), 300-311. <http://dx.doi.org/10.5604/01.3001.0013.7908>
- Spagat, M. (2006). Human capital and the future of transition economies. *Journal of Comparative Economics*, 34(1), 44-56. <http://dx.doi.org/10.1016/j.jce.2005.11.002>
- Starosta, P. (Ed.). (2012). *Diversification of human and social capital resources in the Lodz region*. Lodz: Publishing House of the University of Lodz.
- Walesiak, M. (2014). Data normalization in multivariate data analysis. An overview and properties. *Statistical Overview*, 51(4), 365-372.
- Wierzbicka, W. (2017). Human capital as a pillar of knowledge-based economy – an analysis of the regional diversity in Poland. *Studies in Law and Economics*, 104, 329-343. <http://dx.doi.org/10.26485/SPE/2017/104/19>
- Wiktorowicz, J. (2016). Human capital of the residents of urban area's – generational approach. *City Studies*, 21, 85-99.
- Wosiek, M. (2020). Rural–urban divide in human capital in Poland after 1988. *Oeconomia Copernicana*, 11(1), 183-201. <http://dx.doi.org/10.24136/oc.2020.008>

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CRISIS DIAGNOSIS IN CROSS-BORDER REGIONS: LESSONS FROM THE PANDEMIC

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Abstract. In the article, methods and tools for diagnosing crisis phenomena in the conditions of the COVID-19 pandemic, based on the example of border regions of the Baltic Sea countries and the Northwestern Federal District of the Russian Federation, were presented. Governmental measures and restrictions on the functioning of the economic subjects introduced in the border regions caused some shock and stress situation, which are of great importance for the course of the crisis conditions and the way out of the crisis. The purpose of the diagnosis is to establish a specific recognition of the research object, to provide a specific description and to formulate a final document or a conclusion about the condition of this object within a specified research completion date. In other words, the diagnosis allows the determination of the state of the research object and the development of a conclusion from these results, which can be based on indicators, coefficients, standards, in order to propose real positive changes up to the definition of the strategy and development tactics. The study uses the methods of systemic, structural, factor and comparative analysis, considering common and available parameters. A qualitative diagnosis of the object is carried out based on the algorithm and research stages. Specific problems are investigated on the basis of indicators and characteristics that are comparable in studies of corona crisis phenomena. Currently, the frontier economy is facing new challenges that test the basic mechanisms of functioning in crisis conditions. All these processes imply measures to eliminate the consequences of post-pandemic phenomena. This research can be used by the public administration units in diagnosing the processes of cross-border cooperation in the period of recovering from the post-pandemic crisis.

Keywords: cross-border cooperation; cross-border region; border region; COVID-19 pandemic; diagnosis; diagnostic algorithm; crisis modeling

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1. Introduction

It should be noted that to date the situation is exacerbated by exceptional uncertainty about the measures taken by public administration bodies in the border regions. This is primarily the lack of diagnostics and measures for the introduction of quarantine in certain sectors, forced constraints on the economic and commercial activity of the population, restrictions on the access of the entire population to recreation and entertainment sectors, the transition to distance learning in schools and universities and the closure of children's and pre-school institutions. At present, the scale and nature of the impact of all these artificial restrictions in various industries and sectors of the economy is unclear. All this increases the complexity of diagnostics in the current crisis conditions. In the scientific literature the problems of diagnosis of corona crisis phenomena have not yet been studied, so the realization of the purpose and relevance of this study is of great importance. The research material is based on the example of the Baltic Sea countries and, to a greater extent, the border regions of the Northwestern Federal District (NWFD) of the Russian Federation. Russia is also a Baltic Sea country, but the scale and difference in the comparison of research would not be correct. Therefore, only one out of eight federal districts of Russia has been chosen, which borders with the countries of the European Union and has a direct relation to the Baltic Sea. It seems that this choice is correct and fully contributes to the realization of the research goal. In recent years, diagnostics as a research category has been boldly used in the assessment of cross-border cooperation. It plays the role of the most important scientific method and tool that enables answering many crisis problems in practically all researches.

The literature review section is built on a wide selection of COVID-19 related materials. The unfolding economic crisis has shown that many scholars are trying to make sense of the economic consequences of the corona crisis. For example, Ludvigson *et al.* (2020) found that the corona crisis is a major multi-period exogenous shock. Baker *et al.* (2020) note that COVID-19 led to a massive spike in uncertainty and no close studies exist in science. The authors found that a corona crisis shock results in an 11% annualized decrease in GDP. In another very important study (König & Winkler 2020), which was conducted on a sample of 42 countries (mostly European), it has been studied how coronavirus mortality rates affect GDP growth. Researchers note that the stringency of enforcement measures is an important factor in growth. For example, stricter measures lead to lower GDP in the quarter studied, but are associated with a positive catch-up growth effect in the next quarter. The impact of the corona crisis has enormous implications for the labor market. For example, Adams-Prassl *et al.* (2020), Beland *et al.* (2020) found that forced business closures lead to sharp unemployment and will have severe economic consequences in the long run.

In addition, many sources (Will 2020; Knight 2017; Zizka 2020) express dismay and bewilderment as to why political elites have been largely unprepared for this crisis. Scholars write of the deliberate ignorance and low qualifications of decision makers. Late response, complete confusion in the supply of medical drugs and the provision of ICU beds led to unfortunate consequences. Van Dam and Webbink (2020, p. 13) note that “everyone can define the problem and its cause in one's own way to derive one's favourite solution to the problem. Whatever measure is implemented to counter the crisis can be labelled anything from overreacting and creating panic to ignoring the seriousness and wilful negligence”. In the section related to research methodology and to some aspects of corona crisis diagnostics in the Baltic Sea countries, examples of qualitative diagnostics of corona crisis phenomena and corresponding forms, methods and means, which allow to receive certain guarantees against probable errors and calculations in concrete anti-crisis situations, are shown. On the basis of the algorithm and the corresponding toolkit, specific measures to support business entities and the population, which have been artificially limited in their activities, resulting in huge losses or job losses, are proposed. In the results section, specific examples of the corona crisis in the Baltic Sea countries and in the NWFD regions are discussed. The conclusions contain specific recommendations, as well as lessons learned from the pandemic that must be considered in real and practical life and in the prevention of such diseases in the future.

2. Literature review

The COVID-19 pandemic has caused an unprecedented economic crisis and has had extremely negative effects on economic activity, GDP growth, and unemployment (König & Winkler 2020). In addition, studies on the Baltic Sea countries confirm this conclusion (Ehle 2020). The author conducted an interesting study on German regions (401 counties were studied), which shows that there are inter-regional differences in the level of socioeconomic, demographic and health variables affecting the economy in a corona crisis. Using the example of another Baltic Sea country, Denmark (Marinov 2020), a number of important issues related to the specific socio-economic characteristics of the country, which affected the Danish economy in a pandemic, are examined. Particular attention is paid to the measures taken by the government in the labor market, household consumption, and entrepreneurial activity. Hensvik *et al.* (2020) in their paper show the changes caused by COVID-19 in the Swedish labor market. The authors give the example of a 40% decrease in vacancies during the first three months after the COVID-19 outbreak. The resulting tightness in the labor market redistributed job searches towards less affected occupations regardless of changes in job vacancies.

The unfolding economic corona crisis has classic and new unique features. Declines in production and international trade, financial shocks and tensions in economic activities are classic features of any crisis. New problems are primarily related to the denial of movement of people at all levels and their isolation at different scales (country, city, community). Therefore, a significant part of production is practically paralyzed and the decline in economic activity dependent on measures of isolation reaches impressive proportions (up to 30-40%). The duration of the isolation period is still unknown and there is no clear certainty about the mode of operation, removal of quarantine measures, contacts of the population and their movement. The pandemic struck practically the entire world economy and all countries were forced to implement quite severe restrictions, which in turn led to a sharp decline in production and exchange (Opłowska 2020; Hauser *et al.* 2020; Van Dam & Webbink 2020).

It can be seen as alarming that there is virtually no clear diagnosis on the problems of recovery from these crisis situations. As of today, it is only known that the pace of the economic recovery will depend on the severity and duration of quarantine measures, the restoration of border relations with neighboring regions, the restoration of trade relations, and the level of support for business by public administration bodies at all levels. Many governments have already announced plans to support economic actors at sectoral and industry levels, including support for small and medium-sized enterprises (Zemtsov *et al.* 2020; Knickel *et al.* 2021). It is expected that systemic understanding and assessment, and preferably diagnostics, will allow a rational approach to the threats and barriers posed by a pandemic. Quantitative risk assessment and tools have been based on the diagnosis of emerging crises for over 50 years.

However, there are also criteria that can help all businesses specifically. They concern, first of all, how business will behave under the current crisis conditions. Charles Darwin wrote: "It is not the strongest or the cleverest who survive, but the one who adapts best to change". It seems that in the conditions of the pandemic, it is not those who argue about lost opportunities who will survive, but those who understand that it is no longer possible to live the old way. New conditions have emerged, new requirements that demand every entrepreneur to be very active and make incredible efforts to develop in the new environment.

The study is built on an in-depth diagnosis of the causes that emerged during the expansion of the COVID-19 pandemic (Breznau 2021; Claeson & Hanson 2021; Shet *et al.* 2020; Kucharski *et al.* 2020). For example, early findings on the development of the pandemic have already provided guidance on the scale and direction in which to focus crisis response and increase support for businesses and populations.

It should be emphasized that the diagnosis of crisis phenomena in cross-border systems has its basic parameters and forms. Any parameters represent a system of criteria that reveal the specifics of a particular object. If we

consider pandemic crisis phenomena in border regions, then it will be a system of indicators of qualitative characteristics and indicators of crisis research, taking into account the relevant factors influencing it in a particular period of time. In order to qualitatively investigate the crisis phenomenon in border regions, a system of criteria and indicators is required, i.e. a system of indicators is selected to assess the state of crisis objects and the development on this basis of qualitative and quantitative indicators (scales) to measure the corresponding values. Since the border region is a peripheral territory of the state and, as a rule, is a depressed territory, the relevant indicators, coefficients and scales are developed by science qualitatively enough, and they will be presented (Zgonnik 2015).

However, it should be properly understood that the diagnosis of such processes should provide for the classification of emerging deviations, as well as the most important parameters of the studied pandemic crisis phenomena and their manifestations. In this case, the procedure of information collection and processing will be generally accepted. If we consider the specifics of development of border regions under pandemic conditions, it is desirable to highlight the comparison of the object under study and especially its state comparable to the norm or benchmark (with developed regions of the country) for diagnostic studies. This will make it possible to identify the presence of deviations and determine their nature regardless of whether it will be positive or negative (Balashov 2004; Korotkov 2020; Belyaev 2015; Larionov *et al.* 2019).

3. Research methodology and some aspects of diagnosis of corona crisis in the Baltic Sea countries

A qualitative diagnostic result is the first condition for the successful development and functioning of the economy of border regions in the post-pandemic time and the possibility to prevent a crisis situation in all spheres of the border economy. Of course, the minimization of negative consequences of crisis phenomena in post-pandemic time is central to the activities of governing bodies. However, in the border conditions of the regions of the Baltic Sea countries and NWFD regions of the Russian Federation, it is shown in the empirical part of the study, there is its own specificity and features when unforeseen circumstances arise, and all kinds of business activities are associated with relevant changes. In minimizing these problems diagnostic studies help to develop appropriate forms, methods and means, which allow to obtain certain guarantees against probable errors and miscalculations in anti-crisis situations.

For example, the problems encountered during the pandemic in the coastal regions of the NWFD show considerable variation in the level of socio-economic shock and stress. Diagnostics in NWFD regions is closely connected with controlling, where problems are formulated, and analysis begins, the purpose of which is to identify the real discrepancies, reduction or increase of deformation, actual and optimal state of the most important corona crisis situations. Key parameters of the corona crisis situation are defined, then specific problems are highlighted, there may be five to ten or more of them. Then we determine the sequence of operations: problem analysis, identification of the primary problem, analysis of the primary problem, diagnosis of the primary problem, and a diagnosis is established. On the basis of this diagnosis, forecasting and decision-making to eliminate contradictions is developed. It is very important that this process proceeds on the basis of specific indicators. In a pandemic, there are unifying indicators and characteristics that are comparable in corona crisis situations and allow the following lessons to be identified:

The first lesson is the general level of development of the border region. At the time of the study, the region is experiencing a deep economic crisis. There is a low rate of production. It has been in a phase of restriction and quarantine for a long time, a radical restructuring and, in some cases, diversification of production is required.

The second lesson is to assess the condition of industries and sectors that have been forcibly closed or artificially restricted since the beginning of the pandemic. The losses incurred and the support needed, including the

compensation of financial losses, are to be determined. In the Baltic Sea countries, the most affected sectors are tourism, hotels, gastronomy, airports, passenger seaports, etc.

The third lesson is the state of the social sphere. There is a decrease in income and living standards, unemployment, the levels of social services and the level of educational services are decreasing due to restrictive measures and the artificial closure of certain industries. The analysis shows that some countries of the Baltic Sea suffered from the corona crisis more than other European countries. First of all, there was a belated reaction to the growth of coronavirus infections (Poland), or complete neglect of restrictive measures at the beginning of the pandemic in Sweden.

The fourth lesson is investment activity. In a pandemic, the border region has no investment appeal, there is a high risk for entrepreneurial activity, and there is little development of new activities in post-pandemic times.

The fifth lesson is closely related to health care. Determination of the general level of health care facilities, provision with modern equipment, apparatus and medicines. Introduce mandatory coefficients of sufficient provision of the population with services of inpatient medical institutions. Allocate additional budgetary places for medical students, especially in specialties that are directly related to infectious diseases. Provide budget funding for the construction of new inpatient medical facilities for viral diseases.

The sixth lesson is the labor market and employment. Indicators of falling demand for labor, due to the temporary closure or bankruptcy of businesses. Measures to restore and create new jobs, training and retraining, support and preferences for enterprises that create new production and activities, and therefore new jobs. Cardinal measures to revitalize micro, small and medium-sized enterprises and create incentives to hire new workers.

The seventh lesson is personal income. Declining wages, low real income per capita. The high level of unemployment. Obligatory conditions for a way out of the crisis not to forget behind difficult and difficult decisions, to really support incomes of the population and curb inflation. We are talking first and foremost about the poorest segments of the population, who must already today be really helped to overcome the subsistence level and get a foothold in the new conditions. Substantial measures should be developed to support people who have lost their jobs during the pandemic and help them find work.

It should be considered that the diagnosis of the above-mentioned lessons and characteristics on both sides of the border may differ significantly, but by the trends and nature of deviations it is possible to establish forecasts for the joint elimination of crisis phenomena in the respective spheres.

Linear programming is particularly valuable in diagnosing corona crisis in the Baltic Sea countries and NWFD regions. It is a mathematical technique that allows us to find the best combination of resources and actions necessary to achieve the optimal result. The linear technique allows to optimize any process, to calculate the increase of new jobs, the growth of unemployment and the growth of profits, to calculate the efficiency of the use of potential, resources and time to overcome the corona crisis. In linear programming quantifies the goal, the parameters that will be subjected to this mathematical technique and the available benchmarks and constraints in the use of resources, capacities on a time-specific basis. Modeling of the assessment of the use of the potential of the regional-economic space in the Baltic Sea countries and NWFD regions is proposed in the post-crisis time in four stages.

At the first stage, a dynamic criterion is formed, in which the criterion order of indicators is selected. This order is a rank series, in which the indicators included in the list are ordered according to the criterion adopted. These are

indicators that characterize basic and auxiliary economic processes, and indicators that characterize the processes of life support in a crisis, as well as processes that impede the implementation of aggregate anti-crisis measures (Biyakov 2004). Since these indicators are heterogeneous in terms of units of measurement, there is a problem of comparing them. At the second stage, the comparison of indicators is solved by means of the procedure of smoothing the initial data. For primary processing of time series, the procedure of smoothing - median is offered. Let the time series A_1, A_2, \dots, A_K be given, then each new element of the smoothed series C_i is calculated by the following formula:

$$C_i = I + (A_i - Me) / (A_{max} - A_{min} + I), i = 1 \dots k, \quad (1)$$

where Me is the median of the time series, A_{max} is the maximal member of the series, A_{min} is the minimum member of the series.

It should be noted that when trying to approximate the original data and the median-smoothed data, we obtain almost the same type of functions. This means that when calculating, for example, the growth rates after the median transformation in each time series there are no zero and negative components with almost complete coincidence of this trend with the original one. Here we get a serious advantage, especially if the calculations use value indicators (financial results of economic activity).

At the third stage of model building the actual rank series of movement of indicators are formed. To do this, it is necessary to calculate the growth rate of the indicators, to calculate the acceleration and changes in the values of the indicators. Finally, the list of indicators is ranked according to the decreasing value of the acceleration of their movement. In other words, the first rank is assigned to the indicator with the greatest acceleration, and the last rank is assigned to the indicator with the least acceleration. Based on these calculations, the rank matrix of indicator movement is constructed (table 1).

Table 1. Ranking matrix of the movement of indicators

Indicator name	Criterion order of movement	Actual order of movement by period				
		T1	T2	T3	...	TK
Indicator 1	1	X_{11}	X_{12}	X_{13}	...	X_{1K}
Indicator 2	2	X_{21}	X_{22}	X_{23}	...	X_{2K}
>Indicator 3	>3	X_{31}	X_{32}	X_{33}	...	X_{3K}
...
Indicator N	N	X_{N1}	X_{N2}	X_{N3}	...	X_{NK}

At the fourth stage two rank series are compared: criterial and actual. These series, as a rule, differ from each other by the difference between the numbers of individual indicators and the inversion of one complete series in relation to the other. In this method it is necessary to assess the proximity of the actual and normative orders. For this purpose Spearman and Kendall rank correlation coefficients are used.

The Spearman rank correlation coefficient is calculated on the basis of two steps. The first step - for each indicator from the list the square of the difference (deviation) between its place (rank) in the normative ordering and the rank in the actual ordering is calculated according to the formula:

$$Y_i = (X_i - X_k)^2, \quad (2)$$

where Y_i – the difference between the rank of the i -th indicator in the criterial ordering and the actual one, X_k – the rank of the indicator in the criterial ordering, X_i – the rank of the indicator in the actual ordering.

Second step. The sum of squares of deviations for all indicators in the time period under consideration is calculated and the Spearman coefficient is calculated according to the formula:

$$K_{deviat} = 1 - \frac{6 \times \sum_{i=1}^N Y}{N \times (N^2 - 1)} \quad (3)$$

Kendall's rank correlation coefficient is calculated at two levels. At the first level, for each indicator, the number of other indicators with a place in the criterial ordering greater than that of the indicator in question, and in the actual ordering, a rank smaller than that of the indicator in question, is calculated:

$$S = \sum_{p=k+1}^N a_p, a_p = \begin{cases} 1, x_k > x_i \\ 0, x_k < x_i \end{cases} \quad (4)$$

where k – the place of the indicator under consideration in the criterial ordering, S is the number of inversions for a given indicator, p – the places of the indicators compared to the indicator under consideration, N – the number of indicators included in the list of system characteristics, a_p is a function showing whether or not the indicator in question is inversion with the indicator compared to it (if yes, then $a_p = 1$, otherwise $a_p = 0$), x_k (x_i) is the rank of the indicator in the actual ordering that has k (p) place in the criterial ordering.

At the second level, the total number of inversions for all indicators is calculated and the Kendall correlation coefficient is determined:

$$K_{invers} = 1 - \frac{4 \times \sum_{i=1}^N S}{N \times (N - 1)} \quad (5)$$

Both coefficients (K_{deviat} , K_{invers}) estimate the closeness of the given rank series to the reference (criterion) series on the interval from 1 to +1. The score +1 is obtained when the actual series coincides with the criterion series, and 1 when they are completely differently directed.

The indicator of the resulting assessment of the proximity of the actual structure of the system indicators movement to the criterial (benchmark), based on the two rank correlation coefficients for a given time period, can be calculated by the formula:

$$R = \frac{(1 + K_{deviat}) \times (1 + K_{invers})}{4} \quad (6)$$

The resulting evaluation shows to what extent the nature of changes in the structure of the links of the system corresponds to the chosen evaluation criterion. In other words, we can say that this indicator allows us to evaluate the effectiveness of the managerial decisions made in accordance with the criterion set. The range of variation of this index is from 0 to +1. At that, 1 – full coincidence of changes in the structure of the system connections with the chosen criterion; 0 – full discrepancy of changes in the system concerning the chosen criterion.

In addition to the quantitative assessment of the use of the potential of the region's economic space, a qualitative assessment is also calculated. The qualitative assessment of the weighting coefficients is calculated on the basis of the use of an exponential dependence on the number inverse of the ordinal number.

$$w_i = \frac{e^{(1/i)}}{\sum_{j=1}^n e^{(1/j)}} \quad (7)$$

where w_i – weighting coefficient of the indicator occupying the i -th place in the block, e is the base of the natural logarithm, n is the number of indicators in the block.

Border territories, being at the same time peripheral due to their remoteness from the centers of growth and attraction, are mostly depressed or underdeveloped (Sohn 2014). Mitigation of interregional contrasts in the conditions of the crisis, pulling backward and depressed regions up to highly developed territories is the main task of state authorities.

4. Results

The pandemic showed that COVID-19 did what no other virus has managed to do in the last century. During the pandemic, not only the economy, but also the social life of the population was significantly affected: quarantine, isolation, other restrictions on human freedoms, the loss of loved ones and the complete uncertainty of what comes next. Thus, COVID-19 has become a complete scientific puzzle for world science, and the threat of infection is now more relevant than it used to be (Korolev 2020; Wu *et al.* 2020; Coccia 2020; Janssen & van der Voort 2020). In the Baltic region, the pandemic has affected all countries, limiting the normal freedom of movement of goods, persons, services and capital. Particularly large costs have occurred in cross-border integration and internationalization processes (Klatt 2020; Jańczak 2020; Hennig 2021). In the conducted research it was shown that in the Baltic Sea countries, the course of the pandemic has revealed all the contradictions and possible costs that characterize this artificial crisis. This is evidenced by the GDP data (table 2).

Table 2. Gross domestic product of the EU Baltic Sea countries

Baltic Sea countries	GDP (current prices, million euros)		Real GDP growth rate, %		GDP per capita, euros	
	2019	2020	2019	2020	2019	2020
Germany	3,449,050	3,332,230	0.6	-4.9	41,510	40,070
Poland	532,329.2	521,514.5	4.5	-2.7	13,870	13,600
Sweden	474,550.5	472,260.1	1.4	-2.8	46,170	45,610
Denmark	312,747.2	311,726	2.8	-2.7	53,760	53,470
Lithuania	48,797.4	48,794.2	4.3	-0.8	17,460	17,460
Latvia	30,420.9	29,334	2.0	-3.6	15,900	15,430
Estonia	28,112.4	27,166.9	5.0	-2.9	21,220	20,440
Finland	240,261	237,467	1.3	-2.8	43,510	42,940

Source: compiled from Eurostat data

It should be noted that Lithuania, Sweden and Estonia (7,721.52; 7,369.57 and 7,346.66 respectively) have the highest number of cases per 100,000 people, although detected COVID-19 cases are highest in Germany and Poland (table 3). However, the most “severe” indicator, which characterizes the state and the course of the pandemic is the mortality rate per 100,000 people. That’s why Poland and Sweden are ahead of other countries of the Baltic Sea (131.48 and 131.32 respectively). This indicator is exceptionally hard for the population and clearly shows that state administration bodies and other institutions of the states do not cope with the epidemic of coronavirus in full measure. It should be noted that in the Baltic Sea countries the pandemic scenarios were formed more optimally compared to other European states. The calmer situation was achieved by timely restrictive measures on public transport and crowded areas, quarantine measures and some more conscious public

attitude towards the pandemic. Nevertheless, even in those countries, in which the incidence rates are lowest, population is experiencing the full impact of the crisis.

Table 3. Main characteristics of the epidemic spread in the EU Baltic Sea countries as of March 24, 2021

Baltic Sea countries	Population at the beginning of 2021	The total number of detected	Number of cases per 100,000 people.	Mortality	Mortality per 100,000 people.
Germany	83,166,711	2,647,710	3,192.39	74,964	89.47
Poland	37,958,138	2,089,869	5,521.94	49,761	131.48
Sweden	10,327,589	744,272	7,369.57	13,262	131.32
Denmark	5,822,763	226,277	3,906.58	2,402	41.47
Lithuania	2,794,090	210,202	7,721.52	3,501	128.61
Latvia	1,907,675	97,586	5,173.69	1,828	96.91
Estonia	1,328,976	97,456	7,346.66	809	60.99
Finland	5,525,292	72,073	1,300.79	808	14.58

Source: compiled from World Health Organization data.

Among the countries of the Baltic Sea is also the Russian Federation. However, due to non-comparable proportions and differences in law, standards, and statistical reporting, separate studies are proposed for the Northwestern Federal District. This district is of great importance for the development of the whole economy of Russia. Firstly, it is located at the junction with developed EU countries and has more chances to integrate into the world economy than regions of other districts. Secondly, the border regions have access to the Baltic Sea and occupy a prominent place in the maritime activities of the whole country. Thirdly, the only exclave territory of Russia – Kaliningrad region – is located in this district.

Studies conducted on the spread of the COVID-19 epidemic in the Northwestern Federal District of Russia clearly show that the dynamics of disease spread in NWFD regions differ significantly. The northern regions of the NWFD differ in disease detection. In the Arkhangelsk and Murmansk regions 54,586 and 45,371 diseases were detected respectively. In the Arkhangelsk oblast over 48 thousand people recovered during this period, and in the Murmansk oblast over 43 thousand people died 552 and 886 people respectively. High morbidity level was also registered in Komi Republic: over 38 thousand infected people, over 36 thousand people recovered and 730 died. By February 15 the situation was gradually stabilizing and the number of new infections in these regions was over 100 people each. The situation is somewhat different in regions bordering the European Union. These are the Kaliningrad, Novgorod and Pskov regions and the Republic of Karelia. In these regions the number of detected cases was in the range of 30 thousand people, more than 20 thousand people recovered. At the same time, the number of deaths was 232 in Kaliningrad Oblast, 155 in Pskov Oblast and 113 in Novgorod Oblast (table 4).

Table 4. Main characteristics of the epidemic spread in the Northwestern Federal District as of February 15, 2021

Northwestern Federal District	Retrieved	New	Active	Recovered	Dead
Arkhangelsk region	54,586	194	5,445	48,589	552
Nenets Autonomous Okrug	1,075	1	24	1,007	4
Vologda region	36,682	231	4,074	31,895	713
Kaliningrad region	26,616	148	2,451	23,933	232
Republic of Karelia	38,889	165	4,208	34,410	271
Komi Republic	38,338	121	616	36,992	730
Leningrad region	33,784	191	2,828	30,446	510
Murmansk region	45,371	144	1,378	43,107	886
Novgorod region	25,965	110	3,453	22,399	113
Pskov region	30,806	104	10,824	19,827	155
St. Petersburg	354,196	1,093	74,481	269,203	10,512

Source: compiled from Stopcoronavirus data

The high level of infection in the northern regions of the Northwestern Federal District can be explained by the fact that the population there is concentrated in several cities with a very high proportion of migrants and active interaction of the population with other cities and countries. Temporary workers come to the northern regions for construction projects (due to high wages), while locals always prefer to travel to southern regions and countries for holidays.

The city of St. Petersburg stands out sharply from other subjects in the Northwestern Federal District of Russia. This city has the official status of a separate subject of the Russian Federation and has a great influence on the neighboring regions of the district. In St. Petersburg, 354,196 people have been diagnosed with coronavirus. This figure can be safely compared to the population of all the separately taken large cities-regional centers of the NWFD. St. Petersburg has the largest agglomeration in the Northwestern Federal District of Russia. The mobility of the population and the potential for infection here is very high. If we consider that the tradition of internal Russian migrants confirms close ties with the place of origin, labor migrants contribute to the spread of coronavirus infection when returning home from St. Petersburg or on shift work (temporary work limited to a period of 2-3 weeks) to the North. Increased mobility of migrants as well as tourism has become one of the most important factors in the spread of infection throughout the county. The spread of coronavirus in cities-regional centers also confirms a definite trend in the spread of infection.

In contrast to the average indicators for the federal district, the variation in the given indicators is much greater in the regions (table 5). For example, by the level of variation by two times, and the ratio between the maximum and minimum levels also differs by more than two times. The highest average nominal wages are fixed in the northern regions: the Murmansk Oblast – 74,358 rubles; the Komi Republic – 61,270 rubles; the Arkhangelsk Oblast – 58,637 rubles and of course the city of Saint Petersburg. Here nominal wages have been above 64,000 rubles for a long time. In traditionally European regions: Novgorod, Pskov and Kaliningrad regions, nominal wages are keeping over 30 thousand rubles. the growth rate of nominal wages during the pandemic slowed down a little. However, in most regions of the Northwestern District annual growth rates of nominal wages were observed (from 11.4% – the Vologda region to 0.8% – the Novgorod region). By the way, Novgorod oblast was minus 1.9% in real wage growth.

Table 5. Indicators of wages, inflation and unemployment in the regions of the Northwestern Federal District in 2020

Northwestern Federal District	Average monthly nominal wage, May 2020, rubles.	CPI, growth in January-June 2020 to January-June 2019, %	Growth of real wages, January-May 2020 to January-May 2019, %.	Unemployment rate, Q2 2020, %	Increase in unemployment, Q2 2020 to Q2 2019, %	Socio-Economic Stress Index, CPI + increase in unemployment
Northwestern Federal District	55,793	2.9	4.5	5.0	1.5	4.4
Arkhangelsk region	58,637	3.6	3.8	7.8	1.5	5.1
Vologda region	42,910	3.1	8.2	6.5	2.7	5.8
Kaliningrad region	36,661	2.7	4.2	5.2	0.5	3.2
Republic of Karelia	47,313	2.9	5.5	9.4	1.7	4.6
Komi Republic	61,270	4.1	2.6	8.3	1.0	5.1
Leningrad region	47,545	2.5	2.7	5.1	1.2	3.7
Murmansk region	74,358	2.9	6.4	8.2	3.5	6.4
Novgorod region	31,892	2.9	-1.9	5.7	2.6	5.5
Pskov region	32,473	2.2	5.8	6.8	1.7	3.9
St. Petersburg	64,265	2.7	4.5	2.7	1.3	4.0

Source: compiled from Federal State Statistics Service data

Studies on the level of unemployment show that the Northwestern District has lower indicators compared to other districts of the Russian Federation. In the regions of the NWFD the level of unemployment is traditionally high in the northern regions. For example, in the Republic of Karelia – 9.4% (unemployment growth of 1.7%); Murmansk and Arkhangelsk regions – 8.2% and 7.8% respectively (unemployment growth of 3.5% and 1.5%). The unemployment rate in the Komi Republic was higher than the national average – 8.3%, while the unemployment rate increased by 1.0%. The lowest level of unemployment was in Leningrad and Kaliningrad regions – 5.1% and 5.2% respectively (unemployment increased by 1.2% and 0.5%). It should be noted that in the NWFD the greatest damage from the pandemic crisis was observed in the spheres of retail trade, services and services, as well as in transport. The analysis shows that in these areas the situation worsened to such an extent that it created a zone of socio-economic stress and risk.

5. Discussion

Nowadays it is becoming obvious that COVID-19 has struck the economic and political systems of many countries and regions (Humer 2020). Science is looking for indisputable methods and indicators to overcome these unexpected crisis phenomena. If we consider the situation in the NWFD of Russia, one can refer to the sample of key indicators that affect the development of pandemic processes when diagnosing these phenomena (table 6). In the table below the main indicators influencing the development of crisis phenomena in the course of coronavirus for each NWFD region were shown.

Table 6. Values of the main indicators influencing the development of crisis phenomena

Northwestern Federal District	Share of urban residents in the total population, %	Demo-geographical potential of the region, people per 1 km ²	Poverty rate, %	Life expectancy at birth, years	Number of beds per capita	The number of employed people entering the region to work, % of the employed population of the region
Arkhangelsk region	78.5	53.5	12.5	72	5.2	1.01
Nenets Autonomous Okrug	73.3	17.7	9.7	71.5	5.2	18.21
Vologda region	72.6	197.8	13.6	71.3	4.2	0.72
Kaliningrad region	77.7	45.4	13.7	72.6	4.4	0.45
Republic of Karelia	80.7	100.5	15.6	70.7	4.4	0.63
Komi Republic	78.2	47.1	14.9	71.1	4.3	4.33
Leningrad region	64.3	3414.9	8.4	72.5	2.3	2.09
Murmansk region	92.2	23.6	9.9	71.7	6.4	2.26
Novgorod region	71.3	407.4	13.8	69.7	2.8	0.79
Pskov region	71.7	190.7	17	70	3.3	0.38
St. Petersburg	100	1247.3	6.6	75.5	4.3	7.34

Source: compiled from Federal State Statistics Service data

The overall impact on the crisis phenomena developed in the regions of the district shows that the largest cities and the agglomerations formed around them experience the greatest risks. This is understandable, since agglomerations have a higher population density and a greater intensity of interaction, especially due to migrant workers in the northern regions of the district, including rotational* settlements with a single ventilation system.

* Rotational camps are a complex of residential, cultural, amenity, sanitary and household buildings and structures designed to ensure the life of rotational workers located at the closest distance to the objects of work.

The current economic crisis has no analogues either in the world or in Russia, as for the first time it is caused by epidemiological, rather than economic or political factors. The ESG-rating (RAEX, 2021) conducted among the regions of the Northwestern Federal District shows that the highest social risks are in the Pskov and Vologda regions (70 and 48 respectively) and the greatest environmental risks are identified in the Komi Republic and the Nenets Autonomous District and Karelia Republic (82, 81 and 80 respectively). In the conducted rating a great attention was paid to the quality of management. According to this rating, the Nenets Autonomous Okrug, Leningrad Oblast and Saint Petersburg perform best (table 7).

Table 7. ESG-rating of the regions of the Northwestern Federal District in 2020

Northwestern Federal District (NWFD)	Environmental	Social	Governance	Place in the ESG ranking	Place in the NWFD
Arkhangelsk region	73	41	66	71	8
Nenets Autonomous Okrug	81	1	13	21	3
Vologda region	13	48	41	29	5
Kaliningrad region	67	22	47	54	7
Republic of Karelia	80	40	42	76	9
Komi Republic	82	42	48	78	10
Leningrad region	18	9	17	8	1
Murmansk region	78	14	20	53	6
Novgorod region	8	45	19	11	2
Pskov region	66	70	79	80	11
St. Petersburg	70	6	18	23	4

Source: compiled from RAEX data

Some publications draw attention to the expected growth of social risks. In the NWFD, the expected growth will be leveled in the regions sparsely populated, specializing in oil and gas production (Nenets Autonomous Okrug and the Komi Republic). Oil and gas rent in these regions are intended for the welfare, health and education of the population.

6. Conclusion

It should be noted that the pandemic in the Baltic Sea countries and the NWFD regions was a very difficult lesson for all institutions of power, science (especially medicine), as well as for structures and institutions involved in ensuring the existence of people.

COVID-19, which broke out unexpectedly, has brought about many problems that humanity has never faced before. The study presents the results of actions undertaken by nation states, showing mistakes and miscalculations. This is illustrated by the conclusions drawn as a result of the COVID-19 project. These conclusions should be considered in the future when similar challenges and crises emerge.

The literature review section shows that the scientific literature has responded quite actively to the course of the pandemic and that new proposals, methods and tools have arisen. A detailed analysis of the course of COVID-19 was carried out, as well as what negative phenomena were noted and what measures were taken to eliminate them, using the example of the Baltic Sea countries and border regions of the Northwestern Federal District of the Russian Federation.

The border regions of the Northwestern Federal District of Russia could not avoid mistakes either. These issues are discussed in the discussion section. In the northern regions, where there was a massive movement of labor force and population, the infection rates were much higher than in the entire Russian Federation. COVID-19 was

much more severe in underdeveloped regions, where there was a lack of basic resources and personnel in medical institutions, so the infection rates were high.

Thus, the proposed diagnosis in this study provides specific tools, methodology and forecasting for the outgoing from the coronavirus crisis, as well as the adoption of specific measures to assist affected businesses, business entities, the population and the definition of precautionary measures for the prevention and treatment of viral diseases. The materials of the study are of interest to scientists and practitioners who deal with the problems of crisis phenomena in regional and border systems, as well as challenges and emerging phenomena similar to the COVID-19 coronavirus pandemic.

References

- Adams-Prassl, A., Boneva, T., Golin, M., & Rauh, C. (2020). Inequality in the impact of the coronavirus shock: evidence from real time surveys, *IZA*. Retrieved April 21, 2020, from <https://www.inet.econ.cam.ac.uk/working-paper-pdfs/wp2018.pdf>
- Baker, S.R., Bloom, N., Davis, S.J., & Terry, S.J.. (2020). COVID-Induced Economic Uncertainty. *National Bureau of Economic Research*. Retrieved March 12, 2021, from <https://www.nber.org/papers/w26983>. <https://dx.doi.org/10.3386/w26983>
- Balashov, A.P. (2004). *Antikrizisnoe upravlenie*. Novosibirsk, 167.
- Beland, L.-P., Brodeur, A., & Wright, T. (2020). The Short-Term Economic Consequences of Covid-19: Exposure to Disease, Remote Work and Government Response, *Social Science Research Network*. Retrieved April 16, 2021, from <https://papers.ssrn.com/abstract=3584922>
- Belyaev, A.A. (2015). *Antikrizisnoe upravlenie*. Moskva: YUniti, 311.
- Bilchak, M. (2011). On the assessment of cross-border regions' development potential, *The Baltic Region*, 2(8), 119–124. <https://dx.doi.org/10.5922/2079-8555-2011-2-14>
- Biyakov, O.A. (2004). *Teoriya ekonomicheskogo prokonstranstva: metodologicheskij i regional'nyj aspekty*. Tomsk: Izdatelstvo Tomskogo universiteta.
- Brezna, N. (2021). The welfare state and risk perceptions: The Novel Coronavirus Pandemic and public concern in 70 countries. *European Societies*, 23 (1), 33–46, <https://doi.org/10.1080/14616696.2020.1793215>
- Coccia, M. (2020). Factors determining the diffusion of COVID-19 and suggested strategy to prevent future accelerated viral infectivity similar to COVID. *Science of the Total Environment*, 729. <https://dx.doi.org/10.1016/j.scitotenv.2020.138474>
- Claeson, M. & Hanson, S. (2021). COVID-19 and the Swedish enigma. *The Lancet*, 397 (10271), 259–261. [https://dx.doi.org/10.1016/S0140-6736\(20\)32750-1](https://dx.doi.org/10.1016/S0140-6736(20)32750-1)
- Ehlert, A. (2020). The socio-economic determinants of COVID-19: A spatial analysis of German county level data. Retrieved April 16, 2021, from <https://www.medrxiv.org/content/10.1101/2020.06.25.20140459v1>. <https://dx.doi.org/10.1101/2020.06.25.20140459>
- Federal State Statistics Service. Retrieved February 22, 2021, from <https://eng.rosstat.gov.ru>
- Hauser, A., Counotte, M., Margossian, C., Konstantinoudis, G., Low, N., Althaus, C., & Riou J. (2020). Estimation of SARS-CoV-2 mortality during the early stages of an epidemic: a modelling study in Hubei, China and Northern Italy. Retrieved February 2, 2021, from <https://www.medrxiv.org/content/10.1101/2020.03.04.20031104v3>. <https://dx.doi.org/10.1371/journal.pmed.1003189>
- Hennig, A. (2021). The spatial dimension of coronavirus crisis management and the role of subnational actors in the German-Polish border region. *European Societies*, 23(1). <https://dx.doi.org/10.1080/14616696.2020.1846065>

Hensvik, L., Le Barbanchon, T., & Rathelot R. (2021). Job search during the COVID-19 crisis. *Journal of Public Economics*, 194. Retrieved March 1, 2021, from <https://www.sciencedirect.com/science/article/pii/S0047272720302139>. <https://dx.doi.org/10.1016/j.jpubeco.2020.104349>

Humer, A. (2020). The Corona pandemic is probing our societal basis: the functioning of Service of General Interest in cities and regions. Retrieved May 19, 2021, from <https://ersa.org/forumcoronavirus/>

Janssen, M., & van der Voort, H. (2020) Agile and adaptive governance in crisis response: lessons from the COVID-19 pandemic. *International Journal of Information Management*, 55. <https://dx.doi.org/10.1016/j.ijinfomgt.2020.102180>

Jańczak, J. (2020). The German-Polish border, re-bordering and the pandemic: centers vs. peripheries? Working Paper Series B/ORDERS IN MOTION Nr. 8, Frankfurt (Oder), Vadrina, 17–19. January 22, 2021, from <https://repozytorium.amu.edu.pl/bitstream/10593/25862/1/129.%202020%20G-P%20border%20under%20Covid.pdf>

Kucharski, A.J., Russell, T.W., Diamond, C., Liu, Y., Edmunds, J., Funk, S., & Eggo, R.M. (2020). Early dynamics of transmission and control of COVID-19: A mathematical modelling study. *Lancet Infect. Diseases*, 20(5), 553–558. [https://dx.doi.org/10.1016/S1473-3099\(20\)30144-4](https://dx.doi.org/10.1016/S1473-3099(20)30144-4)

Klatt, M. (2020). What has happened to our cross-border regions? Corona, unfamiliarity and transnational borderland activism in the Danish-German borderregion. *Borders in Perspective*, 4, 43–47.

Knickel, M., Neuberger, S., Klerkx, L., Knickel, K., Brunori, G., & Saatkamp, H. (2021). Strengthening the Role of Academic Institutions and Innovation Brokers in Agri-Food Innovation: Towards Hybridisation in Cross-Border Cooperation. *Sustainability*, 13(4899). <https://dx.doi.org/10.3390/su13094899>

Knight, F. (2017). *Risk, uncertainty and profit*. New edition, Wilmington: Vernon Art and Science Incorporated.

Korolev, I. (2020). Identification and Estimation of the SEIRD Epidemic Model for COVID-19. Retrieved February 8, 2021, from <https://ssrn.com/abstract=3569367>. <https://dx.doi.org/10.2139/ssrn.3569367>

Korotkov, M. (2020). *Antikrizisnoe upravlenie*. Moskva: Urajt, 406.

König, M., & Winkler, A. (2021). COVID-19: Lockdowns, Fatality Rates and GDP Growth. *Intereconomics*, 56, 32–39. <https://dx.doi.org/10.1007/s10272-021-0948-y>

Larionov, I.K., Bragin, N.I., & Gerasin, A.N. (2019). *Antikrizisnoe upravlenie*. Moskva: Dashkov i K°, 380.

Ludvigson, S.C., Ma, S., & Ng, S. (2020). COVID-19 and the Macroeconomic Effects of Costly Disasters. *National Bureau of Economic Research*. Retrieved February 11, 2021, from <https://www.nber.org/papers/w26987>. <https://dx.doi.org/10.3386/w26987>

Marinov, M. (2020). Denmark and COVID-19, *BSP Policy Briefing Series*, 5. Retrieved February 11, 2021, <https://www.researchgate.net/publication/346036552>

Opłowska, E. (2021). The Covid-19 crisis: the end of a borderless Europe? *European Societies*, 23(1). <https://dx.doi.org/10.1080/14616696.2020.1833065>

RAEX. Retrieved January, 29, 2021 from https://raex-a.ru/rankings/regions/ESG_raiting#metodika

Shet, A., Ray, D., Malavige, N., Santosham, M., & Bar-Zeev, N. (2020). Differential COVID-19-attributable mortality and BCG vaccine use in countries. Retrieved February 8, 2021, from <https://www.medrxiv.org/content/10.1101/2020.04.01.20049478v1>. <https://doi.org/10.1101/2020.04.01.20049478>

Sohn, C. (2014). Modelling Cross-Border Integration: The Role of Borders as a Resource. *Geopolitics*, 19(3), 587–608.

Stopcoronavirus. Retrieved February 15, 2021, from <https://stopкоронавирус.rf/information/>

Van Dam, Y.K. & Webbink, J.F. (2020). Reflecting on reflections on CoViD-19. *CEREM*, 4(2), 7–19. <https://dx.doi.org/10.29015/cerem.876>

Will, M. (2020). The CoViD-19 Pandemic and the End of Corporate Risk Management as we know it. *CEREM*, 4(3), 89–115. <https://dx.doi.org/10.29015/cerem.888>

World Health Organization. Retrieved March 24, 2021, from <https://covid19.who.int/table>

Wu, J.T., Leung, K., & Leung, G.M. (2020). Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. *Lancet Infect. Diseases*, 395, 689–697. [https://dx.doi.org/10.1016/S0140-6736\(20\)30260-9](https://dx.doi.org/10.1016/S0140-6736(20)30260-9)

Zemtsov, S., Barinova, V., & Semenova, R. (2019). The Risks of Digitalization and the Adaptation of Regional Labor Markets in Russia. *Foresight and STI Governance*, 13 (2), 84–96. <https://dx.doi.org/10.17323/2500-2597.2019.2.84.96>

Zgonnik, L.V. (2015). *Antikrizisnoe upravlenie*. Moskva: Dashkov i K°, 208.

Zizka, L. (2020). Coronavirus crisis communication: a wicked problem. Retrieved April 6, 2021, from <https://hospitalityinsights.ehl.edu/covid19-crisis-communication>

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COMPANY LIQUIDITY AS A REFLECTION OF RECEIVABLES AND PAYABLES MANAGEMENT*

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Abstract. A reliable statement of a company's financial position can be obtained by analyzing its ability to pay its liabilities. A financially stable company can pay its liabilities, and a company in financial difficulties has problems with this. For these reasons, it is important to keep the company's liquidity at an optimal level. The article aims to point out liquidity in the context of the image of receivables and liabilities management through the research method of analysis and comparison. The analysis was performed on the basis of the balance sheet of the selected company, where the asset structures were analyzed. We drew our attention to the receivables and liabilities of the analyzed company. We presented the results of the analysis in the final part of the article.

Keywords: transformation process; receivables; liabilities; liquidity ratios; management of receivables and liabilities

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1. Introduction

Effective management of receivables and payables in companies is extremely important in every entity, as they are also linked to financial indicators such as liquidity, solvency, and indebtedness. A high level of receivables can cause an entity to become secondary insolvency, which can lead to an increase in liabilities and ultimately the inability to repay them. Each entity should monitor, in addition to liquidity, the ratio of own funds to liabilities. If foreign resources exceed own funds, it means a high indebtedness for the entity, which is an undesirable situation for the company as well as for the company's surroundings. The aim of companies should be to manage receivables and payables and achieve their declining state.

2. Literature review

Receivables and payables are an important part of the financial statements within the balance sheet. The time structure of receivables and payables is also important, ie whether they are long-term or short-term receivables and payables. The high level of receivables for the entity represents the risk that it will not have the necessary amount of cash available to pay due liabilities. A high level of liabilities is also a negative phenomenon for the entity, as it threatens the financial stability of the company. These and other findings are presented by the authors in their publications: Alex, 2005; Farkaš, 2020; Jenčová & Rákoš, 2010; Štangová et al., 2012; Kieso & Weygandt, 2007; Šuranová & Škoda, 2007; Stewart & Connolly, 2021; Sacer & Zyznarska-Dworczak, 2020; Henrique et al. 2020; Bernstein & Wild, 1999; Hellmann & Patel, 2021; Tawiah & Gyapong, 2021.

Receivables and payables form the basis for calculating liquidity. Liquidity is divided into three levels: liquidity of the 1st, 2nd, and 3rd degree. The resulting values of these indicators predict the current solvency of the company. The following information is provided by the authors: Zalai, 2016; Miah, 2021; Jakubec & Kardoš, 2016; Roca, 2021; Oreský & Rehák 2019; Vlachynský et al., 2009; Wijekoon et al., 2021; Fabus, 2015; Lombardi, et al., 2020; Kajanová, 2014; Mládek, 2005; Miah et al., 2021, Štangová & Hajduchová, 2010; Savina et al., 2021; Kajanová et al., 2014.

Management of receivables and payables for the company means the financial health of the company, which will ensure the long-term operation of the company. The authors wrote about this idea in their publications: Daniel, 2013; Frintrup, et al., 2020; Gernon & Meek, 2001; Horváthová et al., 2016; Hillebrandt, M. & Leino-Sandberg, 2021; Kainth & Wahlstrom, 2021; Kotulič et al., 2018; Majduchová & Neumannová, 2008; Tumpach, 2006; Majduchova et al., 2020; Pavic, 2020; Riahi-Belkaoui, 2000; Šlosárová & Blahušiaková, 2020; Suhányiová & Fabian, 2010; Suhányiová, et al., 2016; Suhányiová, 2009; Suhányiová, 2011; Silva et al 2021a, 2021b.

3. The transformation process in the organization

In the transformation process of a company, production factors are combined and transformed as inputs into different types of outputs, i.e. products and services. To obtain the required outputs, the company carries out various activities (Majduchová et al., 2020; Natalizi, 2020).

The business transformation process is the process of transforming inputs into outputs, within which a measurable value is created in the form of products or services (Oreský & Rehák, 2019). This value arises through the individual activities that the company must provide.

There are two basic approaches to the transformation process, which are based on the above definition:

a / creation of measurable value - the basis is considered the process of conversion of individual inputs into finished outputs. This approach illustrates Gutenberg's model of the transformation process - it is the implementation of business activities - that ensure the transformation process and which are expressed in Porter's model of the transformation process (Table 1).

Table 1. Gutenberg model of transformational process

Financial sphere		
Financial outputs ←	Means of payment ←	Financial inputs ←
↓ PROCUREMENT →	PRODUCTION →	SALES ↑ →
Raw materials, materials, semi-finished products, machines, equipment, technologies, employees (company property and human resources)	Finished but unrealized products (previously unfinished but work in progress)	Performance results (realized products)
Material and commodity sphere		

Source: Majduchová & Neumannová (2008)

b / creation of monetary value. The monetary side of the transformation process is ensured by the company's finances, which form a system of monetary relationships, which the company enters into obtaining financial resources, placing and tying them in individual components of assets, productive use of assets, and distribution of results. Flow quantities are revenues and costs, as well as monetary income and expenses (Suhányiová, 2011).

3.1. Analytical view of the company's assets

The exact definition of property is determined by Act no. 431/2002 Coll. on accounting: Assets are the assets of an entity that are resulting from past events, it is almost certain that they will increase the economic benefits of the entity in the future, they can be measured reliably, and are recognized in the financial statements in the balance sheet, or statement of assets and liabilities. In terms of time, the assets are divided into:

- long-term asset,
- current assets.

When reporting assets in the balance sheet, it is theoretically possible to apply two approaches:

- the purpose of the acquisition of the assets is taken into account: the purpose expresses the relationship to the operating cycle,
- assets are ranked according to liquidity: liquidity is determined by the time required to convert assets into cash.

It is an asset that is divided from the most liquid assets to less liquid assets or, conversely, from the least liquid assets to the most liquid assets (Kajanová, 2014).

It is characteristic of double-entry bookkeeping that not only the assets are monitored, but also the origin of the assets, i.e. from which the accounting entity acquired individual parts of the assets, from which sources it financed them. Sources of coverage are called liabilities in accounting, they are part of the balance sheet. Liabilities are sources of assets, which represent the total amount of own and external sources of assets, are accounted for in account class 4 - Equity and long-term liabilities, account class 2 - Short-term financial liabilities, and account class 3 - Other short-term liabilities other than financial liabilities.

Foreign sources of asset coverage are referred to as liabilities.

3.2. Accounting relationships, a brief analysis of receivables and payables, liquidity

A receivable and a liability represent one business transaction between two parties to a relationship. The creation of one party to a business relationship is always associated with the creation of an obligation with the other party to a business relationship. When accounting and reporting receivables and payables, it is important to respect the principle of non-compensation (Farkaš, 2020). This means that if a receivable arises in an entity, it must be accounted for as a receivable at the time it arises. If a subsequent entity incurs a liability in the same context, it shall be recognized as a liability, not as a reduction in the receivable. The proof of accounting for receivables and payables is the documents proving their origin.

1/ Receivables

Receivables arise whenever there is a time mismatch between the occurrence of a particular business operation and the time of payment. From this point of view, receivables have many advantages, but also disadvantages.

The basic advantages of receivables include:

- a payment condition which is part of the commercial offer and marketing measures to promote sales,
- the length of the deferment of payment can become one of the essential elements of competitive advantage in the fight for market share.

The basic disadvantages of receivables include:

- there is always a risk of non-payment,
- a business loan must be financed by the company in some way, which means an increase in financial costs for it.

A company needs to manage receivables and payables.

The key issues of receivables management are:

- minimization of the time between the origin and payment of the receivable,
- minimizing the risk that the receivable will not be repaid by the debtor.

The management of receivables in the company takes place on two levels, namely prevention and enforcement. The task of prevention is to ensure that in the future there is no irretrievable, resp. late receivables. Recovery takes place in the case of an outstanding receivable.

2 / Liabilities

They represent an entity's existing obligation arising from past events, they are likely to reduce the entity's economic benefits in the future and can be measured reliably, they are recognized in the financial statements in the balance sheet, or in the statement of assets and liabilities.

The liability is the settlement relationship from the debtor's point of view. It is the debtor's obligation to fulfill his obligation to the creditor. The obligation expires, when it is settled by the debtors. It arises as a result of a transaction, can be valued (expressed in monetary units), and should lead to an outflow of funds.

3 / Liquidity and the need for its management

Liquidity means the current solvency of a company to pay its due liabilities and is a measure of immediate solvency.

Solvency means the current ability to settle liabilities. If the company is permanently illiquid (financial balance is disturbed, we speak of insolvency).

The basis of liquidity is the mutual relationship between the components of current (short-term) assets and short-term liabilities and in the financial sense. An enterprise is liquid when, at a particular date, it has sufficient funds to settle its payables. However, this seemingly simple statement has several problems:

1. the first problem concerns the time period,
2. the second problem is the correct interpretation of the expression "having at its disposal".
3. the third problem is related to the maturity of liabilities.

Liquidity means the conversion of funds. Substantially all of a company's assets, both non-current and current, can be converted into cash. (Kotulič et al., 2018). The conversion time varies from asset to asset. Receivables, resp. short-term assets are transformed into money faster, while long-term assets have a longer time of transformation into cash. The easier it is to transfer assets to money, the more liquid it is. However, there is also a risk that some types of assets will never be converted into money. We understand it as a measure of a property's ability to transform.

3.3. Liquidity ratios

The most common liquidity ratios are (Table 2):

Table 2. Quick ratio (liquidity grades: 1, 2, and 3)

Indicator	Characteristics	Recommended value	Calculation
Quick liquidity (Liquidity grade: 1.)	is the ability to repay short-term liabilities with the most liquid resources.	0,2 - 0,5	Quick ratio = <u>financial accounts</u> / short-term liabilities altogether
Current liquidity (Liquidity grade: 2)	is the ability to repay current liabilities with cash equivalents and receivables	1 - 1,5	Current liquidity = <u>financial accounts + receivables</u> / short-term liabilities together
Total Liquidity (Liquidity Grade: 3)	Is The Ability To Settle Current Liabilities Through Current Assets	1,8 - 2,5	Total Liquidity = <u>Financial Accounts + Receivables + Inventories</u> / Short-Term Liabilities Together

Source: Oreský & Rehák (2019, p. 125)

3.4. Analysis of receivables and payables management

We have solved the research project within several manufacturing companies, but in the mentioned article we numerically list the selected manufacturing company, which is representative of the problems occurring in the field of liquidity and its management in most of them. Based on data from the balance sheets of the selected company for the monitored periods, we prepared an analysis of the company's asset structure (Table 3), where we mainly monitored the distribution of assets in individual components in terms of inclusion of receivables (as part of assets) and liabilities (as part of resources). In the analysis of coverage sources (Table 4), we monitored the structure of own and foreign sources (Table 3).

Table 3. Analysis of the assets of the monitored company

Structure of assets (A)	2016		2017		2018		2019	
	Value in EURO (€)	% of A	Value in EURO (€)	% of A	Value in EURO (€)	% of A	Value in EURO (€)	% of A
TOTAL ASSETS	603 885	100,00	557 265	100,00	568 640	100,00	557 355	100,00
A. Non-current assets	291 624	48,28	266 776	47,87	251 142	44,17	251 500	45,12
A.I. Long-term intangible assets, total	0	0	0	0	0	0	0	0
A.II. Long-term tangible assets, total	291 624	48,30	266 776	47,87	251 142	44,16	251 500	45,12
A.II.1. Lands	46 429	7,68	46 429	8,33	46 429	8,16	46 429	8,33
A.II.2. Buildings	221 643	36,70	210 514	37,78	199 385	35,07	199 385	35,77
A.II. 3. Individual movables and sets of movables	23 552	3,90	9 833	1,76	5 328	0,93	5 686	1,02
A.III. Long-term financial assets, total	0	0	0	0	0	0	0	0
B. Current assets	312 261	51,71	290 489	52,13	317 498	55,83	305 855	54,88
B.I. Stocks - total	91 385	15,14	87 531	15,71	112 212	19,73	130 595	23,43
B.I.1. Material	91 422	15,14	87 091	15,63	111 355	19,58	131 426	23,58
B.I.2. Advances provided for inventories	-37	-0,006	440,00	0,08	857	0,15	-831	-0,15
B.II. Long-term receivables - total	110 089	18,23	102 728	18,43	80 000	14,07	60 000	10,76
B.II.1. Receivables from partners, members and associations	110 089	18,23	102 298	18,36	80 000	14,07	60 000	10,76
B.II.1. Other trade receivables	0	0	430,00	0,07	0	0	0	0
B.III. Short-term receivables - total	77 309	12,80	47 243	8,48	54 284	9,55	46 777	8,39
B.III.1. Trade receivables - total	47 325	7,80	47 243	8,48	54 284	9,55	37 787	6,78
B.III.1. 1. Other trade receivables	47 325	7,80	47 243	8,48	54 284	9,55	37 787	6,78
B.III.1.2. Tax receivables and subsidies	29 984	4,90	0	0	0	0	8 990	1,61
B.IV. Short-term financial assets - total	0	0	0	0	0	0	0	0
B.V. Financial accounts - total	33 478	5,54	52 987	9,51	71 002	12,49	68 483	12,29
B.V.1. Money	8 445	1,39	16 901	3,03	43 715	7,69	42 780	7,68
B.V.2. Bank accounts	25 033	4,15	36 086	6,48	27 287	4,80	25 703	4,61
C. Accruals	0	0	0	0	0	0	0	0

Source: Own processing based on balance sheets from 2016, 2017, 2018, and 2019.

The total value of the company's assets fluctuated from 2016 to 2019, while the highest value of assets for the monitored periods of assets was in 2016 and the lowest in 2017, which is a decrease of 7.7%. In 2019, the value of assets was € 557,355, which is also a decrease of 7.7%. The company has fixed assets of which the largest part always consists of tangible assets, particularly land and buildings, ie about 45%. The Company did not and does not have long-term intangible assets, long-term and short-term financial assets at its disposal.

Looking at the structure of assets, it is clear that the majority of current periods are current assets. It is more than 50% every year. A closer look at current assets revealed that inventories are dominated by material that has fluctuating value over all periods.

Long-term and short-term receivables decreased every year, we will discuss them in more detail in the following sections (Table 4).

Table 4. Analysis of sources of coverage of the company's assets

COVERING SOURCE STRUCTURE (SSt)	2 016		2 017		2 018		2 019	
	Value in EURO (€)	% of SSt	Value in EURO (€)	% of SSt	Value in EURO (€)	% of SSt	Value in EURO (€)	% of SSt
TOTA: EQUITY AND LIABILITIES	603 885	100,00	557 265	100,00	568 640	100,00	557 355	100,00
A. Equity	154 502	25,57	169 846	30,48	225 749	39,70	253 380	45,46
A.I. Basic equity	6639	1,10	6639	1,19	6639	1,17	6639	1,19
A.II. Share premium	0	0	0	0	0	0	0	0
A.III. Other capital funds	0	0	0	0	0	0	0	0
A.IV. Statutory reserve funds	500	0,08	500	0,09	500	0,09	500	0,09
A.IV.1. Statutory reserve funds and indivisible fund	500	0,08	500	0,09	500	0,09	500	0,09
A. V. Other funds from profit	0	0	0	0	0	0	0	0
A.VI. Valuation differences from revaluation - total	0	0	0	0	0	0	0	0
A.VII. Profit from previous years	232 908	38,56	147 363	26,44	162 707	28,61	218 610	39,22
A.VII.1. Retained earnings from previous years	232 908	38,56	147 363	26,44	162 707	28,61	218 610	39,22
A.VIII. Profit for the period after tax	-85 545	-14,17	15 344	2,76	55 903	9,83	27 631	4,96
B. Liabilities	449 383	74,41	387 419	69,52	342 891	60,30	303 975	54,54
B.I. Long-term liabilities - total	240	0,04	72	0,01	387	0,07	570	0,10
B.I.1. Trade long-term liabilities	0	0	0	0	0	0	0	0
B.I.2. Social fund liabilities	240	0,04	72	0,01	387	0,07	570	0,10
B.II. Long-term reserves	0	0	0	0	0	0	0	0

B.III. Long term bank loans	201 616	33,38	187 540	33,65	173 464	30,51	159 388	28,59
B.IV. Short-term liabilities - total	241 456	39,98	199 807	35,85	169 040	29,72	144 017	25,84
B.IV.1. Trade payables - total	226 066	37,43	180 701	32,43	146 110	25,69	131 697	23,63
B.IV.2. Other trade payables	226 066	37,43	180 701	32,43	146 110	25,69	131 697	23,63
B.IV.3. Payables to partners and associations	0	0	0	0	287	0,05	287	0,05
B.IV.4. Payables to employees	7 035	1,16	5 001	0,90	5 873	1,03	4 756	0,86
B.IV.5. Social security liabilities	3 931	0,65	3 166	0,56	3 515	0,62	2 868	0,51
B.IV.6. Tax liabilities and subsidies	903	0,14	10 833	1,94	13 255	2,33	4 409	0,79
B.IV.7. Other liabilities	3 521	0,57	106	0,02	0	0	0	0
B.V. Short- term reserves	0	0	0	0	0	0	0	0
B.VI. Current bank loans	6 071	1,005	0	0	0	0	0	0
B.VII. Short- term financial assistance	0	0	0	0	0	0	0	0
C. Accruals	0	0	0	0	0	0	0	0

Source: Own processing based on balance sheets from 2016, 2017, 2018, and 2019.

Looking at the sources of coverage, we found that the greater part consists of liabilities, on average 64.6% of total sources of coverage each year, and a smaller part is equity on average 35.3% each year. In the structure of sources of coverage for all monitored periods, equity has a different amount, which has an increasing tendency. It forms a smaller part of the total sources of coverage. While in 2016 the value of equity amounted to € 154,502, in the last monitored year 2019 its value increased by up to 64%, to a value of € 253,380.

From external sources, the amount of liabilities decreased overall during the period under review. The highest share of liabilities was represented by short-term liabilities on average 32.8% and long-term bank loans, which accounted for an average of 31.5% of liabilities.

In this part of the practical analysis of receivables, we discuss the development and management of long-term and short-term receivables of the company, which are important for the financial stability of the company. We follow the last four accounting periods, ie years 2016 - 2019. We also describe the methods of recovery of the company's receivables. The basis for this analysis is mainly statements from financial statements.

3.5. Receivables analysis

The clear status and structure of monitored long-term receivables are shown in Table 5, in which we analyze and compare individual accounting periods using indexing (Table 5).

Table 5. Status and structure of long - term receivables

	Value in EURO (€)				Index			
	2016	2017	2018	2019	2017/ 2016	2018/ 2017	2019/ 2018	2019/ 2016
Long-term receivables from partners, members and associations	110 089	102 298	80 000	60 000	0,93	0,78	0,75	0,54
Other trade receivables	0	430	0	0	0	0	0	0
Long-term receivables - total	110 089	102 728	80 000	60 000	0,93	0,78	0,75	0,54

Source: Own processing based on the company's financial statements from 2016 - 2019.

The sum of the company's long-term receivables for all periods consists of long-term receivables from partners, members, and associations, and other trade receivables. The highest value of long-term receivables, ie € 110,089, the company reached in 2016, which accounted for 18.23% of the company's total assets. The lowest value of long-term receivables was achieved by the company in 2019, t. j. € 60,000, which represents 10.76% of the total assets in a given year. Of the total long-term receivables, they always accounted for the highest value of receivables from partners, members, and associations. The value of the company's total long-term receivables from 2016 to 2019 had a declining trend.

The clear status and structure of monitored short-term receivables are shown in Table 6, in which we analyze and also compare individual accounting periods using indexing (Table 6).

Table 6. Status and structure of short-term receivables

	Value in EURO (€)				Index			
	2016	2017	2018	2019	2017/ 2016	2018/ 2017	2019/ 2018	2019/ 2016
Other trade receivables	47 325	47 243	54 284	37 787	0,99	1,15	0,69	0,79
Tax receivables and subsidies	29 984	0	0	8990	0	0	0	0,29
Short-term receivables - total	77 309	47 343	54 284	46 777	0,61	1,15	0,86	0,61

Source: Own processing based on the company's financial statements from 2016 - 2019.

For long-term receivables, we can see that they are still due. For the company, this means that debtors pay these receivables on time.

For short-term receivables, we see that they are not paid on time, most of the short-term receivables are paid overdue. This means for the company that the debtors do not meet the set payment deadlines and most of them pay after the due date.

If the receivables are not paid at all, the company must proceed to the recovery of these receivables. Also, in order to avoid incurring bad debts, it is the company's duty to create measures and devise ways of resolving these debts. And that already falls, de facto, into their management.

Methods of debt collection are possible:

1. telephone recovery - the company's economist contacts the debtor via the telephone line about the unpaid receivable, informs him about the fact that follows from it, and then listens to the feedback from the debtor, writes it down, and agrees with the debtor that immediately after the interview forwards a copy of the invoice and a list of outstanding items to the e-mail box. The aim is not to scare the debtor, but to achieve at least the promise of payment.
2. written recovery - the company's economist will send the debtor a written reminder defining the outstanding claim, also informing that there will be a suspension of supplies or withdrawal from the contract if the debtor does not pay the claim. The first reminder is sent only slightly by the company so that the debtor knows and does not forget that the claim needs to be paid. Only after the third written claim is the company willing to proceed to judicial enforcement

3.6. Liabilities analysis

In the analysis of liabilities, we will focus on determining the value and development of long-term and short-term liabilities of the company and also compare them with the use of indexing (Table 7).

Table 7. Structure of long-term liabilities

	Value in EURO (€)				Index			
	2016	2017	2018	2019	2017/ 2016	2018/ 2017	2019/ 2018	2019/ 2016
Long-term trade payables	0	0	0	0	0	0	0	0
Social fund liabilities	240	72	387	570	0,3	5,38	1,47	2,37
Long-term liabilities - total	240	72	387	570	0,3	5,38	1,47	2,37
Long-term reserves	0	0	0	0	0	0	0	0
Long-term bank loans	201 616	187 540	173 464	159 388	0,93	0,92	0,91	0,79

Source: Own processing based on the financial statements from the years 2016-2019.

The structure of the company's long-term liabilities consists of long-term bank loans and liabilities from the social fund (Table 8).

Table 8. Structure of current liabilities

	Value in EURO (€)				Index			
	2016	2017	2018	2019	2017/ 2016	2018/ 2017	2019/ 2018	2019/ 2016
Trade payables	226 066	180 701	146 110	131 697	0,8	8,81	0,9	0,58
Payables to partners and associations	0	0	287	287	0	0	1	0
Payables to employees	7035	5001	5873	4756	0,71	1,17	0,81	0,67
Social security liabilities	3931	3166	3515	2868	0,81	1,11	0,82	0,72
Tax liabilities and subsidies	903	10 833	13 255	4 409	11,99	1,22	0,33	4,88
Other liabilities	3521	106	0	0	0,03	0	0	0
Short-term liabilities – total	241 456	199 807	169 040	144 017	0,83	0,85	0,85	0,60
Short-term reserves	0	0	0	0	0	0	0	0
Current bank loans	6071	0	0	0	0	0	0	0
Short-term financial assistance	0	0	0	0	0	0	0	0

Source: Own processing based on data from financial statements 2016-2019.

The structure of short-term liabilities for all monitored periods consists of trade payables, payables to partners and associations, payables to employees, payables from social insurance, tax liabilities and subsidies, and other payables. Short-term liabilities also include short-term reserves, current bank loans, and short-term financial assistance. The largest part of liabilities consisted of trade payables, with the highest value in 2016, which accounted for 37.43% of the total sources of coverage. They had the lowest value in 2019, which represented 23.63% of the total sources of coverage. The company reported current bank loans only in 2016. The company did not have short-term reserves or short-term financial assistance.

The company's total short-term liabilities were declining, meaning that the company gradually repaid them.

3.7. Liquidity analysis

In this part of the analysis, we will focus on the solvency of the company. We will examine whether the company has sufficient liquidity, ie whether it can turn assets into money, with which it is then able to pay its liabilities. We selected ratios for liquidity analysis (Table 9).

Table 9. Result values - Ready liquidity (Level 1 liquidity)

Observed period	2016	2017	2018	2019
Value	0,13	0,27	0,42	0,47

Source: Own processing based on formulas and data from balance sheets from 2016-2019.

When calculating available liquidity, we put the ratio of financial accounts to short-term liabilities in total. Their value ranges from 0.2 to 0.5. This liquidity represents the narrowest view of current solvency at a given date and is used for day-to-day financial management. It is considered safe when at least 0.20 cents of the most liquid funds per 1 euro of commitments. The values of the ready liquidity of this company improved in the monitored period from year to year (2016 - 2019).

Based on our calculations, the value of ready liquidity in 2016 was 0.13, which did not even reach the recommended level and is therefore considered insufficient. In 2017, its value was 0.27, which represented an improvement compared to 2016, and an increase also occurred in 2018 to 0.42. ensuring ready liquidity. The highest value was in the last monitored year 2019, t. j. 0.47, which in this case meant that the company had sufficient secured liquidity. These calculations show us that the company should focus on increasing this indicator in order to be able to face short-term financial outages or other performance (Table 10).

Table 10. Result values - Current liquidity (Level 2 liquidity)

Observed period	2016	2017	2018	2019
Value	0,91	1,02	1,21	1,21

Source: Own processing based on formulas and data from balance sheets from 2016-2019.

Within current liquidity, we put into ratio financial accounts with short-term receivables to total short-term liabilities. The value of this indicator is 1-1.5. This indicator expresses the company's ability to cover current needs and debts with cash and receivables. Based on the calculations, the value of current liquidity in 2016 was 0.91, which means that it did not even reach the recommended level. In the following year 2017, the company reported a value of 1.02, which means a slight improvement in this indicator compared to 2016.

In 2018 and 2019 it reached the same level t. j. 1.21, which meant that the company secured regular liquidity to a sufficient extent. However, overall we see an improvement for all monitored periods, but even so, this indicator should improve so that the company is more prepared for possible financial fluctuations (Table 11).

Table 11. Result values - Total liquidity (Level 3 liquidity)

Observed period	2016	2017	2018	2019
Value	1,30	1,45	1,8	2,12

Source: Own processing based on formulas and data from balance sheets from 2016-2019.

With total liquidity, we put into ratio financial accounts with receivables and inventories to short-term liabilities together. The value of this indicator ranges from 1.8 to 2.5. This indicator is used for long-term evaluation of the development of the company's solvency.

In 2016, the value of 1.30 was reported in our calculations of total liquidity, which means that the company did not reach even the recommended value, it was also in the following year 2017, where it reached a value only slightly higher, i.e. 1.45. This indicates a lack of overall liquidity. However, in the following years, its values improved. In 2018, the value reached the level of 1.8, which means that the company's solvency improved, and in

the last monitored year 2019, the company had the best value of i.e. 2.12, which is a prerequisite for improving overall solvency in the future.

The values of ready, current, and total liquidity were at a safe level only in the last monitored years 2018 and 2019. They could be considered safe when their value was at the recommended level.

Final evaluation and recommendations

Within the research project, based on the performed analysis, we found the following facts:

1 / In all monitored periods, the company reported the predominant amount of total liabilities over receivables.

To improve the situation in the company, we have proposed several framework solutions:

- reassessment of the company's production structure (to produce more efficiently)
- workforce optimization,
- optimization and setting up trading (searching for new opportunities and customers)
- creation of reserves.

With these changes, in addition to reducing production costs and streamlining production as a whole, we will also shorten the time between production and sales of the product, which will have an impact on the overall reduction of payables.

2 / In the area of receivables and liabilities management:

From the analysis, we found that the company has many short-term receivables, in which the debtors paid their receivables only after the real maturity. The company could approach the following solutions:

- prevention of bad debts, search for new customers,
- verification of customers, which means closer verification of their financial situation,
- adjustment of receivables due dates,
- better communication and re-meetings with debtors,
- the pre-determined specific performance of claims and the precise conditions for performance,
- benefits for customers for early payment of invoices,
- penalties for non-compliance with due dates,
- receivables insurance.

The company should always strive to get its customers to pay their debts on time. It should take precautionary measures to prevent late or bad debts, thereby not focusing on their recovery and also choosing appropriate methods to apply and lead customers to meet their obligations.

3 / In the area of liquidity

Based on the calculations of ratios, we found insufficient liquidity. This problem can be solved as the condition has gradually improved. We have proposed the following solutions:

- sale of unnecessary stocks and monetizable means of production,
- reduction of liabilities, increase of receivables, ie plan of their management

- get rid of loans,
- check the condition of the rolling stock and the costs incurred annually for its operation,
- develop a cash flow management plan in the company.

In order to achieve a better level of liquidity, we mainly recommend companies reduce liabilities and increase receivables. As mentioned above, shorten the maturities of receivables (revenue invoices) and increase the maturities of liabilities (cost invoices). For short-term receivables, the company should focus on increasing short-term financial assets that have very high liquidity. This applies mainly to cash (the company had a higher amount every year), money in accounts (the company has enough), but we would also recommend securities that can be sold at any time. The risk is that the company has a larger amount of loans from banks. The best recommendation is to re-evaluate all loans. The company's operating costs have a significant impact on liquidity. We recommend performing an in-depth analysis of the company's operating costs in order to find a solution to reduce them and thus reduce the company's liquidity requirements

In conclusion, liquidity as an important element in the organization depends on many factors, but consistent management of receivables and liabilities and also time management can keep it at the required level necessary for the successful operation of the organization and ensure the financial stability of the company.

References

- Alex, J. (2005). *Financial and economic analysis*. Bratislava: IRIS, 121 p. ISBN 80-89018-90-4.
- Bernstein, L.A. & Wild, J.J. (1999). *Analysis of Financial Statement*. New York: *Irwin McGraw – Hill*, ISBN 0-07-094504-7
- Daniel, P. (2013). *Management and recovery of receivables*. Bratislava: Iura Edition, Spol, 472 p. ISBN ePub 978-80-8078-679-3.
- Farkaš, R. (2020). *Financial statement of trading companies*, Bratislava: *Wolters Kluwer*, ISBN 978-80-571-0247-2
- Fabus, M. (2015). Impact of foreign direct investment on unemployment development in selected regions of Slovak Republic. *Economic Annals XXI*, 19(155), 63-66. [http://soskin.info/userfiles/file/Economic-Annals-pdf/S155-0014\(14\)063.pdf](http://soskin.info/userfiles/file/Economic-Annals-pdf/S155-0014(14)063.pdf)
- Frintrup, M., Schmidhuber, L. & Hilgers, D. (2020). Towards accounting harmonization in Europe: a multinational survey among budget experts. *International Review of Administrative Sciences*, Article Number 0020852320915640 <http://doi.org/10.1177/0020852320915640>
- Gernon, H.M. & Meek, G.K. (2001). *Accounting – An International Perspective*. 5th ed. New York: *Irwin/McGraw-Hill*, ISBN-13: 978-0072316384
- Horváthová, J., Mokrišová, M. & Suhányiová, A. (2016). *Financial controlling for managers*. Prešov: Bookman, 218 p. ISBN 978-80-8165-151-9.
- Hellmann, A. & Patel, C. (2021). Translation of International Financial Reporting Standards and implications for judgments and decision-making. *Journal of Behavioral and Experimental Finance*, 30, Article Number 100479 <http://doi.org/10.1016/j.jbef.2021.100479>
- Henrique, Marcelo Rabelo; da Silva, Jessica Medeiros; Saporito, Antonio; et al. (2020). Tax accounting: bibliometric study of the accounting area between the period 2010 to 2020. *Revista Contabilidade E Controladoria-Rc C*, 12(3), 148-164.
- Hillebrandt, M. & Leino-Sandberg, P. (2021). Administrative and judicial oversight of trilogies. *Journal of European Public Policy*, 28(1), 53-71. <https://doi.org/10.1080/13501763.2020.1859598>

- Jakubec, M. & Kardoš, P. (2016). *Business value management*. Bratislava: Wolters Kluwer, 284 p. ISBN 978-80-8168-460-9.
- Jenčová, S. & Rákoš, J. (2010). *Financial and economic analysis and financial planning*. Prešov: Prešovská univerzita v Prešove, Faculty of Management, 286 p. ISBN 978-80-555-0186-4.
- Kainth, A. & Wahlstrom, RR. (2021). Do IFRS Promote Transparency? Evidence from the Bankruptcy Prediction of Privately Held Swedish and Norwegian Companies. *Journal of Risk and Financial Management*, 14(3), Article Number123
<http://doi.org/10.3390/jrfm14030123>
- Kajanová, J., Ölvecká, V. & Saxunová, D. (2014). *Evaluation of property and capital structure*. Praha: Wolters Kluwer, 88 p.
- Kajanová, J. (2014), *Analysis of the development of the tax system of the Slovak Republic after the accession to the European Union*
In: Slovakia - Plzeň: Aleš Čeněk, p. 64-78. ISBN 978-80-7380-520-3
- Kieso, D.E. & Weygandt, J.J. (2007). *Intermediate Accounting*. Hoboken, NJ : Wiley. ISBN 978-0-470-12 874-9
- Kotulič, R., Király, P. & Rajčániová, M. (2018). *Financial analysis of the company*. Third edition. Bratislava: Wolters Kluwer SR, 232 p. ISBN 978-80-8168-888-1.
- Lombardi, R., Schimperia, F., Smarra, M. & Sorrentino, M. (2020). Accounting For Infrastructure Assets in the Public Sector: The State of the Art in Academic Research and International Standards Setting. *Public Money & Management*, 41(3), 203-212.
<http://doi.org/10.1080/09540962.2020.1840761>
- Majduchová, H. & Neumannová, A. (2008). *Business management for managers*. Bratislava: Iura Edition. ISBN: 978-80-8078-200-9
- Majduchová, H. et al. (2020). *Business management*. Bratislava: Wolters Kluwer SR, 424 p. ISBN 978-80-571-0272-4.
- Mládek, R. (2005). *World accounting. IFRS. US-GAAP*. Praha: Linde, ISBN 80-7201-519-2
- Miah, MS., Jiang, HY., Rahman, A. & Stent, W. (2021). The impact of IFRS complexity on analyst forecast properties: The moderating role of high quality audit. *International Journal of Finance & Economics* <http://doi.org/10.1002/ijfe.2456> JAN 2021 Early Access
- Miah, MS. (2021). Does IFRS convergence bring improvement in firm performance? An empirical analysis. *Journal of Chinese Economic and Business Studies*, 19(1), 95-107. <http://doi.org/10.1080/14765284.2020.1846010>
- Natalizi, D. (2020). Public sector accounting contexts in the EPSAS change: a comparative study of Italy and Sweden. *International Review of Administrative Sciences* 0020852319894680 <http://doi.org/10.1177/0020852319894680>
- Oreský, M. & Rehák, R. (2019). *Financial and economic analysis of a business enterprise*. Bratislava: Wolters Kluwer, ISBN: 978-80-571-0174-1
- Pavic, I. (2020). Analysis of Changes in International Financial Reporting Standards and its Effects on Comparability and Consistency of Financial Statements. *Ekonomski Pregled*, 71(4), 331-357. <http://doi.org/10.32910/ep.71.4.2>
- Roca, F. (2021). *The influence of mandatory adoption of IFRS in Argentina on value relevance of accounting information*. *Journal of Applied Economics*, 24(1), 154-172. <http://doi.org/10.1080/15140326.2021.1900695>
- Riahi-Belkaoui, A. (2000). *Accounting Theory*, Business Press, ISBN 9781861525208
- Suhányiová, A. & Fabian, Š. (2010). *Double-entry bookkeeping of business entities in the theory and practice of an accountant and a financial manager*. Prešov: University of Prešov, in Prešov, Faculty of Management, 421 p. ISBN 978-80-555-0278-6.
- Savina, N., Pozniakovska, N. & Miklukha, O. (2021). Conceptual Framework For Financial Reporting: Integrated Policy. *Financial and Credit Activity-Problems of Theory and Practice*. 1(36), 76-83. ISSN 2306-4994, ISSN 2310-8770 WOS:000645131200008

- Sacer, I.M., & Zyznarska-Dworczak, B. (2020). Assets Measurement Principles According to Croatian and Polish Accounting Standards. *Croatian Economic Survey*, 22(1), 41-64 <http://doi.org/10.15179/ces.22.1.2>
- Silva, A., Jorge, S. & Rodrigues, LL. (2021a). Enforcement and accounting quality in the context of IFRS: is there a gap in the literature? *International Journal of Accounting and Information Management* <http://doi.org/10.1108/IJAIM-08-2020-0126> JAN 2021 Early Access
- Silva, AP., Fontes, A. & Martins, A. (2021b). Longitudinal Perceptions of Enforcement Mechanisms in an Ifrs-Based Accounting Reform. *Polish Journal of Management Studies*, 23(2), 495-511 <http://doi.org/10.17512/pjms.2021.23.2.30>
- Stewart, E., & Connolly, C. (2021). Recent UK Central Government Accounting Reforms: Claimed Benefits and Experienced Outcomes. *ABACUS. A Journal of Accounting Finance and Business Studies*, 57(3), 557-592. <http://doi.org/10.1111/abac.12222>
- Suhányiová, A., Korečko, J. & Mokrišová, M. (2016). *Postupy v podvojnom účtovníctve podnikateľov (Procedures in double-entry accounting of entrepreneurs)*. Prešov: Bookman, 223 p. ISBN 978-80-8165-215-8.
- Suhányiová, A. (2009). *Analytical view of accounting as a source of information in management*. Prešov: University of Prešov, in Prešov, Faculty of Management, 192 p. ISBN 978-80-8068-956-8.
- Suhányiová, A. (2011). *Introduction to double entry accounting for financial managers*. Prešov: University of Prešov, in Prešov, Faculty of Management, 153 p. ISBN 978-80-555-0333-2.
- Šlosárová, A. & Blahušíaková, M. (2020). *Analysis of financial statements*. Bratislava: Wolters Kluwer SR, 440 p. ISBN 978-80-571-0166-6.
- Štangová, N. & Hajduchová, E. (2010). *Accounting*. Bratislava, 198 p. ISBN978-80-970495-5-3.
- Štangová, N., Vígiová, A. Hajduchová, E. (2012). *Accounting in the context of public administration and small and medium - sized enterprises. Trenčín: Inštitút aplikovaného manažmentu*, 439 p. ISBN 978-80-970802-9-7.
- Šuranová, Z. & Škoda, M. (2007). *International accounting. Banská Bystrica: Faculty of Economics UMB*, ISBN 978-80-8083-4388
- Tawiah, V. & Gyapong, E. (2021). International financial reporting standards, domestic debt finance and institutional quality: Evidence from developing countries. *International Journal of Finance & Economics* <http://doi.org/10.1002/ijfe.2575> MAY 2021 Early Access
- Tumpach, M. (2006). *International Standards for the Preparation of Financial Statements, IFSR/IAS. Bratislava: Iura Edition*, ISBN 80-8078-072-2
- Vlachynský, K. et al. (2009). *Corporate Finance*. Bratislava: Iura Edition, 524 p. ISBN 978-80-8078-258-0.
- Wijekoon, N., Samkin, G. & Sharma, U. (2021). International financial reporting standards for small and medium-sized entities: a new institutional sociology perspective. *Meditari Accountancy Research* <http://doi.org/10.1108/MEDAR-06-2020-0929> JUN 2102 Early Access
- Zalai, K. (2016). *Financial and economic analysis of the company. Bratislava: Sprint*. ISBN 978-80-89710-22-5

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INTERNATIONAL FINANCIAL REPORTING STANDARDS' (IFRS) APPLICATION PECULIARITIES: A CASE STUDY

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Abstract. This article raises the topical issue of the main aspects of International Financial Reporting Standards (IFRS) 5 "Non-current assets held for sale" and their more logical and structured explanation according to the standard for a more accessible understanding by all stakeholders of this standard, including students, since at the moment IFRS 5 little known and rather difficult to understand. The authors describe the processes of recognition and evaluation of non-current assets held for sale, using the financial statements of the largest Russian company as an example. A brief overview of the effectiveness of its activities is given, indicating the importance of the occupied market share and the representativeness of the results obtained. The write-off procedure for the asset held for sale is presented under this heading, taking into account the particulars of the depreciation process for the assets in question. The study showed that normally a sale of an asset must take place within one year, but this may not always be the case, which is reflected in this article. The conclusion presented results and recommendations which, on the one hand, improve the reliability of the company's financial statement, on the other hand, facilitate the understanding of the accounting area for interested users.

Keywords: cultural approach; non-current assets; recognition; disposal; simplification

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JEL Classifications: E42, E52, G38

1. Introduction

International Financial Reporting Standards (hereinafter IFRS) are known to provide a universal and understandable framework for interaction between the reporting company and the users of this information. Importantly, international standards do not constitute national accounting standards; they, therefore, do not have the characteristics and leverage of local jurisdictions. National accounting standards, in turn, take into account the specificities of a country's economy and, to a greater extent, the interests of regulators and regulators (Morozova & Lehoux. 2019). As a result, there may be differences in the disclosure of elements of financial reporting. Unlike

national accounting standards, IFRS focus on providing reliable financial information that can be useful to external users, particularly investors and creditors, for economic decisions regarding investments (Chen, 2017). A significant benefit in bringing together national and international users of financial information is the ability to apply IFRS to the global agglomeration voluntarily unless the law of jurisdiction provides otherwise (Mages, 2007). The problem of accounting and valuation of non-current assets held for sale is very relevant since this issue is not very widely covered, and also because of the difficulty of people understanding the recognition and disposal of such specific types of assets (Zypel & Young 2012). Moreover, the Ministry of Finance of Russia made changes in the legislation for non-current assets held for sale in 2019, so, now, Russian rules are very close to IFRS 5. To increase awareness and understanding IFRS 5 the authors will consider all necessary steps of recognition, assessment, and disposal on the example of PIK Group, which will ease in understanding all processes. We will try to construct some recommendations about a reflection of non-current assets in the financial statements of PIK Group and other companies.

2. Literature review

Long-term assets held for sale were discussed in several articles. Druzhilovskaya (2015) studies present the following definition of non-current assets held for sale: "Non-current assets held for sale are expected to be realized within 12 months after the reporting date and they are held for trading". This article also raises the issue of accounting for these types of assets in Russian accounting in comparison with IFRS standards, since at the time this article was written (2015), there was no proper accounting for long-term assets held for sale in Russia. Another researcher Ignatova (2008) uses in her article the definitions of long-term assets held for sale exactly following the standards for a more accurate understanding of the differences between the two systems: Russian and international. International standard IFRS 5 classifies non-current assets as held for sale, if their carrying amount will be recovered primarily through sale, and not through continuing use. Now, from April 5, 2019, the Ministry of Finance of Russia made changes to clause 10.1 of PBU 16/02 "Information on discontinued operations", which came into force on January 1, 2020, which recognize long-term assets for sale as "an item of fixed assets or other non-current assets (except financial investments), the use of which was discontinued due to the adoption of a decision to sell it and there is a confirmation that the resumption of use of this object is not expected (an appropriate decision was made by the management, actions were started to prepare the asset for sale, an agreement was concluded)".

Non-current assets for sale are also considered to be tangible assets held for sale that remain from the disposal, including partial, non-current assets or recoverable in the course of their current maintenance, repair, modernization, reconstruction, except for the case when such values are classified as inventory. All these definitions have the same meaning, so it is difficult to disagree with them (Zeghal et al., 2011; Kim & Shi, 2012; Kager, & Niemann, 2013; Leventis et al., 2011; Mohammadrezaei et al., 2016). Current research is directed, first of all, to increase the awareness of this subject, to conduct a multilateral analysis of IFRS 5, which is the main document for assessing such a special type of assets as non-current assets held for sale, based on this analysis, consider the recognition and disposal of long-term assets held for sale by example PIK Group, as well as possible ways to improve the recognition of these assets. The main goals of the article are presented below:

- a) To study the theoretical basis for accounting for non-current assets held for sale, which is the IFRS 5 standard.
- b) Based on IFRS 5 and financial statements of the PIK Group, to analyze the recognition and disposal of long-term assets held for sale in the company's statements.
- c) Assess and make recommendations for the recognition and disclosure of information in the financial statements of the PIK Group on the recognition and disposal of long-term assets held for sale.

Usually, we use non-current assets for production purposes, but there are some exceptions. These exceptions can be seen in IFRS 5, where non-current assets, which held for sale are described. Hence, this standard tells us the rules for recognizing non-current assets held for sale in firms, as well as the right to dispose of such assets from

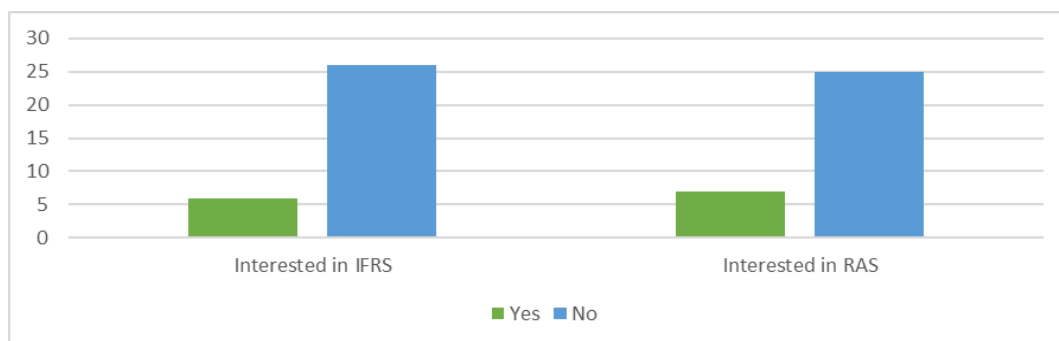
the company's statement of financial position. According to IFRS 5, a company needs to classify non-current assets as assets for sale if their carrying amount will be compensated primarily through the sale and not through the continued use of this non-current asset (Abdallah et al., 2018; Di Fabio, 2018). However, there are a few exceptions that should never be considered non-current assets held for sale:

- 1) deferred tax assets (IAS 12 Income Tax);
- 2) assets arising from employee benefits (IAS 19 Employee Benefits);
- 3) financial assets within the framework of IFRS 9 "Financial Instruments";
- 4) non-current assets that are accounted following the fair accounting model - the value specified in IAS 40 Investment Property;
- 5) non-current assets measured at fair value fewer costs to selling following IAS 41 Agriculture;
- 6) rights arising from insurance contracts as defined in IFRS 4 Insurance of Contracts.

For a better understanding of all processes of recognition, assessment, and disposal of non-current assets, held for sale, we will use information about PIK Group and its financial statements. But initially, we made some quick reviews of this company to understand its current position and the feasibility of the study. The PIK Group of Companies is the largest developer in Moscow and the Moscow Region, which began its history in 1994. The group of companies specializes in the construction of comfort class apartments and is also engaged in the design of real estate objects, produces building materials, building structures, mainly for further use in its construction. We can say that there is a vertical integration of companies to reduce the cost of real estate construction. The company has been on the stock market since 2007. In addition, the company is on the list of system-forming enterprises in Russia by the decision of the Government of the Russian Federation.

3. Methods

For better analysis and understanding of the relevance of this topic, a survey among students of the Plekhanov Russian University of Economics was conducted. This survey consisted of 5 questions covering this topic. So, according to the study, about 19% of respondents answered that they were interested in the topic of studying IFRS, while studying Russian Accounting Standards (RAS) was interested in about 21% of respondents. The data show that at the moment approximately the same number of students is interested in studying two different systems, which may be a consequence of the merger of the two systems together to facilitate the process of creating and using the financial statements of companies from different countries by stakeholders, which will improve and increase the movement of capital between countries, developing the economies of countries and the



the world as a whole (see Fig. 1).

Fig. 1. Results of a survey of students' interest in IFRS and RAS

The following questions dealt directly with IFRS 5 "Non-current assets held for sale". A question was asked as to whether the students were familiar with this standard. The result showed that only 19% of respondents have heard about this standard, not a single student has read this standard, and 81% have never heard or know anything about it. Not so good statistics, which confirms my words about the non-prevalence of this standard.

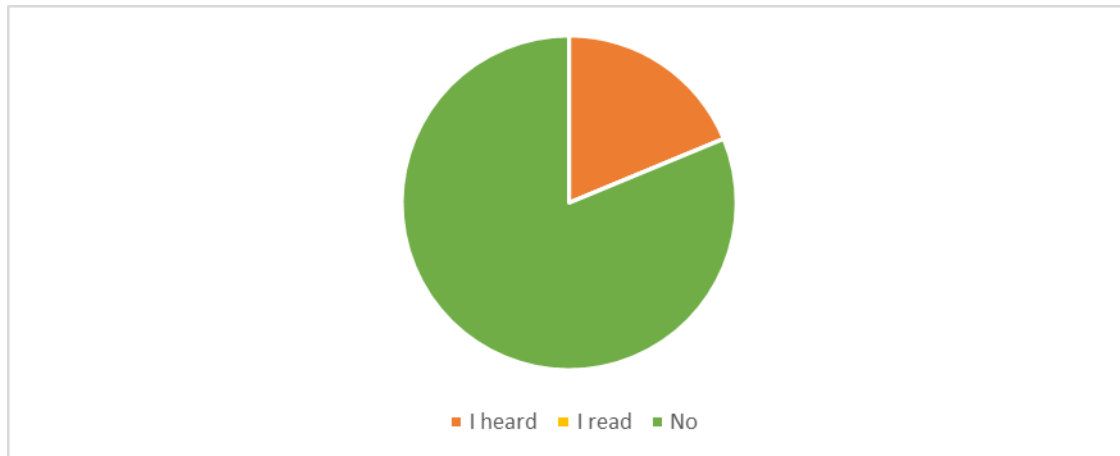


Fig. 2. Results of a survey of students' knowledge of IFRS 5

An equally important question, and perhaps the most important for this article, looks like this: "Do you understand this IFRS?" Unfortunately, the results of this question are not satisfying. Only 9% of respondents answered that they understand this standard, while 91%, although they know about it, do not understand it. Thanks to this question, we can accurately assert the need to write this article, as well as its further distribution. The final question concerns the students' interest in studying this standard in a simplified format to better understand this issue. 30% of respondents expressed a desire to study this issue, while 70% of respondents did not show interest, but even 30% is already a fairly significant result (Fig. 2). We hope that this article, using the example of the analysis of the standard for the PIK Group, will help to better and more accurately understand the data of the rather complex IFRS 5. For the deepest understanding of this problem, it is necessary to study the materials that reveal the basic concepts of this issue.

4. Results

Speaking of quantitative indicators, the company has increased the total commissioning of housing (Fig. 3), starting from 2015 by 203% percent and at the moment is the largest developer in Russia. Also, we can observe the positive tendencies in both directions: in the volume of market entry by PIK flats and it's purchases from 2015 to 2018 and decrease by 26% and 5% consistently in 2019. It can be probably explained by introduction of law about escrow accounts.

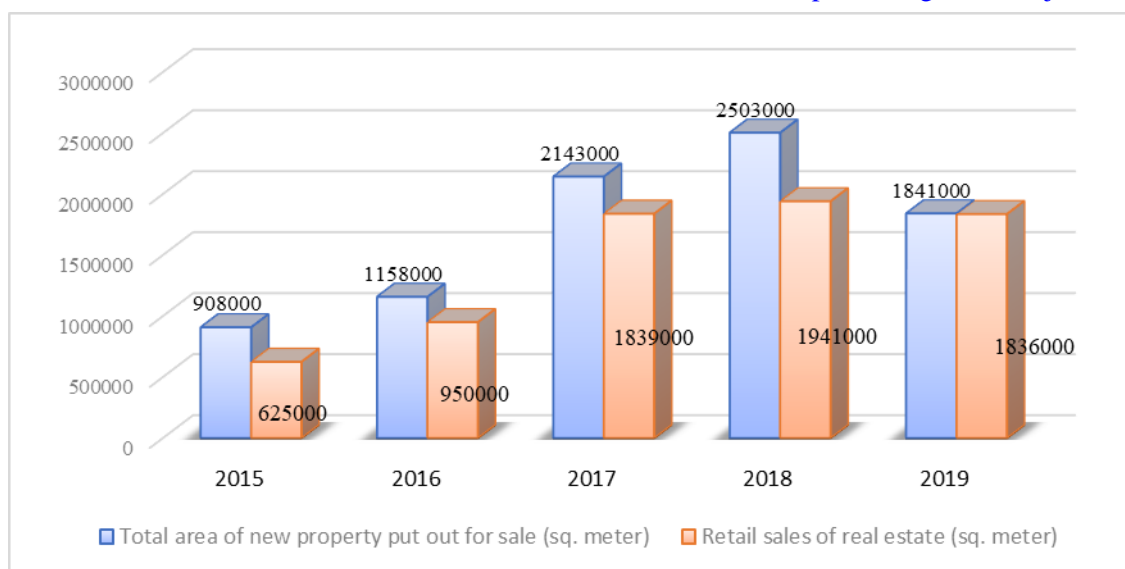


Fig. 3. Comparison of the volume of real estate of the PIK group of companies (the volume of market entry and sales of housing in square meters) Financial Statements of PIK Group from 2015 to 2019

Source: https://www.investing.com/equities/pik_rts-ratios

But despite the fact that the company has decreased the entrance of new houses in 2019, if we will talk about the sales of new apartments, we can see the constant growth from the sales starting from 2015 to 2019 by 407% and by 6,3% from 2019 to 2018, that you can see in Fig. 4. Talking about the comparison of average industry 5 years growth and the company's growth: we can observe a huge gap between these two values: the average industry growth is equal to 9,37% increase of sales of real estate, while PIK shows the increase of 293% in comparison with 2015.

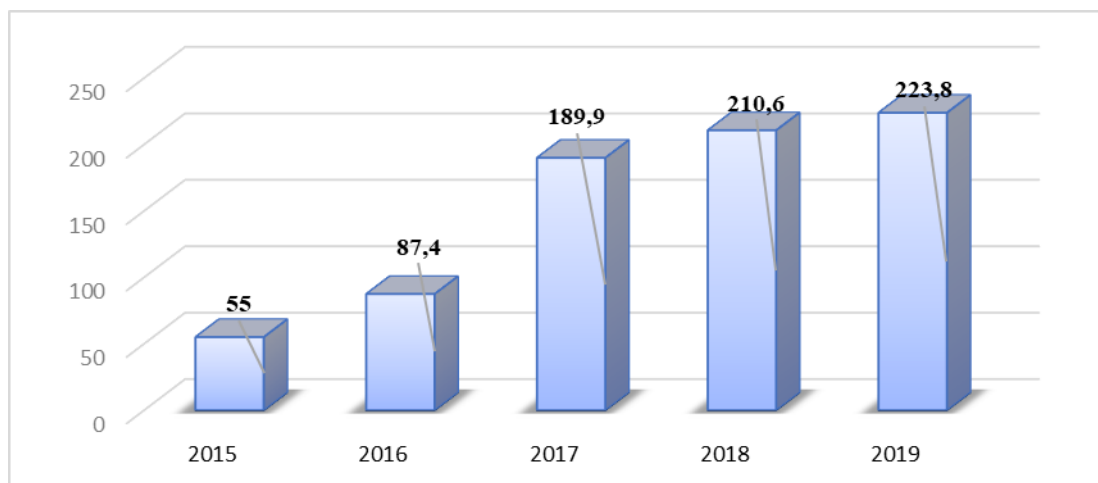


Fig. 4. Real estate sales (billion rubles) Financial Statements of PIK Group from 2015 to 2019

Source: https://www.investing.com/equities/pik_rts-ratios

The fiscal year 2019 ended for the PIK with revenue of 280635 million rubles compared to 245557 million rubles, which were indicated in the 2018 financial statements. This increase is due to the growth of sales of real estate and the increase of revenue from proceeds from other sales by practically 500%. In fiscal 2019, PIK recorded a

net profit of 45113 million rubles in comparison with a year-ago profit of 26893 million rubles. It increased by 167,75%.

Key company figures in 2019:

- 1) Total area of new property put out for sale (sq. meter) - 1841000 (↑202% from 2015)
- 2) Real estate sales (billion rubles) - 223,8 (↑407% from 2015)
- 3) Revenue 280635 mln RUB (↑549%) and Net profit 45113 mln RUB (↑394%)
- 4) Share price of the company increased by 183% from 219 Rub in 2015 to 400 Rub in 2019 (↑183%)

Talking about some main indicators for company, such as ROA, ROE, it shows very good results and it is higher than the industry average. Current ratio, which is also vital for company, is equal to 1,85 that means that company can easily pay it's short-term debts because it is higher that industry average and higher than optimal value 1,5 (Table 1).

Table 1. Indicators for PIK Group in 2019

	PIK Group	Industry average
ROE	40,9%	32,31%
ROA	9,56%	7,88%
Current ratio	1,85	1,64

Therefore, as a result of our analysis, it can be pointed out that PIK Group has a rather stable position with great potential. To realize non-current assets held for sale, we also need to estimate this or recognize it in the financial statements. An entity shall measure a non-current asset classified as held for sale at the lower of its carrying amount and fair value fewer costs to sell (net realizable value).

Net realizable value (NRV) is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs required to sell. Immediately prior to the initial classification of an asset as held for sale, the carrying amount of the asset (or all assets and liabilities in a group) must be measured in accordance with applicable IFRSs. If a newly acquired asset meets the criteria for being classified as held for sale, this would result in the asset being measured on initial recognition at the lower of its carrying amount if it had not been classified, thus (eg cost price) and fair value fewer costs to selling.

Therefore, if an asset is acquired in a business combination, it must be measured at fair value with fewer costs to sell. If the sale is expected to occur after more than one year, the entity shall measure the cost to sell at its present value. Increases in the present value of costs to sell arising overtime should be presented in profit or loss as finance costs. However, during the same period, the value of non-current assets for sale may change, so the firm needs to recalculate it:

- 1) a company must recognize an impairment loss on the initial or subsequent write-down of an asset to fair value less costs to sell (Florou & Kosi, 2015; Tsilikova et al., 2020);
- 2) a company shall recognize a gain on subsequent increases in the fair value of the asset less costs to sell, but not in excess of any accumulated impairment loss that was recognized either in accordance with this IFRS or previously in accordance with IAS 36 Impairment of Assets (Ponomareva et al., 2020; Belyakova & Zvereva et al., 2020a, 2020b).
- 3) any gain or loss not recognized at the date of sale of the non-current asset should be recognized at the date of derecognition (Hirsch, 2007; Zvereva et al., 2020a 2020b).

A company shall not depreciate a non-current asset when it is classified as held for sale or when it is part of a disposal group that is classified as held for sale. So, considering the financial statements of the Group, we can distinguish the following points related to the entry of long-term assets that were accounted for as held for sale.

However, in order to recognize an asset as held for sale in its accounting, it is necessary to take into account several points.

1. The company plans to obtain value from this asset not through use, but sale. In the reporting of the PIK group of companies, it is indicated that these companies were purchased not for the purpose of use, but for the purpose of further resale.
2. The company is actively looking for buyers, and the likelihood of a sale is assessed as high.
3. The sale must take place within 1 year (with some exceptions described in theory). Also, in the PIK reporting, you can see that the PIK group of companies acquired these companies in the second half of 2019, and sold them already in December of the same year, that is, these companies were on the balance sheet for less than a year, which corresponds to the conditions for recognizing an asset as held for sale.
4. The company must indicate at what value the asset will be valued: at the lower of two values: carrying amount or fair value minus costs for sale. The PIK group of companies in its financial statements uses the method of valuation of a long-term asset held for sale at fair value fewer costs to sell (Net realizable value), which were determined and known at the time (date) of acquisition. Sometimes a company may decide not to sell an asset, so that asset is no longer recognized as held for sale.

If an entity has classified an asset as held for sale, but the criteria in this IFRS are no longer met (in terms of a plan, active sale, its adequate cost, etc.), then the entity should discontinue the classification of the asset. as put up for sale.

In case of refusal to classify the asset NC as for sale, the company must evaluate it at the minimum value:

- 1) its carrying amount before the asset was classified as held for sale, adjusted for the depreciation or revaluation amounts that would have been recognized if the asset had not been classified as held for sale
- 2) its recoverable amount at the date of the subsequent decision not to sell or distribute

If the sale is expected to occur after more than one year, the entity shall measure the cost to sell at its present value. Increases in the present value of costs to sell arising over time should be presented in profit or loss as finance costs. Any gain or loss not recognized at the date of sale of the non-current asset should be recognized at the date of derecognition.

Thus, considering the financial statements of the Group, we can distinguish the following points related to the disposal of non-current assets that were accounted for as held for sale. In the case of the PIK Group of Companies, the company decides not to re-qualify the asset from held for sale into an ordinary asset, but to complete the process for which it was acquired - to sell it. We know from the Group's 2019 financial statements that the company acquired 17 companies in December 2019 for the special purpose of resale. Therefore, already in December 2019, the Group sold the assets and wrote them off at the value at which they were valued: Net Relisable Value. Nevertheless, in order to write off an asset held for sale from your account, you need to consider several points:

1. The asset must have already been measured and recognized as held for sale in the company's statement of financial position or in the notes. As can be seen in the consolidated report of the PIK Group of Companies for 2019, the Assets held for sale were reflected in Note number 8 "Acquisition of subsidiaries, associates and repurchase of non-controlling interests", specifically in paragraph 8.a "Acquisitions of subsidiaries in 2019". This part described the steps for recognizing these assets as held for sale, as well as the method of measuring its value as the difference between fair value and costs of its sale, which, as indicated in the statements, were known at the date of the acquisition of the companies, was also reflected the effect of the purchase of subsidiaries in the form of a table for 2019, which includes information on assets held for sale.

2. It is necessary to conclude an agreement with the company or companies that were found as a result of active actions of the company holding the asset to find buyers, on the sale of these assets. The PIK Group of Companies reports that 17 companies held for sale were sold in December 2019, i.e., a sale was made.
3. As a result of the sale of companies, it is necessary to write off these assets from the company's balance sheet.

This information can also be found in the 2019 PIK Group Consolidated Statements in Note 9 Disposal of Subsidiaries, where a table is presented showing all assets and liabilities that were sold as a result of the sale of subsidiaries, as well as the disposal of assets held for sale by a separate string.

Also looking at the Group's financial statements from 2015 to 2019, we can observe the process of recognition and disposal of long-term assets that were acquired specifically for sale only in 2019. Therefore, we will only work with the financial statements of 2019. In the second half of 2019, PIK Group, together with its controlling shareholder, entered into several joint agreements with a third party to purchase a company that provides maintenance and management of apartment buildings ("PIK Comfort").

As a result of this transaction, 99.9% of the shares in the head office and subsidiaries of this business came under the control of PIK Group. An additional part of the transaction was an agreement for the purchase and subsequent sale of 17 companies operating in the housing and utilities sector in December 2019. These 17 companies were acquired solely for further resale and were included in the financial statements as assets held for sale. The total acquisition cost of all assets and companies, as a result, amounted to RR 3,779 million. The payment was divided into two parts: a part in the form of RUB 2,006 million was paid using cash, the remaining part in the amount of RUB 1 million 773 thousand was paid using the existing receivables of PIK Group, which arose as a result of the withdrawal of some of the companies from the capital of the Group in 2017, which in 2019 again became part of the PIK Group.

5. Discussion

It should be noted that PIK-Comfort is the largest company that manages housing and communal services throughout Russia. The company currently serves 50,000,000 square meters of housing owned by 3,000,000 residents in 18 regions of Russia. The company also strives to make life easier for residents in all areas: from complete turnkey renovations to home insurance. The company is actively digitalizing its services, introduced its own application that makes it easier to communicate with residents, as well as simplifies quality control of the services provided. Initially, this company belonged to the PIK Group of Companies, but in 2017 it left the capital (Leventis, 2011; Egorova, 2020). However, at the end of 2019, as indicated above, the company was again acquired by the PIK Group of Companies. In general, from the date of acquisition of the companies to the end of 2019, there was an increase in revenue and profit of PIK by RUB 10,882 million and RUB 951 million, which was the result of a business combination agreement.

However, considering an alternative situation where the transaction would have taken place on 1 January 2019, the Group's management estimates the possible increase in revenue and profit from the business merger would be RR 19 893 million and RR 1,386 million, respectively. This estimate assumes that all value adjustments made on the actual date of purchase would have been made on January 1, 2019. To better understand the process, let's look at a table showing the effect of buying subsidiaries (Table 2).

Table 2. Effect of purchase of subsidiaries for PIK group

Mln rubles	Total	Operation of apartment buildings	Service for renting apartments
Non-current assets	739	738	1
Intangible assets	11124	10 742	382
Deferred tax assets	318	318	-
Inventories	194	188	6
Other investments	178	178	-
Accounts receivable	11859	11806	53
Cash and cash equivalents	899	721	178
Assets held for sale	2911	2911	-
Deferred tax liabilities	(2093)	(2029)	(64)
Loans and borrowings	(2822)	(2822)	-
Accounts payable	(13893)	(13880)	(13)
Provisions	(285)	(285)	-
Net identifiable assets, liabilities and contingent liabilities	9129	8586	543
Income from bargain acquisitions of subsidiaries	(4719)	(4719)	-
Non-controlling interest	(271)	(88)	(183)
Total amount of remuneration	4139	3779	360
Offset with receivables; investments in past periods	1803	1773	30
Remuneration paid	2336	2006	330
Cash purchased	(899)	(721)	(178)
Acquisitions of subsidiaries less purchased funds	1437	1285	152

Source: prepared by the authors

RBC Novosti (2017) <https://www.rbc.ru/rbcfreenews/594240b69a794714674276d3>

In this table, the effect of the acquisition is divided into 2 parts: 1 part shows the effect of the purchase of companies engaged in servicing apartment buildings, and part 2 shows the result of the acquisition of companies that provide housing rental services. The main income and expenses can be observed in column 1, showing the result of the purchase of companies that operate houses. It is in this part that you can also notice the assets that are intended for sale (Mohammadrezaei, 2015; Zvenov, 2018; Rahman and Bobkova, 2017). For the purchase of these subsidiaries, the PIK Group of Companies paid 4139 million rubles in two ways: since these companies were already part of the PIK Group of Companies, they had obligations to the PIK Group, and now PIK has offset this debt of 1803 million rubles and wrote off to the payment of companies, and payments for subsidiaries were made in the form of a transfer of funds in the amount of 2,336 million rubles. Thus, the PIK Group of Companies received income from the purchase of subsidiaries in the amount of RUB 4,719 million (Voronova et al., 2020).

The acquired companies included 17 companies that PIK Group initially wanted to sell. These companies were measured at their fair values at the time of the acquisition of the companies (i.e. the selling prices of the companies minus the costs to sell them, which PIK knew at the time of acquisition) and are presented in the table as assets held for sale in the amount of RUB 2,911 million. Since these companies were intended for sale, the company had to actively seek a buyer in order to sell these assets in less than a year. These companies were acquired in December 2019 and, as a result of December 31, 2019, they were already written off from the company's accounts as assets held for sale, and the company received income from the sale of these subsidiaries in the amount of RUB 2,911 million as previously calculated.

Conclusions

Ultimately, however, after considering the theoretical aspects of IFRS 5 on assets that are intended for sale, as well as the recognition and disposal of such assets using the example of the PIK Group of Companies, the following conclusions can be drawn:

1. Since the company follows IFRS reporting standards in the preparation and accounting of the company's financial position, this international format allows the company to reach a higher level than just the Russian market, which the company did earlier, having issued its shares on the London Stock Exchange in 2007, attracting at that time, \$ 1.93 billion by issuing 77.2 million shares, 50.1 million of which was a placement of GDRs. Raising about \$ 2 billion amounted to about 16% of the company's total capital. The initial public offering of PIK Group shares on the Moscow Exchange took place in June 2013. At that time, the company issued 167.2 million securities, which made it possible to attract about 10.45 billion rubles. Based on this, it was possible to estimate the company's market capitalization for 2017, which amounted to about 202.4 billion rubles. However, in 2017, the company decided to leave the London Stock Exchange due to the consistently low trading volumes on this exchange, while the difference between the prices of GDRs on the London and ordinary shares of the firm on the Moscow stock exchanges was significant. The PIK Group of Companies also took into account the fact that the main shareholders are people who invest in the company's shares on the Moscow Exchange, that is, the company considered it irrational to pay additional commissions to maintain a listing on the London Stock Exchange.
2. Since in IFRS 5, which describes assets held for sale, there is no exact indication of where these assets should be reflected, there are only recommendations on this issue: either reflect in the statement of financial position of the company, or in notes, the company in question can reflect the data assets in the place where it will be more convenient for her. Thus, the PIK Group of Companies discloses information on assets that are intended for sale in notes, together with the reflection of information on the purchase of subsidiaries: note 8. Acquisition of subsidiaries, associates and redemption of non-controlling interests (a) Acquisitions of subsidiaries in 2019 – «Acquisition of companies providing maintenance and management of apartment buildings».
3. Disposals of assets held for sale should also be reflected in the company's financial statements. This item can also be found in the PIK Group's Consolidated Financial Statements for 2019 in the Notes in section 9. "Disposal of Subsidiaries". This note contains very brief information about the disposal of subsidiaries: about assets and liabilities, as well as gains or losses from the sale of these companies, as well as a separate line discloses information about the disposal of assets held for sale. Based on the above, I would like to write the following recommendations regarding the reflection of assets held for sale in the statements of PIK Group.

The first recommendation relates rather to the rules for the recognition of assets held for sale in accordance with IFRS in the financial statements of the company. Since this standard (IFRS 5) does not specify the exact place where it is possible to find assets held for sale, this makes it difficult to search in the statements and work with these assets. This can be especially difficult for people who are not familiar with all IFRS standards literally. Therefore, it would be more convenient to indicate a more precise position for this type of asset. Using the financial statements of PIK Group as an example, information on assets held for sale is reflected in the notes on the acquisition and disposal of subsidiaries, which is quite logical and convenient.

In PIK's notes on the acquisition of subsidiaries, we may find information about assets held for sale, but this information is mentioned in the general context of acquisitions of other companies, which makes it difficult to understand the recognition of assets held for sale. Based on the rules for recognizing this type of assets under IFRS 5, we would recommend separating information about assets held for sale in a separate paragraph or even a separate note and gradually and in a structured way describe the information about them, which is required under IFRS 5. For example, we would like to see information in the company's financial statements about the date of purchase of these assets, the time during which the asset is projected to be sold, the plan for sale, which should be in accordance with IFRS 5.

Concerning disposal of assets held for sale, we would also like to see more information in the Company Notes. At the moment, in the company's reporting, you can see only one line about the disposal of assets held for sale. It would be more informative if the company added to its reporting information about the estimated costs of selling the company, which at the moment says only: "costs of selling, information about which was known at the date of acquisition", which is not enough. The company could also add information about the date of sale of these assets and the party to whom they were sold. Since it is not possible to find this information in other sources (on the PIK Group website, news pages of newspapers, open sources of the Internet), if it is not confidential information.

Today it is very important to have and apply certain standards, especially for the formation of the company's financial statements. Nowadays, more and more countries and companies in the world are striving to use a single standard to facilitate understanding and accounting of the activities of firms in the world. For example, in Russia from January 1, 2020, amendments entered into clause 10.1 of PBU 16/02 "Information on discontinued operations", which bring Russian accounting standards to IFRS 5 on the definition, recognition and disposal of non-current assets held for sale. In turn, some Russian companies keep their accounts either according to two standards: PBU and IFRS, or, like the PIK Group of Companies, apply IFRS standards in the preparation of their financial statements. As this article was written, standards for the recognition and disposal of non-current assets held for sale were developed and presented. Brief information about the PIK Group of Companies was presented. Also, an assessment was made of the economic situation of the PIK Group. Based on these calculations, conclusions were drawn about a fairly good financial position of the company, but with a significant drawdown in 2017. Recognition and disposal of PIK's long-term assets based on its financial statements were reviewed and recommendations were presented as a result.

In our recommendations for the reflection of long-term assets held for sale by the PIK group, it was proposed to add the necessary information to the financial statements of the company, in particular to the Notes, since these assets are reflected there, since, based on IFRS 5 standards, the company needs to take into account the period of sale of the asset, actions to find a buyer, plan of sale, date of sale, etc. While the Notes of the PIK Group do not contain all the information for a better understanding of the users of these statements and potential investors. Thus, having considered the main points of IFRS 5 using the example of long-term assets held for sale by PIK Group in 2019, the main provisions of this standard were structured and simplified to better understand and simplify it for stakeholders, including students.

References

- Abdallah, A.A.N., Abdallah, W., & Salama, F.M. (2018). The Market Reaction to the Adoption of IFRS in the European Insurance Industry. *Jeneva Papers on Risk and Insurance – Issues and Practice*, 43, pp. 653–703.
- Belyakova, M.Y., & Zvereva, A.O. (2020). *Research of the use of on-line platforms by commercial companies of the Russian Federation*. Proceedings of the 35th International Business Information Management Association Conference, Education Excellence and Innovation Management: A 2025 Vision to Sustain Economic Development during Global Challenges (IBIMA). pp. 3376–3382. Seville, Spain: 1-2 April, 2020.
- Chen, E., Gavius, I., & Lev, B. (2017). The positive externalities of IFRS R&D capitalization: enhanced voluntary disclosure. *Review of Accounting Studies*, 22, pp. 677–714.
- Druzhilovskaya E.S. (2015). Long-term assets held for sale and their valuation in Russian and international accounting. *International accounting*, 42 pp. 21–3Di Fabio, C. (2018). Voluntary application of IFRS by unlisted companies: evidence from the Italian context. *International Journal of Disclosure and Governance*, 15, pp. 73–86.
- Florou, A., & Kosi, U. (2015). Does mandatory IFRS adoption facilitate debt financing? *Review of Accounting Studies*. 20, pp. 1407–1456.
- Hirsch, B. (2007). Controlling und IFRS-Rechnungslegung: Konzepte, Schnittstellen, *Zeitschrift für Controlling & Management*, 51, pp. 68–69.
- Ignatova N. V. (2008). Non-current assets for sale and discontinued operations: a comparison of the requirements of IFRS 5 and PBU 16/02. *Everything for an accountant: Towards international standards*, 21(1). pp. 12–16

- Kager, R., & Niemann, R. (2013). Income determination for corporate tax purposes using IFRS as a starting point: evidence for listed companies within Austria, Germany, and The Netherlands. *Journal of Business Economics*, 83, pp. 437–470.
- Kim, J.B., Shi, H. (2012). IFRS reporting, firm-specific information flows, and institutional environments: international evidence. *Review of Accounting Studies*, 17, pp. 474–517.
- Leventis, S., Dimitropoulos, P.E., & Anandarajan, A. (2011). Loan Loss Provisions, Earnings Management and Capital Management under IFRS: The Case of EU Commercial Banks. *Journal of Financial Services Research*, 40, pp. 103–122.
- Mages, M.K. (2007). Wolfgang Ballwieser IFRS-Rechnungslegung: Konzept, Regeln und Wirkungen. *Zeitschrift für Controlling & Management*, 51, pp. 222–230.
- Mohammadrezaei, F., Mohd-Saleh, N., & Banimahd, B. (2015). The effects of mandatory IFRS adoption: A review of evidence based on accounting standard setting criteria. *International Journal of Disclosure and Governance*, 12, pp. 29–77.
- Morozova, T., & Lehoux, L. (2019). Practical Aspects of Useful Life Calculation for Fixed Assets in IFRS Reports. Proceedings of the 34th IBIMA 2019, Vision 2025: Education Excellence and Management of Innovations Through Sustainable Economic Competitive Advantage. pp. 4722–4729. Madrid, SPAIN: NOV 13–14.
- Ponomareva N., Golubtsova, E., & Pakshaeva, A. (2020). The prospects of the Russian personal income tax reform in research proceeding by scientists of foreign universities. 6th International Conference on Advances in Education (ADVED 2020), pp. 162–169. Turkey: 5–6 October 2020
- RBC Novosti, 2017. PIK Group completed delisting from the London Stock Exchange <https://www.rbc.ru/rbcfreenews/594240b69a794714674276d3> (date of access 03.12.2020)
- Tsilikova, M.S., Golubtsova, E.V., & Scherbakova, T.S. (2020). The impact of the tax burden on the economic growth of BRICS countries. Proceedings of the 35th International Business Information Management Association Conference, Education Excellence and Innovation Management: A 2025 Vision to Sustain Economic Development during Global Challenges (IBIMA). pp. 2990–2998. Seville, Spain: 1–2 April.
- Voronova, T. A., Golubtsova, E., V., Maksimov, D. A., Novikova, E. S., & Ponomareva, N., V. (2020). The Role of Taxation in the Competitiveness of Russian Education Following Globalization and Digitalization Processes in the World Economy. *Turismo: Estudos & Práticas*, 2, pp. 1–7
- Zvereva, A., Akhmadeev, R., Morozova, T., Bykanova, O., & Avvakumova, I. (2020a). Improving access to environmental information for the subjects of tax relations. International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management (SGEM 2020), pp. 279–284. Bulgaria: August (5.2)
- Zeghal, D., Chtourou, S., & Sellami, Y.M. (2011). An analysis of the effect of mandatory adoption of IAS/IFRS on earnings management. *Journal of International Accounting, Auditing and Taxation*, 20 (2) pp. 61–72.
- Zvereva, A.O., Golubtsova, E.V., & Tsilikova, M.S. (2020b). The specifics of the use of tax instruments in the digital trade of the Russian Federation. 7th International conference on education and social sciences (INTCESS 2020), pp. 44–50. Dubai: JAN 20–22
- Yip, Zypelh, R. Y., & Young, D. (2012). Does mandatory IFRS adoption improve information comparability? *The Accounting Review*, 87, pp. 1767–1789.

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HOW TO MAKE CORPORATE SOCIAL DISCLOSURES COMPARABLE?*

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Abstract. The paper aims to develop instruments supporting the comparability of social disclosures and ipso facto business transparency. This research study aims to assess the possibility of achieving social disclosure comparability based on research of the Polish listed companies and to develop an authorial tools which may support stakeholders in comparing social performance and thus help them make business decisions. To attain the goals, this article introduced practical and theoretical premises of sustainability reporting development in its social dimension. Based on that, an empirical study was conducted on the comparability of social disclosures in sustainability reporting of Polish listed (WIG20) companies. For this purpose, a social disclosure index was developed by the authors. The findings of our study indicate that corporate social disclosures can be the subject of comparisons supporting stakeholders in the decision-making process. The conducted comparability analysis refers to the comparison of the scope of disclosures between the WIG20 companies, as well as the scope of disclosures over three years, and helps us to construct the index as a tool for social disclosure benchmarking. This paper contributes to filling the gap relating the social disclosure comparability. The results of this study may help compare any social disclosures, and the proposed index may be a practical instrument of benchmarking. The research originality refers to the research niche relating to the difficult comparison of non-financial data and the scope of social disclosures in sustainability reporting. It extends the knowledge on this area by giving a new perspective on the comparison of social disclosures.

Keywords: comparability; non-financial reporting; responsibility; social disclosures; sustainability; sustainability reporting

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JEL Classifications: M41, M48, Q5

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1. Introduction

A rising trend for corporate social disclosures in sustainability reporting may be viewed as a response to the growing needs of stakeholders and legislative changes introduced by governments in that respect. It may tend to raise the consciousness of a historical lack of concern for it and to promote social aims in the corporate context. Thus, the amalgamation of disclosure requirements with social goals tends to signal a convergence of private and public goals in the corporate sphere (Choudhury, 2016). Moreover, this trend is also due to two other factors - reducing the information asymmetry between stakeholders and organizations, as well as improving corporate accountability. The transparency provided by social disclosures may also encourage stakeholders to engage in these issues. The research results so far indicate that social disclosures are expected by stakeholders to be credible and comparable (Widiarto Sutantoputra, 2009; Fifka, 2013; de Souza Gonçalves *et al.*, 2014; Martínez-Ferrero *et al.*, 2016).

The essence of social disclosures limits the possibilities of assessing and comparing the results (both against the industry and the individual's progress over time), as they serve to reveal such difficult-to-measure categories as, for example, labor/management relations, occupational health and safety, training and education, diversity and equal opportunity, non-discrimination, freedom of association and collective bargaining, rights of indigenous peoples, human rights assessment, local communities, supplier social assessment, customer health and safety, socioeconomic compliance. Their assessment by stakeholders interested in sustainable development may be of key importance in their decisions, hence the need to build instruments supporting the assessment of disclosures in this area.

The scope of reporting on the social aspects of sustainable development varies between countries, as well as between industries and individual entities. Social issues may be presented in a variety of ways – as descriptive and numerical information disclosed obligatorily or optionally, presented according to various national or international standards, as a separate statement or as part of annual reports. Additionally, the different scope of disclosures, including social disclosures, is also influenced by environmental, cultural, social, ethical, and historical factors (Van der Laan Smith *et al.*, 2005; Orij, 2010; Ali *et al.*, 2017; Zyznarska-Dworczak, 2018a), which additionally makes it difficult to compare social disclosure. Moreover, social disclosure obligations mainly focus on narrative information, meaning that the information is more difficult to standardize and does not easily enable comparisons or benchmarking (Choudhury, 2016). Thus, the dominant non-financial nature of social disclosures hinders their estimation by stakeholders based on sustainability reporting and thus may adversely affect their decision-making. So, it is necessary to develop instruments supporting the comparability of these results, and ipso facto business transparency.

Therefore, the main goal of the study was to contribute to understanding of the growing importance of corporate social disclosure in sustainability reporting. This research study aimed to assess the possibility of achieving social disclosure comparability based on the research of Polish listed companies (included in the WIG20 index) and to develop an original authorial tools, which may support stakeholders in comparing social performance and thus help them make business decisions. To attain the goals, this article introduced practical and theoretical premises of sustainability reporting development in its social dimension. Based on that, an empirical study was conducted on the comparability of social disclosures in sustainability reporting of Polish listed (WIG20) companies. As a result, a rating of the listed companies and a social disclosure index were developed by the authors. This study applied the following research methods: literature review, content analysis, desk research, Delphi method, tools of descriptive statistics, the method of induction, and synthesis.

The findings of our study indicated that corporate social disclosures can be the subject of comparisons supporting stakeholders in the decision-making process. The conducted comparability analysis referred to the comparison of

the scope of disclosures between the Polish-listed companies (WIG20), as well as the scope of disclosures over three years, and helped us to construct the index as a benchmarking tool for the social disclosure. This instrument may support the stakeholders by indicating whether the scope of data disclosed by a given company is higher or lower than the index average. Moreover, this index and its structure allow being used also to evaluate the other two disclosure areas of corporate sustainability: governance and environment. Furthermore, since there are only few studies that examine the importance of social disclosures in sustainability reporting, little is known about the comparability of social disclosures presented in sustainability reports. This paper contributes to filling this gap. The results of this study may help in the comparison of social disclosure, and the proposed index may be a practical instrument of benchmarking.

This study provides new insights into the niche relating to the difficult comparison of non-financial data and the scope of social disclosures in sustainability reporting, thus contributing to the literature in this research area and supporting data reliability and transparency in practice. It relates to the proposal of the authorial index, which enables benchmarking and comparing the corporate results in the social area of corporate sustainability. It extends the knowledge on the practices concerning sustainability reporting in this area by giving a new perspective on the comparison of social disclosures, a topic that has not yet been investigated in-depth.

This article proceeds in six parts. The next section provides the research background explaining the trend in social disclosure research and justifies the conducted study. It offers a review of the relevant literature, defines the research gap and develops the research hypotheses. The third section of the paper presents empirical research. It describes the sample and variables, the methodology, and the research model that is applied in data analysis and hypothesis verification. Furthermore, it provides the assessment and the segmentation of disclosure standards based on the Delphi method, the proposal of a rating of social disclosure comparability, as well as the authorial index formula. The fourth part presents the results, and the fifth one discusses them. The last part of the paper outlines the conclusions of the research paper.

2. Practical and theoretical underpinning, literature review and hypotheses development

Nowadays, sustainability reporting is developing so intensely and in so many directions that it raises many problems in ensuring the comparability of the data disclosed in it. Enterprises' involvement in disclosure of information may be interpreted both from the perspective of legislative premises and scientific and theoretical justification.

Sustainability reporting is currently developing significantly and the changes observed in the practice of enterprises can be interpreted both from the perspective of legislative premises and scientific justification. Across the world, there are many various organizations, initiatives and regulations whose aim is to help to achieve the worldwide convergence and harmonization of sustainability reporting standards. Currently, GRI (Global Reporting Initiative) Standards are considered to be the most common harmonized and flexible reporting model (Skouloudis *et al.*, 2010; Boiral, 2013). Since 2000, a total of over 38.5 thousand non-financial reports have been published as per the GRI regulations all over the world, which accounts for more than 60% of all such reports (SDD). Pursuant to the regulations, social disclosures should include minimum 19 disclosure categories comprising as many as 76 diverse, non-financial metrics (GRI Standards, 2016). Moreover, in the European context, since 2014 corporate social disclosures have been obligatory for major listed companies. It was the year when the European Directive 2014/95/EU regarding the disclosure of non-financial and diversity information enforced a radical shift from voluntary to mandatory disclosure of non-financial information (Doni *et al.*, 2019).

The legal basis in this respect may be the national, EU or international regulations, as a result of which the scope of non-financial information disclosed by enterprises is diverse, and reports as such are hardly comparable in terms of both time and space. For example, in Poland corporate social disclosures have been obligatory for major

listed companies since 2017 [1], however, according to some empirical research (Szadzińska *et al.*, 2018; Czaja-Cieszyńska and Kochański, 2019; Krasodomska and Zarzecka, 2020; Krasodomska *et al.*, 2020) the form of the disclosures still varies, and the scope of the information presented is diverse, especially across various industries. The usefulness of Directive 2014/95/EU in its current form was questioned in many research studies (e.g. Biondi *et al.*, 2020; De Luca, 2020) - on the one hand, it is a key legislative act that represents an important step towards standardization of sustainability reporting and formalizing the transparency requirements, but on the other hand, it still does not ensure comparability of sustainability disclosures revealed by companies (Venturelli *et al.*, 2017; Doni *et al.*, 2020; Krasodomska and Zarzycka, 2020; Czaja-Cieszyńska, 2018).

The existing research studies regarding social disclosure in sustainability reporting are a response to a change in the economic reality. Striving to ensure the highest quality of information disclosed by enterprises is usually justified in the literature from the perspective of three mainstream theories, namely legitimacy theory, stakeholder theory and institutional theory (Chen and Roberts, 2010; Fernando and Lawrence, 2014; Fernando and Lawrence, 2014; Kaur and Lodhia, 2018). Thus, they may explain why organizations make or should make certain social disclosures within their annual reports or within other corporate reports regardless of the regulations.

Proponents of the stakeholder theory (e.g. Freeman and Reed, 1983; Donaldson and Preston, 1995) argue that stakeholder support is critical for the survival of an organization (Kamal, 2021). Therefore, corporate decisions relating to social disclosures should be primarily focused on the information needs of stakeholders (Krasodomska and Zarzycka, 2020). Based on this approach, organizations may enhance stakeholder relations by making social disclosures (Farneti *et al.*, 2019) and thus maintain its 'license to operate' in the society by complying with the expectations of the community according to the theory of legitimacy (see more in: Patten, 1991; O'Dwyer, 2001; Deegan, 2002; Ali, Lodhia and Narayan, 2020). The legitimacy theory is also used to identify disclosure strategies pursued by firms in reaction to the new regulation (Di Tullio *et al.*, 2019). It treats corporate social disclosure as a way to fulfill the organization's social contract focused on winning social acceptance, and retaining it to justify the legality of its corporate activity (Zyznarska-Dworczak, 2018b).

Furthermore, the institutional theory emphasizes that incorporation of institutionalized norms and rules may help to gain stability and enhance survival prospects. This theory views the pattern of the established institutions as the symbolic representation of the social value system (Chen and Roberts, 2010). Based on this approach, social disclosure is determined by several institutional conditions: public and private regulations, institutionalized norms regarding appropriate corporate behavior, associative behavior among corporations themselves, and organized dialogues among corporations and their stakeholders (Campbell, 2007). Moreover, in the perspective of the institutional theory, social disclosure may be treated as an answer of an entity because such reporting practice is commonly implemented by other similar organizations as part of normal business. Nevertheless, such institutional pressures may differ among geographical regions or industries and have a different effect on the behavior of a company (Pedersen *et al.*, 2013).

From the perspective of these three theories, social disclosure may be treated as a manifesto of a company's accountability and its own social value system, based on the institutionalized approach of sustainable development dedicated to stakeholders' expectations as well as to the social contract with the company's environment. However, its reliability is determined by the possibility of comparing the achievements reported by the company against the background of other entities.

For a synthetic and structured analysis of the research area literature, the bibliometric method was applied, based on the Web of Science (WoS). To identify trends in the analyzed area, the bibliometric test included the research studies having in their thematic scope: sustainability, disclosure, social, and comparability. In this way, a database was created, containing 328 publications, covering research articles, conference papers, and review papers relating to social disclosures. The first part of the bibliometric study was based on two different sets of

bibliometric data from 1945–2020: the number of publications and its geographical origin (Tables 1–2), whereas the second part of the bibliometric study was related to citations and citation statistics.

The number of publications relating to social disclosures has increased significantly in the last four years, which accounts for over 60% of all publications in the analyzed scope (Table 1).

Table 1. Social disclosure research in the context of comparability in 1945-2020

	Total	Until 2008	2009–2012	2013–2016	2017–2020
% of 328	100%	1.22%	10.37%	26.22%	61.89%
number of publications	328	4	34	86	203

Source: Own elaboration based on Web of Science of April 1, 2021.

Although the science interest in disclosures related to social issues has been steadily growing for the past two decades, it can be concluded that the breakthrough in the dynamics of the growing number of research studies in this area came after 2016. Assuming that European countries lead the way in social disclosure requirements (Choudhury, 2016), this metamorphosis may be seen as an effect of the European Directive 2014/95/EU regarding the disclosure of non-financial and diversity information. Its transposition deadline for the 28 EU Member States into their national legislation was fixed on 6 December 2016, nevertheless, the scope of transposition differed from country to country, resulting in different amounts of information having to be disclosed. Market participants in Western European countries have significantly different perspectives on the importance of corporate responsibilities than those in Central and East European countries (Fijałkowska *et al.*, 2018). Moreover, the different scope of disclosures, including social disclosures, and thus the research interest in this area, is also influenced by some factors relating to environmental, cultural, social, ethical, and historical aspects (Van der Laan Smith *et al.*, 2005; Orij, 2010; Ali *et al.*, 2017; Zyznarska-Dworczak, 2018a, 2020).

Thus, different interests in corporate social disclosures may also be seen from the perspective of geographical origin of the research (Table 2).

Table 2. Social disclosures research by countries in 1945-2020

Countries/regions	Record Count	% of 328
Spain	46	14.4
USA	46	14.4
Italy	34	10.7
Australia	29	9.1
England	29	9.1
Germany	22	6.9
China	20	6.3
Brazil	17	5.3
Malaysia	15	4.7
India	12	3.8
Portugal	11	3.5
France	10	3.1
New Zealand	9	2.8
Canada	8	2.5
Poland	8	2.5

Source: Own elaboration based on Web of Science of April 1, 2021.

As Table 2 shows, the countries like Spain, USA, Italy, and Australia are distinguished by the highest number of studies on social disclosures, taking into account the context of their comparability. Taking into account the Polish perspective as the research subject of this paper, Poland shows a low level of scientific interest in social disclosures (with 2.5% of the local database). Hence, the authors found that scientific area to be a niche.

The second part of the bibliometric test indicated citations to source items indexed within Web of Science Core Collection in 1998–2020 (social disclosure research was not published in the years 1945–1998). The citation statistics are presented in Table 3.

Table 3. The citation statistics of social disclosures research in 1998-2020

Citation Statistics	
Results found	328
Sum of the Times Cited	5400
Average Citations per Year	36.73
Average Citations per Item	16,93
h-index	37

Source: Own elaboration based on Web of Science of April 1, 2021.

Considering the short period of scientific interest in social disclosure, there is a relatively high response in the citations. However, based on the comparison of the cumulative citation results over the last 20 years, over 90% of them come from 2014-2020. Moreover, the conducted citation analysis allowed identifying the most popular research results - Eccles *et al.* (2014), Fifka (2013), Michelin *et al.* (2015), Mahoney *et al.* (2013) and García-Sánchez *et al.* (2013). Eccles *et al.* (2014) have observed that during the last twenty years a relatively small but growing number of companies have begun to voluntarily integrate social and environmental issues in their business models, organizational processes, and their strategy through the adoption of related corporate policies. Based on that, the researchers explored the organizational and performance implications for such organizations. They compared 180 US companies, 90 of which classified as High Sustainability companies, while another 90 - as Low Sustainability companies with the traditional model of corporate profit maximization in which social and environmental issues are typically regarded as externalities. The analysis conducted over the 18-year research period showed that the High Sustainability companies significantly outperformed their counterparts over the long-term, both in terms of the stock market and accounting performance, as well as that the market underestimated the future profitability of the High Sustainability companies compared to the Low Sustainability ones.

Such conclusions are consistent with the research results published in Michelin *et al.* (2015). The researchers investigated the quality of disclosure along three dimensions: the content and the type of information, as well as the managerial orientation. They found that the use of social responsibility practices was not associated with higher disclosure quality, suggesting that these practices were symbolic rather than substantive. The authors stated that such results may be a basis for increasing skepticism about the use of CSR reporting practices as tools used to enhance perceived accountability. Nevertheless, the authors proved that disclosures by GRI followers were more likely to be balanced, comparable, and precise.

The presented conclusions complement the research results obtained by Mahoney *et al.* (2013). The authors researched firms' motivations for social responsibility disclosure, found that firms that voluntarily issued standalone social reports generally had higher social performance scores. They stated that firms were using voluntary social reports to publicize stronger social and environmental records to stakeholders. Other factors of social disclosure are highlighted by Fifka (2013) and García-Sánchez *et al.* (2013). Fifka (2013), based on a meta-analysis of 186 studies, examined the determinants of social responsibility disclosure research. He proved that the general political and socio-economic environment had a very strong impact on reporting practices and the country-related factors showed a very strong correlation with reporting. García-Sánchez *et al.* (2013), in turn, examined the impact of the Hofstede national cultural system on integrated reporting to prove that companies located in societies with stronger collectivist and feminist values were in the vanguard of information integration. The analyzed publications, chosen based on the bibliometric test, show the main research problems concerning social responsibility disclosure i.e. different levels of firms' motivations, engagement, regulations, reporting standards, political and socio-economic factors. Social disclosure equally is affected by these difficulties relating to reliability, credibility, and comparability between entities, industries, and even between countries. So ensuring

comparability is one of the ways of providing transparency and reliability of disclosed data, both financial and non-financial. Given the above, hypotheses 1 (H1) can be formulated as follows:

H1. Corporate social disclosures provides little basis for comparability of social performance.

One way of the scientific approach to this research problem is to perform a qualitative analysis of non-financial reports and to create a social disclosure rating system for assessing firms' sustainability reports (Widiarto Sutantoputra, 2009; Orij, 2010). Nevertheless, the exciting research studies (e.g. Skouloudis et al., 2010; de Abreu et al., 2012; de Souza Gonçalves et al., 2014; Singhania and Gandhi, 2015) were dedicated to individual entities operating under national conditions (accordingly Greece, China, Brazil, India). Such an index very often combines all dimensions of sustainability, not only allowing social disclosure to be assessed. So our proposal is dedicated to corporate social disclosures, filling the gap in the existing several international ratings dedicated CSR/ESG disclosure (so combined social and environmental disclosure).

Moreover, taking into consideration the above mentioned differentiations among countries, and stakeholders' demand for reliable non-financial information, the authors of this paper took as the subject of the comparability of social disclosures in Poland. As table 2 shows, there is little research in the analyzed scope dedicated to Polish entities. Available studies (f.e. Czaja-Cieszyńska, Kochański, 2019; Fijałkowska et al. 2018; Hąbek, Wolniak, 2016; Krasodomska, 2015; Krasodomska, Zarzycka, 2020; Wirth, et al. 2016) indicate that corporate social disclosures of Polish companies are difficult to measure and to compare, and the quality level of the disclosures is generally low. So our research is due to support the following hypothesis (H2):

H2. Difficulties in assessing social disclosures imply the need to select quantitative measures to ensure comparability and thus help stakeholders compare social performance.

Thus, in view of the presented research niche in Poland (see Table 2), the following part of the empirical research is dedicated to Polish public companies, their social disclosure, and the social disclosure index.

3. Study design

In view of the role and significance of corporate social disclosures for development of non-financial reporting in Poland, the research process was divided into three stages. The first stage of the empirical study was the analysis of the advancement level of non-financial reporting in the individual companies included in the WIG20 index. Completion of the research task required taking two actions. Firstly, it was necessary to define the non-financial metrics of key importance for stakeholders with regard to social disclosures in sustainability reporting. To that end, the Delphi method was applied. Secondly, it was followed by a thorough analysis of secondary data in the form of non-financial reports adopted for the study, using the desk research method.

Delphi method is an expert method, being one of the heuristic methods. It is applied in making decisions based on experts' knowledge, experience and opinions. The primary research technique applied here was surveying. The survey questionnaire was developed in the Microsoft Forms application and comprised two parts: demographics and content-related questions. The content-related part of the survey consisted of 76 questions presenting 76 non-financial metrics in 19 disclosure categories in the social area, recommended by the GRI Standards. The experts, using the 3-point Likert scale, were asked to assess the significance of the indicated non-financial metrics from the point of view of companies' stakeholders. The survey involved a group of 15 non-financial reporting specialists including auditors (4), chief accountants (5), academics and business people (6). The respondents were selected on a targeted basis. The survey was conducted in the period from 01.12.2020 to 31.12.2020. It should be noted that the proper survey was preceded by a survey pilot (a pilot test). The survey pilot involved three experts and was aimed at improving the prepared survey questionnaire and making sure the research tool had been

properly constructed. Only the modified survey questionnaires (i.e. improved to include the suggestions of the survey pilot group) were sent to the other experts (on-line survey). Based on the obtained expert opinions, the non-financial metrics that characterized social disclosures were divided into three groups: hardly significant, moderately significant, and very significant metrics. The classification of the non-financial metrics that characterize the social aspects of non-financial reporting, showing their level of significance, is presented in Table 4.

Table 4. Assessment of social disclosures metrics

Number	Disclosure category	Classification of non-financial metrics			Total
		Hardly significant metrics	Moderately significant metrics	Very significant metrics	
GRI 401	Employment	6	2	0	8
GRI 402	Labor/management relations	0	2	0	2
GRI 403	Occupational health and safety	7	12	3	22
GRI 404	Training and education	0	4	1	5
GRI 405	Diversity and equal opportunity	0	4	1	5
GRI 406	Non-discrimination	0	0	2	2
GRI 407	Freedom of association and collective bargaining	2	0	0	2
GRI 408	Child Labor	1	2	0	3
GRI 409	Forced or compulsory labor	0	2	0	2
GRI 410	Security practices	1	1	0	2
GRI 411	Rights of indigenous peoples	2	0	0	2
GRI 412	Human rights assessment	0	3	0	3
GRI 413	Local communities	0	2	0	2
GRI 414	Supplier social assessment	1	4	0	5
GRI 415	Public Policy	0	2	0	2
GRI 416	Customer health and safety	0	0	2	2
GRI 417	Marketing and labeling,	0	4	0	4
GRI 418	Customer privacy,	0	0	2	2
GRI 419	Socioeconomic compliance	0	0	1	1
Total:		20	44	12	76

Source: own work.

The experts' indications regarding the significance of the individual non-financial metrics were the starting point for the subsequent stage of the empirical study, i.e. the analysis of secondary data in the form of non-financial reports adopted for the study, using the desk research method. This part of the research process consisted in evaluation of the scope of disclosures made by the companies included in the WIG20 index. The research sample was made up from the companies listed at the Warsaw Stock Exchange and included in the WIG20 index (as at the end of December of each year covered by the study). The sample was selected on a targeted basis, as the WIG20 index covers 20 biggest companies in terms of capitalization and turnover value [2]. The companies represent various sectors of the economy (Table 2). The WIG20 index is dominated by banks, but there are also companies from more capital-consuming sectors characterized by higher values of tangible fixed assets, e.g. fuels or power engineering, as well as new technologies such as telecommunications and gaming sectors. The time scope of the study covers the non-financial reports for 3 full reporting periods, i.e. for the years 2017–2019, when it became obligatory for the biggest Polish public interest entities to report extended non-financial information. The list of Polish-listed companies covered by the study is presented in Table 5.

Table 5. WIG20 companies

WIG20 as at:								
31.12.2017			31.12.2018			31.12.2019		
Comp any ticker	Weight in index (%)	Sector	Comp any ticker	Weight in index %	Sector	Comp any ticker	Weight in index	Sector
PKN	15	Fuels	PKN	14.43	Fuels	PKN	13.23	Fuels
PKO	15	Banks	PKO	15	Banks	PKO	15	Banks
PEO	9.06	Banks	PEO	8.16	Banks	PEO	8.12	Banks
PZU	11.97	Insurance	PZU	11.47	Insurance	PZU	10.48	Insurance
KGH	7.02	Mining	KGH M	6	Mining	KGH	5.99	Mining
SPL	5.39	Banks	SPL	5.92	Banks	SPL	4.76	Banks
PGE	4.39	Energy	PGE	4.65	Energy	PGE	3.3	Energy
PGN	4.55	Fuels	PGN	4.98	Fuels	PGN	3.67	Fuels
LPP	4.84	Clothing	LPP	5.09	Clothing	LPP	5.54	Clothing
CPS	2.44	Telecommunications	CPS	3	Telecommunications	CPS	3.83	Telecommunications
CCC	3.37	Clothing	CCC	2.57	Clothing	CCC	1.53	Clothing
MBK	2.75	Banks	MBK	2.55	Banks	MBK	2.46	Banks
ALR	2.88	Banks	ALR	2.24	Banks	ALR	1.31	Banks
OPL	1.62	Telecommunications	OPL	1.55	Telecommunications	OPL	2.08	Telecommunications
LTS	2.47	Fuels	LTS	3.24	Fuels	LTS	3.67	Fuels
TPE	1.48	Energy	TPE	1.11	Energy	TPE	0.89	Energy
JSW	2.2	Mining	JSW	1.87	Mining	JSW	0.53	Mining
EUR	1	Groceries	EUR	0.65	Groceries	PLY	1.77	Telecommunications
ACP	1.48	IT	CDR	4.62	Gaming	CDR	8.71	Gaming
ENG	1.09	Energy	ENG	0.91	Energy	DNP	3.12	Groceries

Source: own study based on the Stock Exchange data. List as at the end of December of each year covered by the study.

When the research material had been gathered, a preliminary analysis was conducted for the total of 60 non-financial reports adopted for the study. For 57 of them, the basic legal framework was the GRI Standards, which confirmed the domination of these regulations in Poland, and at the same time legitimized selecting them for the research process by the authors. As already said above, pursuant to the GRI Standards, social disclosures comprise 19 categories. Within those categories the total of 76 non-financial metrics were defined. In the analysis of their disclosures, a dichotomous scale of either “0” or “1” was adopted, where 1 confirms disclosure (the given non-financial metric was provided in the report), and 0 means the metric was not disclosed. Further on, the evaluation of the advancement level in sustainability reporting was extended to include the significance level for the individual metrics, specified by the experts. Upon dividing the metrics into three groups, each of them was assigned a multiplier. For hardly significant metrics the multiplier was “1”, for moderately significant ones – “1.5”, whereas for very significant metrics – “2”. As a result, the maximum score obtainable in any given year by each of the analyzed companies was 110. Table 6 presents the metrics valuation procedure adopted in the research process.

Table 6. Metrics valuation

s/n	Description	Classification of non-financial metrics			Total
		Hardly significant metrics	Moderately significant metrics	Very significant metrics	
1.	Number of non-financial metrics of social disclosures	20	44	12	76
2.	Multiplier	1	1.5	2	X
3.	Max. score obtainable in the given metrics group	20	66	24	110

Source: own work.

Based on the total score obtained by a given company in a given year, the advancement level of individual companies in social disclosures was assessed. The disclosure rating was specified based on a 5-grade scale from A+ to E, where A+ means the most advanced level, and E – very low. Such a rating enables comparability of corporate social disclosures. Reference values for the individual categories are presented in Table 7.

Table 7. Assessment social disclosures

The total score calculated for a report of a given company – reference values	Advancement level	Rating of a given company
88 - 110 77 - 87	Very high	A+ A
61 - 76 44 – 60	High	B+ B
28 – 43	Medium	C
17 – 27	Low	D
0 – 16	Very low	E

Source: own work.

The last (third) stage of the research process was aimed at developing the authorial index of social disclosure in sustainability reporting and the aggregate evaluation of all the analyzed non-financial reports as at the end of December of each year covered by the study. The index provides information about the aggregated corporate social disclosures of the WIG20 companies, thus enabling comparability of corporate social disclosures. Based on an assumption that the index structure should be simple and understandable, but also comparable over time, the devised index took the following form:

$$NFR_S INDEX = \sum_{i=1}^{20} n_i w_i$$

where:

NFRs INDEX - index of social disclosure in sustainability reporting

n_i- the score of the *i*th company, obtained in the individual assessment of the non-financial report for the given year

w_i- weight of the *i*th company in the WIG20 index

he devised index is a tool for comparing over time the advancement level of social disclosures in non-financial reporting for all the companies included in the WIG20 index. The index product consists of factors updated on an annual basis, i.e. the total score obtained by the company for the report (*n_i*) and the weight of the *i*th company in the WIG20 index (*w_i*). Its value may range from 0 to 110. The higher the index value, the higher the scope of corporate social disclosure. The *NFR_S* index does not reflect the market valuation of companies, the way it is the case for the WIG-ESG index [3] – as it mainly serves the information purposes (Stock Exchange). Eligibility for

WIG-ESG is based on reports prepared by the independent provider of ESG research and ratings, Sustainalytics B.V., and on the Good Practices ranking based on statements made by companies with regard to application of corporate governance principles in their annual reports (Stock Exchange). Summing up the above considerations, it may be stated that the NFR_S index could form the eligibility basis for stock exchange indexes, while it cannot substitute the WIG-ESG index, due to, inter alia, other functions. The WIG-ESG index performs the basic functions of a typical stock exchange index, such as information or comparison functions. In turn, the NFR_S index disregards the stock market valuation of the companies and performs only the information function with regard to the level and scope of non-financial information disclosure.

4. Results

The non-financial reports analysis has shown a considerable diversity within the scope and manner of presenting social disclosures, which makes it difficult for stakeholders to compare them. The results presented below seem to confirm the formulated hypothesis. Both the differences in data presentation and the scope of information included in non-financial reports lead to the statement that comparability of corporate social disclosures requires a quantitative approach. Therefore, in accordance with the adopted methodology and research procedure presented in Table 6, each of the companies covered by the study and included in the WIG20 index was assessed via assigning an appropriate scoring method as per the adopted dichotomous scale (either “0” or “1”) which was then multiplied by the significance multiplier (“1”, “1,5”, “2”). The aggregate scores obtained by the studied companies are shown in Figure 1.

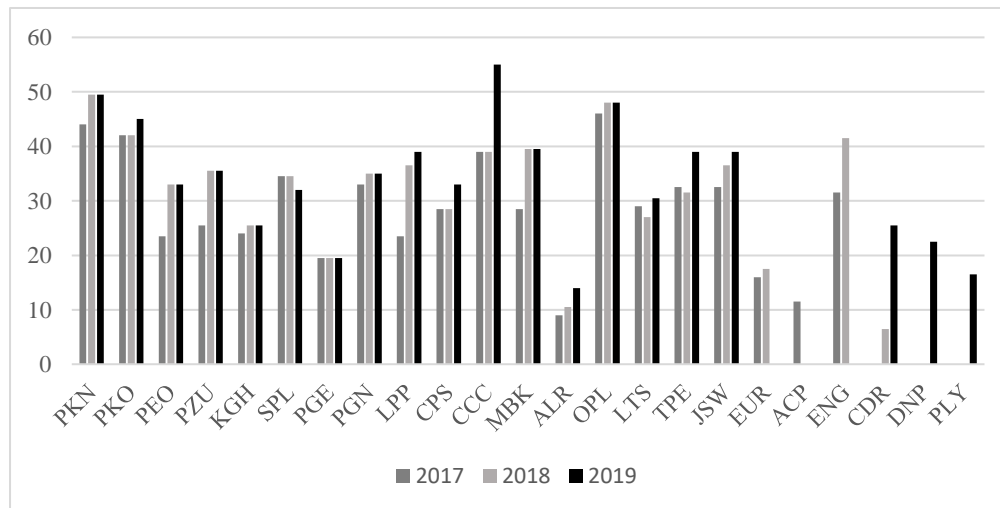


Figure 1. Results of social disclosures by company

Source: own study (x means that in the given year the company was not included in the WIG20 index).

It should be noted that none of the companies in any of the studied periods obtained more than 50% of the maximum possible score (110). The best score was attained by CCC in 2019: it was 55. There are at least several reasons explaining the relatively low scores obtained as a result of evaluation of the scope of published non-financial information. In the first place, the regulations on non-financial reporting have been in place for a short time. Moreover, despite the existing obligation, the scope of information to be published by companies has not been precisely specified. Consequently, it is up to the company to decide what kind and scope of information (and in which form) is to be published. It seems that there is a lack of appropriate incentives that would motivate companies to disclose non-financial information in a reliable and complex manner. However, the establishment of the WIG-ESG index by the Warsaw Stock Exchange may be considered to be a certain incentive inviting entities

to increase the level of non-financial information disclosure. The WIG-ESG index provides its companies with a better ranking and improves its corporate image. Nevertheless, undoubtedly the transposition of Directive 2014/95/EU into the Polish legislation has increased the scope of corporate social disclosures, which is visible while comparing the disclosures for 2018 with those for 2017 (Figure 1). Certainly, there are still companies with no quantitative improvement or just little progress in the scope of disclosures. However, in the course of studying the non-financial reports, a qualitative improvement in 2018 (compared to 2017) was observed. Namely, the complexity and standard of the non-financial data presentation were higher, which is seen as an influence of CSRD. Hence, the scoring can be seen as a helpful method facilitating the comparability. However it is still limited due to the different scope of disclosers, since it not allowed to compare the quality. The scores obtained for the totality of the studied companies were analyzed using the basic metrics of descriptive statistics (Table 8). It is possible to notice the improved level of advancement in non-financial information disclosures in 2018, compared to 2017, which is confirmed by the position metrics such as the mean, median, quantile I and III. Year 2019 may be called the stabilization year, even though the increase in minimum value, increase in maximum value and increase in average scores obtained by the WIG20 companies may manifest a continuing rise in the advancement level. It should be noted that the drop in the minimum value in 2018 was due to the change in the WIG20 index composition [4]. The score of 7 was obtained by a company making its debut in the index. The drop in the median in 2019 can be explained on the same basis – two new companies were qualified to be included in the WIG20 index at that time.

Table 8. Descriptive statistics

Basic distribution metrics	2017	2018	2019
minimum value	9	7	14
maximum value	46	50	55
mean	29	32	34
median	29	35	34
Quantile I	24	26	26
Quantile III	34	39	39

Source: own work.

The quantitative metrics of corporate social disclosures and applying the same metrics for each of the examined entities are prerequisites necessary to achieve comparability. The constructed tools in the form of the disclosure assessment scoring system (Figure 1 and Table 8) meet the proposal indicated in the above mentioned three theories that social disclosure should be treated as a manifesto of a company's accountability and the social value system. What is more, quantitative tools enable not only benchmarking, but also identification of leaders, i.e. the enterprises for which social corporate disclosure forms part of their corporate image. Therefore, the presented approach makes it possible to positively verify H1, but with above mentioned limits. The engagement of scoring method allows to state which information is revealed by company. But still does not allow to assess the quality of the disclosers. Hence still companies can be scored at the same level, even the scope of revealed information differs on multiple levels. Lack of universal quantitative tools makes it impossible to objectively compare the scopes of non-financial information publications. Nevertheless quantitative tools such as the rating or below presented index allow comparability and create added value to stakeholders.

As a result of the comparative analysis, it is possible to state that the scores obtained by the individual companies (Figure 1) and the descriptive statistics metrics for the totality of the companies have shown an insufficient scope of social disclosures. Since the WIG20 index presents the top twenty of the biggest and strongest companies which are seen as the market benchmark in many areas, the highest possible score would be expected. Even though in individual cases some improvements can be observed, the scope is still low, and the maximum score for

social disclosures did not exceed 50% of the maximum value. Lack of incentives for publishing non-financial information is also noticeable among experts: the new directive draft proposed by the European Commission focuses on imposing an obligation on enterprises to provide qualitative and quantitative information. Despite the indicated differences in disclosing non-financial information across the individual countries, it seems that stakeholders' expectations are higher, therefore subsequent regulative measures are being taken.

The next stage of the empirical study was rating the individual companies on the basis of their scores. The rating shows their advancement level in terms of corporate social disclosures. Based on the score obtained by a given company in a given year, the companies were classified on a 5-grade scale from A+ to E, where A+ means the highest scope of corporate social disclosure, and E the lowest, pursuant to the methodology presented in Table 7. The highest rating assigned to the studied companies was B, which meant disclosing from 40 to 55% defined non-financial metrics. Both in 2017 and in 2018, the B rating was obtained by two companies, whereas in 2019 the number of B-rated companies doubled. The most numerous rating group was C (10 companies in 2017, 12 in 2018 and 10 in 2019). On average 2–3 companies obtained the lowest rating over the years. These most often were the companies making their debut in the WIG20 index, which for the first time had to tackle reporting of extended non-financial information. It is worth noting that none of the companies was able to achieve the highest ratings: A+, A or B+, which may be due to the relatively short experience of Polish companies in non-financial reporting and the insufficiently detailed legal regulations in that regard. Figure 2 shows the aggregate numbers of companies in individual rating groups with regard to S category non-financial reporting.

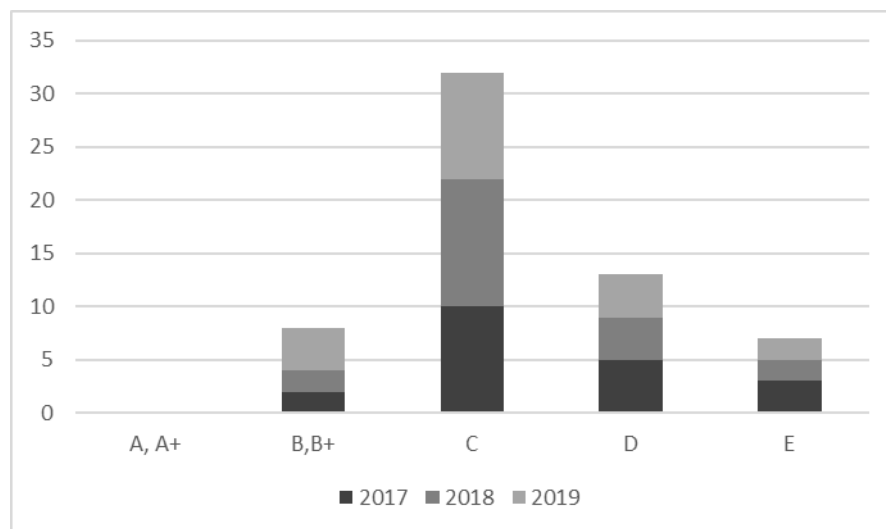


Figure 2. Benchmarking of corporate social disclosure – aggregated

Source: own work.

The analysis of the comparability of corporate social disclosure reporting led to the following conclusions: only two companies, i.e. PKN Orlen and Orange, having attained the B rating, managed to keep it throughout the study period. As many as seven companies improved their ratings in the analyzed period, increasing the scope of disclosures in the reports. These were: PKO BP, PEKAO, PZU, LPP, CCC, Eurocash, CD Projekt. The lowest rating (E) was obtained by Alior and Dino Polska. Table 9 shows detailed data about the ratings achieved by the individual companies. The ratings assigned to the companies (Figure 2, Table 9) on the basis of the scores obtained by them (Figure 1) confirm the conclusion that the companies covered by the study showed insufficient social disclosure levels. Benchmarking has demonstrated the prevalence of C and D ratings. The year-to-year improvement is visible mostly in 2018, while in 2019 there are only a few cases, which means that the legal regulations that entered into force in 2017 were sufficient to improve the scope of corporate social disclosures, but it was a one-off event. Hence, there is a need to create incentives that will keep the growing trend of improving

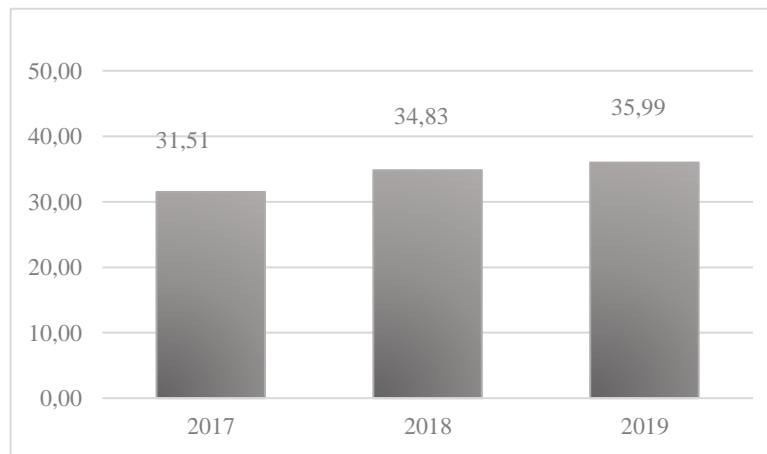
the non-financial reporting, and a rating or index with an objective and quantitative base can be used to encourage companies to take a challenge and show better social disclosure performance. The benchmarking results (Table 9) as well support the H2 and indicate that there is a need to imply quantitative measures to ensure comparability and thus help stakeholders compare social performance.

Table 9. Benchmarking of corporate social disclosures – individual

Company	2017	2018	2019
PKN	B	B	B
PKO	C	C	B
PEO	D	C	C
PZU	D	C	C
KGH	D	D	D
SPL	C	C	C
PGE	D	D	D
PGN	C	C	C
LPP	D	C	C
CPS	C	C	C
CCC	C	C	B
MBK	C	C	C
ALR	E	E	E
OPL	B	B	B
LTS	C	C	C
TPE	C	C	C
JSW	C	C	C
EUR	E	D	X
ACP	E	X	X
ENG	C	C	X
CDR	X	E	D
DNP	X	X	E
PLY	X	X	D

Source: own work.

As it was indicated, due to difficulties in assessing social disclosures in sustainability reporting there is a need to select quantitative measures to help stakeholders to compare social performance. The authorial NFR_S index is a tool that complements the considerations regarding social disclosures in non-financial reporting, and supports verification of the hypotheses. The NFR_S index is used for comparing over time the advancement level of non-financial reporting in S category for all the companies included in the WIG20 index. It is a sum of scores which the *ith* company obtained for the non-financial metrics disclosed in the report (n_i) and the weight of the *ith* company in the WIG20 index (w_i). Its value may range from 0 to 110. The higher the index value, the higher the scope of corporate social disclosure. The values of the NFR_S index for the whole WIG20 are shown in Figure 3.

**Figure 3.** NFR_S index values

Source: own work.

In 2017, the NFR_S value amounted to 31.51 points, whereas in 2019 it rose to 35.99. A comparative analysis of the index value makes it possible to draw a conclusion that the scope of corporate social disclosure in the WIG20 index companies has improved. The NFR_S index value has been rising, nevertheless it seems that a significant increase in disclosures cannot be expected without appropriate incentives or changes in the legal regulations.

5. Discussion

An important contribution to the research on social disclosures in non-financial reporting is the proposal to compare the content of the individual reports pursuant to uniform (standardized) principles. Application of a dichotomous scale (“0” no disclosure, “1” disclosure) in scoring method to assess corporate social disclosures, followed by presenting the results of the assessment in the form of benchmarking and an index allow for comparisons in the area of corporate social disclosures. A similar approach to assessment of corporate social disclosures was also taken by Singhanian and Gandhi (2015) and Skouloudis *et al.* (2010). In the latter case, however, scoring from 0 to 4 points was used. Drawing up standardized assessment procedures for corporate social disclosures enables achieving comparability via changing the narrative character of social disclosures, as indicated by Choudhury (Choudhury, 2016). Therefore, the study results may support stakeholders in comparing social performance and thus help them in business decisions, especially as such information is of major significance also in making investment decisions (Ernst and Young, 2017). The devised index, in turn, enables assessment of aggregated corporate social disclosures and constitutes a universal tool which may be applied in further studies.

The quantitative tools developed in order to assess corporate social disclosures described in this paper seem to be the answer to the needs of stakeholders who expected structured (La Torre *et al.*, 2018), reliable (La Torre, 2020) and comparable non-financial information (Carungu *et al.*, 2020). The authors proposed some tools that enable the comparability of social disclosures. The measures surely can be implied by stakeholders in comparing social performance. But still these measures are limited and there is the scope to develop more sophisticated tools/methods, where the quality of disclosures will be the issue.

Our article makes several contributions to the existing theory and research. Firstly, the conducted empirical study corresponds to the legislative changes proposed by the European Commission and the IFRS Foundation, as it focuses on improving the comparability of disclosures in sustainability reporting, including social disclosures.

Moreover, our research findings have confirmed the basic dysfunctions of the current reporting system, i.e. complexity, low reliability and limited comparability (in terms of time and space) of social disclosures. Also, the research results point to the need to introduce legislative changes. Secondly, our research fitted into the growing trend of research on corporate social disclosure and its comparability (see Table 1) and allowed us to find a justification for the theoretical assumptions of social disclosures in reporting. Despite the late development of CSR in Poland in relation to the West, as well as many cultural and economic limitations, Polish enterprises covered by the research study present a fairly high and growing interest in social disclosures. A social disclosure can be interpreted as a way to meet the expectations of stakeholders and as well as to legitimize corporate activities. It can also be read as an internal need of companies to show the represented system of social values. The scope of social disclosures is systematically growing, nevertheless the pace of changes depends on several institutional conditions that should be considered in the perspective of industry or benchmarking partners, which may strengthen the comparability of research results.

Our research approach extends the perspective of disclosure analysis presented so far in the literature on the subject. The research studies completed so far in that regard pertained mainly to publicly listed companies and focus on interdependencies between the scale of disclosures and liquidity, indebtedness, and profitability of the listed companies (Xiaowen, 2012) and on the relations between the scale of disclosures and the cost of equity (de Souza Gonçalves *et al.*, 2014). Like us, de Souza Gonçalves *et al.* applied the desk research method to analyze non-financial reports. Further, to evaluate the level of social disclosure of public companies in Brazil, they used an index of 13 indicators. However, this demonstration was based on an indicator that only evaluated social disclosure relating to external social programs, hence the analyzed scope of disclosure was narrower. Similarly to our research, they engaged benchmarking to enable the comparability of corporate social disclosures by classifying the information by level, from “restricted” (lowest level of information) to “low”, “medium” or “high” (de Souza Gonçalves *et al.*, 2014).

In addition to achieving comparability of corporate social disclosures, the outcome of this paper is the NFR_S index that enables aggregated assessment of disclosures. A similar task was tackled by, *inter alia*, Singhania and Gandhi (Singhania and Gandhi, 2015). They constructed the social and environmental disclosure index for Indian companies in order to examine the relationship between corporate social disclosures and selected corporate attributes. Similarly as in our case, their study covered listed companies, however, the index they applied in the assessment was unweighted, but similarly as in our research, a disclosure index approach was used to measure the extent of disclosure of social and environmental information. Singhania and Gandhi, likewise de Souza Gonçalves *et al.*, 2014, Skouloudis *et al.*, 2010, in the course of assessing corporate social disclosures focused on several kinds of disclosures, whereas our article applied as many as 76 metrics recommended by GRI. Due to that, application of the NFR_S index in business practice may bring a number of benefits in both macro and micro terms, because the index structure enables comparisons of corporate social disclosures for any group/ sector of listed companies, at any time and place (comparability in terms of time and space). Moreover, the devised index may also be applied in further studies, e.g. studying the relationship between corporate social disclosures and company characteristics such as sector of operations, size, and financial performance. In turn, from the point of view of a single enterprise, (on the micro scale) a high value of the NFR_S index provides a possibility of improving the company public relations and enhancing the company image as a partner for social activities (it contributes to development of social capital). In case the index value is low compared to competitors, this could be an incentive for the company to introduce changes and improve its social attitude.

Conclusions

Corporate social disclosure is one of the three pillars of sustainability reporting. However, due to the complexity and multidimensionality of this category, both the number and kind of disclosures applied by companies are varied. This was confirmed by the study described in this article, where by means of a standardized procedure a rating and an authorial index were developed. This made it possible to attain the goal, i.e. achieving comparability of corporate social disclosures among Polish listed companies.

Comparability of corporate social disclosures reveals gaps in the disclosing practices of publicly listed companies included in the WIG20 index. Hence there is much room for improvement, which could be significant from stakeholders' point of view. This was confirmed by both individual ratings of the particular companies, the data analysis for the totality of companies, and the NFR_S index values for the three subsequent business years. It appears that this state of affairs is attributable to several reasons. Firstly, Polish companies' experience in obligatory reporting of extended non-financial information is rather small, dating back to as late as 2017. Secondly, the scope of non-financial disclosures imposed by the accounting regulation is limited to a description of policies, results and risks identified by the entity with regard to social and labor issues, natural environment protection, human rights observance, and corruption counteracting. In this context, the Polish legal framework requires legislative changes to clarify the scope of non-financial disclosures and/or to develop a catalogue of recommended metrics. Finally, to achieve a higher level of non-financial reporting in Poland, it is necessary for companies not only to increase the number of presented metrics, but also to improve their quality. The narrative, declarative character of non-financial reports should be verified by external attestation bodies. In this context, it is worth underlining some practical implications resulting from the research study described herein. That is, the rating of the WIG20 companies and the NFR_S index values may become an important factor for investors in decision-making as well as for Polish legislative bodies in the law-making process.

However, drawing conclusions on the basis of the conducted empirical studies may be subject to certain limitations. Firstly, the research via the Delphi method was conducted on a small research sample, and the experts may be subjectively biased. Secondly, the sample size could be increased by considering more companies, or a sectoral approach might be used. Nevertheless, regardless of the identified limitations, this paper furnishes the ground for further research on a much broader scale (analyzing the NFR_S index over the subsequent years) and also in other areas of non-financial reporting (drawing up the NFR_G and NFR_E indexes).

References

- de Abreu, M. C. S., de Castro, F., de Assis Soares, F. and da Silva Filho, J. C. L. (2012), "A comparative understanding of corporate social responsibility of textile firms in Brazil and China", *Journal of Cleaner Production*, Vol. 20 No. 1, pp. 119-126, doi: 10.1016/j.jclepro.2011.08.010.
- Ali, W., Frynas, J. G. and Mahmood, Z. (2017), "Determinants of corporate social responsibility (CSR) disclosure in developed and developing countries: A literature review", *Corporate Social Responsibility and Environmental Management*, Vol. 24 No. 4, pp. 273-294, doi:10.4467/24498939IJCM.18.011.8390.
- Ali, I., Lodhia, S. and Narayan, A. K. (2020), "Value creation attempts via photographs in sustainability reporting: a legitimacy theory perspective", *Meditari Accountancy Research*, doi: 10.1108/medar-02-2020-0722.
- Biondi, L., Dumay, J. and Monciardini, D. (2020), "Using the International Integrated Reporting Framework to comply with EU Directive 2014/95/EU: can we afford another reporting façade?", *Meditari Accountancy Research*, Vol. 28 No. 5, pp. 889-914, doi: 10.1108/MEDAR-01-2020-0695.

- Boiral, O. (2013), "Sustainability reports as simulacra? A counter-account of A and A+ GRI reports, Accounting", *Auditing & Accountability Journal*, Vol. 26 No. 7, pp. 1036-1071, doi: 10.1108/AAAJ-04-2012-00998.
- Campbell, J. L. (2007), "Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility", *Academy of Management Review*, Vol. 32 No. 3, pp. 946-967, doi: 10.5465/amr.2007.25275684.
- Carungu, J., Di Pietra, R. and Molinari, M. (2020), "Mandatory vs voluntary exercise on non-financial reporting: does a normative/coercive isomorphism facilitate an increase in quality?", *Meditari Accountancy Research*, doi: 10.1108/MEDAR-08-2019-0540.
- Chen, J. C., and Roberts, R. W. (2010), "Toward a more coherent understanding of the organization–society relationship: A theoretical consideration for social and environmental accounting research", *Journal of Business Ethics*, Vol. 97 No. 4, pp. 651-665, doi:10.1007/s10551-010-0531-0.
- Choudhury, B. (2016), "Social disclosure", *Berkeley Business Law Journal*, Vol. 13 No. 1, pp. 183-218.
- Consultation Paper on Sustainability Reporting (2020), IFRS Foundation.
- Czaja-Cieszyńska H. (2018), "Non-financial reporting as a challenge for the contemporary accounting system", *European Journal of Service Management*, Vol. 27 No. 1, pp. 31-37, doi: 10.18276/ejsm.2018.27/1-04.
- Czaja-Cieszyńska, H. and Kochański, K. (2019), "Sustainable development reporting of selected socially responsible listed companies", *Zeszyty Naukowe Akademii Morskiej w Szczecinie*, Vol. 60 No. 132, pp. 93-100, doi: 10.17402/376.
- SDD (2021), „Sustainability Disclosure Database – GRI”, available at: <http://database.globalreporting.org> (accessed 30 April 2021).
- Deegan, C. (2002), "Introduction: The legitimising effect of social and environmental disclosures – A theoretical foundation", *Accounting, Auditing & Accountability Journal*, Vol. 15 No. 3, pp. 282–311, doi: 10.1108/09513570210435852.
- Di Tullio, P., Valentinetti, D., Nielsen, C. and Rea, M. A. (2019), "In search of legitimacy: a semiotic analysis of business model disclosure practices", *Meditari Accountancy Research*, Vol. 28 No.5, pp. 863-887, doi: 10.1108/MEDAR-02-2019-0449
- Donaldson, T. and Preston, L. E. (1995), "The stakeholder theory of the corporation: Concepts, evidence, and implications", *Academy of management Review*, Vol. 20 No. 1, pp. 65-91, doi: 10.2307/258887.
- Doni, F., Bianchi Martini, S., Corvino, A. and Mazzoni, M. (2020), "Voluntary versus mandatory non-financial disclosure: EU Directive 95/2014 and sustainability reporting practices based on empirical evidence from Italy", *Meditari Accountancy Research*, Vol. 28 No. 5, pp. 781-802, doi: 10.1108/MEDAR-12-2018-0423.
- Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 Amending Directive 2013/34/EU as Regards Disclosure of Non-Financial and Diversity Information by Certain Large Undertakings and Groups; EU law: Brussels, Belgium, 2014.
- Eccles, R. G., Ioannou, I. and Serafeim, G. (2014), "The impact of corporate sustainability on organizational processes and performance", *Management Science*, Vol. 60 No. 11, pp. 2835-2857, doi: 10.2139/ssrn.1964011
- Ernst and Young (2017), "Is Your Non-Financial Performance Revealing the True Value of Your Business to Investors? Tomorrow's Investment Rules 2017", available at: https://www.ey.com/en_gl/assurance/is-your-nonfinancial-performance-revealing-the-true-value-of-your-business (accessed on 19 April 2021).
- García-Sánchez, I. M., Rodríguez-Ariza, L. and Frías-Aceituno, J. V. (2013), "The cultural system and integrated reporting", *International business review*, Vol. 22 No. 5, pp. 828-838, doi: 10.1016/j.ibusrev.2013.01.007.
- Farneti, F., Casonato, F., Montecalvo, M. and de Villiers, C. (2019), "The influence of integrated reporting and stakeholder information needs on the disclosure of social information in a stateowned enterprise", *Meditari Accountancy Research*, Vol. 27 No. 4, pp. 556-579, doi: 10.1108/MEDAR-01-2019-0436.
- Fernando, S. and Lawrence, S. (2014), "A theoretical framework for CSR practices: Integrating legitimacy theory, stakeholder theory and institutional theory", *Journal of Theoretical Accounting Research*, Vol. 10 No. 1, pp. 149-178.
- Fijałkowska, J., Zyznarska-Dworczak, B. and Garsztka, P. (2018), "Corporate social-environmental performance versus financial performance of banks in Central and Eastern European countries", *Sustainability*, Vol. 10 No. 3, pp. 1-22, doi: 10.3390/su10030772.

- Fifka, M. S. (2013), "Corporate responsibility reporting and its determinants in comparative perspective—a review of the empirical literature and a meta-analysis", *Business Strategy and the Environment*, Vol. 22 No. 1, pp. 1-35, doi: doi:10.1002/bse.729.
- Freeman, R. E. and Reed, D. L. (1983), "Stockholders and stakeholders: A new perspective on corporate governance", *California management review*, Vol. 25 No. 3, pp. 88-106, doi: 10.2307/41165018.
- GPW (2021), Giełda Papierów Wartościowych w Polsce, available at: www.gpw.pl (accessed on 12 March 2021).
- GSSB (2016), Consolidated Set of GRI Sustainability Reporting Standards, available at: <https://www.globalreporting.org> (accessed on 12 March 2021).
- Hąbek, P., & Wolniak, R. (2016). Assessing the quality of corporate social responsibility reports: the case of reporting practices in selected European Union member states. *Quality & quantity*, 50(1), 399-420.
- Hazelton, J. and Perkiss, S. (2018), *How useful are CSR reports for investors? The problems of comparing environmental and social disclosures*, in Boubaker, S., Cumming, D. and Nguyen, D. (Eds.), *Research Handbook of Finance and Sustainability*, Edward Elgar Publishing, UK, pp. 93-109.
- Jackson, G., Bartosch, J., Avetisyan, E., Kinderman, D. and Knudsen, J. S. (2020), "Mandatory non-financial disclosure and its influence on CSR: An international comparison", *Journal of Business Ethics*, Vol. 162 No. 2, pp. 323-342, doi: 10.1007/s10551-019-04200-0.
- Krasodomska, J. (2015). CSR disclosures in the banking industry. Empirical evidence from Poland. *Social Responsibility Journal*, 11(3), 406-423. <https://doi.org/10.1108/SRJ-02-2013-0019>
- Krasodomska, J., Michalak, J. and Świetla, K. (2020), "Directive 2014/95/EU: Accountants' understanding and attitude towards mandatory non-financial disclosures in corporate reporting", *Meditari Accountancy Research*, Vol. 28 No. 5, pp. 751-779, doi: 10.1108/MEDAR-06-2019-0504.
- Krasodomska, J. and Zarzycka, E. (2020), "Key performance indicators disclosure in the context of the EU directive: when does stakeholder pressure matter?", *Meditari Accountancy Research*, Vol. 29 No. 7, pp. 1-30, doi: 10.1108/MEDAR-05-2020-0876.
- Kamal, Y. (2021), "Stakeholders expectations for CSR-related corporate governance disclosure: evidence from a developing country", *Asian Review of Accounting*, Vol. 29 No. 2, pp. 97-127, doi: 10.1108/ARA-04-2020-0052.
- Kaur, A. and Lodhia, S. (2018), "Stakeholder engagement in sustainability accounting and reporting", *Accounting, Auditing & Accountability Journal*, Vol. 31 No. 1, pp. 338-368, doi:10.1108/aaaj-12-2014-1901.
- La Torre, M., Sabelfeld, S., Blomkvist, M. and Dumay, J. (2020), "Rebuilding trust: sustainability and non-financial reporting and the European Union regulation", *Meditari Accountancy Research*, Vol. 28 No. 5, pp. 701-725, doi: 10.1108/MEDAR-06-2020-0914.
- La Torre, M., Sabelfeld, S., Blomkvist, M., Tarquinio, L. and Dumay, J. (2018), "Harmonising nonfinancial reporting regulation in Europe: practical forces and projections for future research", *Meditari Accountancy Research*, Vol. 26 No. 4, pp. 598-562, doi: 10.1108/MEDAR-02-2018-0290.
- Lombardi, R. and Secundo, G. (2020), "The digital transformation of corporate reporting – a systematic literature review and avenues for future research", *Meditari Accountancy Research*, doi: 10.1108/MEDAR-04-2020-0870.
- De Luca, F. (2020), "Prelims", *Mandatory and Discretionary Non-financial Disclosure After the European Directive 2014/95/EU*, Emerald Publishing Limited, Bingley, pp. i-xvi. doi: 10.1108/978-1-83982-504-020201001.
- Mahoney, L. S., Thorne, L., Cecil, L. and LaGore, W. (2013), "A research note on standalone corporate social responsibility reports: Signaling or greenwashing?", *Critical perspectives on Accounting*, Vol. 24 No. 4-5, pp. 350-359, doi: 10.1016/j.cpa.2012.09.008.
- Martínez-Ferrero, J., Ruiz-Cano, D. and García-Sánchez, I. M. (2016), "The causal link between sustainable disclosure and information asymmetry: The moderating role of the stakeholder protection context", *Corporate Social Responsibility and Environmental Management*, Vol. 23 No. 5, pp. 319-332, doi: 10.1002/csr.1379.
- Michelon, G., Pilonato, S. and Ricceri, F. (2015), "CSR reporting practices and the quality of disclosure: An empirical analysis", *Critical perspectives on accounting*, Vol. 33(C), pp. 59-78, doi: 10.1016/j.cpa.2014.10.003.

- Nicolo, G., Zanellato, G. and Tiron-Tudor, A. (2020), "Integrated reporting and European state-owned enterprises: A disclosure analysis pre and post 2014/95/EU", *Sustainability*, Vol. 12 No. 5, 1908, doi: 10.3390/su12051908.
- O'Dwyer, B. (2001), "The legitimacy of accountants' participation in social and ethical accounting, auditing and reporting", *Business Ethics: A European Review*, Vol. 10 No. 1, pp. 27–39, doi:10.1111/1467-8608.00209.
- Orij, R. (2010), "Corporate social disclosures in the context of national cultures and stakeholder theory", *Accounting, Auditing & Accountability Journal*, Vol. 23 No. 7, pp. 868-889, doi: 10.1108/09513571011080162.
- Patten, D.M. (1991), "Exposure, legitimacy and social disclosure", *Journal of Accounting and Public Policy*, Vol. 10 No. 4, pp. 297–308, doi: 10.1016/0278-4254(91)90003-3.
- Pedersen, E. R. G., Neergaard, P., Pedersen, J. T. and Gwozdz, W. (2013), "Conformance and deviance: Company responses to institutional pressures for corporate social responsibility reporting", *Business Strategy and the Environment*, Vol. 22 No. 6, pp. 357-373, doi: 10.1002/bse.1743.
- Singhania, M. and Gandhi, G. (2015), "Social and environmental disclosure index: perspectives from Indian corporate sector", *Journal of Advances in Management Research*, Vol. 12 No. 2, pp. 192-208, doi: 10.1108/JAMR-12-2013-0069.
- Skouloudis, A., Evangelinos, K. and Kourmoussis, F. (2010), "Assessing non-financial reports according to the Global Reporting Initiative guidelines: evidence from Greece", *Journal of Cleaner Production*, Vol. 18 No. 5, pp. 426-438, doi: 10.1016/j.jclepro.2009.11.015.
- de Souza Gonçalves, R., de Medeiros, O. R., Weffort, E. F. J. and Niyama, J. K. (2014), "A social disclosure index for assessing social programs in Brazilian listed firms", *Accounting in Latin America (Research in Accounting in Emerging Economies)*, Vol. 14, Emerald Group Publishing Limited, Bingley, pp. 75-103, doi:10.1108/S1479-356320140000014002.
- Szadziewska, A., Spigarska, E. and Majerowska, E. (2018), "The disclosure of non-financial information by stock-exchange-listed companies in Poland, in the light of the changes introduced by the Directive 2014/95/EU, *Zeszyty Teoretyczne Rachunkowości*, Vol. 99 No. 155, pp. 65-95, doi: 10.5604/01.3001.0012.2933.
- Widiarto Sutantoputra, A. (2009), "Social disclosure rating system for assessing firms' CSR reports", *Corporate Communications: An International Journal*, Vol. 14 No. 1, pp. 34-48, doi: 10.1108/13563280910931063.
- Wirth, H., Kulczycka, J., Hausner, J., & Koński, M. (2016). Corporate Social Responsibility: Communication about social and environmental disclosure by large and small copper mining companies. *Resources Policy*, 49, 53-60.
- Van der Laan Smith, J., Adhikari, A. and Tondkar, R. H. (2005), "Exploring differences in social disclosures internationally: A stakeholder perspective", *Journal of Accounting and Public Policy*, Vol. 24 No. 2, pp. 123-151, doi: 10.1016/j.jaccpubpol.2004.12.007.
- Venturelli, A., Caputo, F., Leopizzi, R. and Pizzi, S. (2019), "The state of art of corporate social disclosure before the introduction of non-financial reporting directive: A cross country analysis. *Social Responsibility Journal*, Vol. 15 No. 4, pp. 409-423, doi: 10.1108/SRJ-12-2017-0275.
- Xiaowen S., (2012), "Corporate Characteristics and Internal Control Information Disclosure- Evidence from Annual Reports in 2009 of Listed Companies in Shenzhen Stock Exchange", *Physics Procedia*, Vol. 25, pp. 630-635, doi: 10.1016/j.phpro.2012.03.136.
- Zyznarska-Dworczak, B. (2018a), "The development perspectives of sustainable management accounting in central and Eastern European countries", *Sustainability*, Vol. 10 No. 5, pp. 1-21, doi: 10.3390/su10051445.
- Zyznarska-Dworczak, B. (2018b), "Legitimacy theory in management accounting research", *Problemy Zarządzania*, Vol. 16 No.1 (72), pp. 195-203, doi: 10.7172/1644-9584.72.12.
- Zyznarska-Dworczak, B. (2020), "Sustainability Accounting—Cognitive and Conceptual Approach", *Sustainability*, Vol. 12 No. 23, 9936, doi: 10.3390/su12239936.

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BUILDING FINANCIAL LITERACY DURING THE COVID-19 PANDEMIC*

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Abstract. The main objective of the present research is to identify importance of financial literacy is growing in such economically and socially difficult situations. The aim of the study was to find out how a COVID-19 pandemic affects people's decisions regarding personal financial management in Latvia. The research is based on the analysis of the theoretical literature and quantitative analysis based on structured questionnaire was used to obtain empirical data. Empirical data processing and analysis were carried out in SPSS statistical package. The article findings trends, in Latvian households before COVID-19 over the last decade, the risk of poverty has increased convincingly certain groups in society. Affected by pandemic people's shopping habits have changed. Pandemic time led to changes in consumer attitudes and behavior, society's lifestyles and on the financial position of households. Under the restrictions imposed on preventing epidemic spread, household consumption decreased and create unplanned savings. Savings ensure the financial stability of households during the economic downturn.

Keywords: COVID-19; savings; consumption; Latvians' personal finance

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JEL Classifications: D1, D14

1. Introduction

Today the COVID-19 pandemic has changed the daily lives of people in many countries. It has affected the level and forms of the employability of an individual, freedom of movement and the way how income is spent. In such economically and socially difficult situations, the importance of financial literacy is being increased because these adverse circumstances which do not depend on a citizen significantly affect people who make financial decisions and change their behavior.

The pandemic exacerbated the economic crisis and showed how many people are financially vulnerable and how they are not prepared for the current situation (Allianz Research, 2020) and highlighted the low level of the

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financial literacy of households (Niu et al., 2020). Also, the issues raised on financial management skills in investment (Jiang et al., 2020), financial literacy and its relation with demand for life insurance products (Wang et al., 2021).

Financial well-being is a subjective vision for each individual, but in the short-term period it should take the form of an individual's ability to satisfy everyday needs and manage own finances successfully (Intrum, 2020). On the other hand, in the context of the human life cycle financial welfare concerns both the current financial security and the security of financial situation in the future (Lind et al., 2020). There are a number of important directions in the management of personal finance: the ability of a person to generate income, to make thoughtful decisions on own costs when if necessary there is a reasonable decision to raise funding by borrowing and finally to create a successfully balanced personal budget without forgetting about savings.

The goal of the research was to find out how the pandemic affects people's decisions on the management of personal finance answering such questions:

- What is a person's vision of risks during the pandemic?
- Is a household able to service credit obligations if its income is critically decreased or even lost?
- And finally, what is the trend in household savings?

The reality requires to review very important areas of personal finance planning: income generation opportunities, spending priorities, and closest financial goals. This is quite important because goal achievement depends on the level of savings.

2. Methodology

The research is based on the analysis of theoretical literature on COVID-19 issues relating to household finances particularly linking this to the impact of the pandemic on the Latvian household savings and consumption. A quantitative analysis based on a structured questionnaire was used to obtain empirical data. The questionnaire was worked out within the National Research Programme "Towards the Post-pandemic Recovery: Economic, Political and Legal Framework for Preservation of Latvia's Growth Potential and Increasing Competitiveness (reCOVery-LV)". The questionnaire was conducted between 11 September 2020 and 22 September 2020 using the method of direct interview surveying 1,011 respondents aged 18-75. The questionnaire consisted of two parts: demographic un measurement units assessed by a five-point Likert scale. Empirical data processing and analysis were carried out in SPSS statistical package.

3. Literature Review

The COVID-19 pandemic still spreads affecting all countries and their citizens. In general, approximately each fifth person would be in the risk group after being infected by COVID-19. However, this health risk varies significantly depending on age (Clark et al., 2020).

So far, many studies showed the negative impact of the pandemic on the country's GDP growth (König & Winkler, 2021; Coccia, 2021; Chowdhury et. al., 2021; Greve et al., 2021). Countries impose restrictions on movement and other measures aimed to curb the pandemic (Vasiljeva et al., 2020) suffering the economy as a result. There are adverse effects on public finances (Heald & Hodges, 2020), tax revenues are decreased (Clemens & Veuger, 2020), necessity to increase state aid and social benefits (Greve et al, 2021; Aidukaite et al., 2021). Each country develops its own compensation mechanisms according to the level of threat in order to maintain the viability of companies. If a company is unable to provide job for its employees, it impacts people's income.

Lower household incomes affect people's quality of life leading to mental health disorders and social problems (Sujadi, et al., 2020). There are also other risks arising from the pandemic that may influence the person:

- 1) Risk of social isolation. This group may include elderly people or people with mental health problems if they live separately and use online communication less frequently.
- 2) Employment risk. This can be typical of women providing childcare during school closures or self-employed in certain sectors (Douglas et al, 2020). There is evidence that financial knowledge makes a significant difference between genders: women know less than men (Alessie et al., 2021).

In modern society, people often struggle with financial problems and face different personal crises (Kadoya & Khan, 2020). National citizens can apply different action strategies to overcome the COVID-19 crisis (Priedola, 2020):

- Ostrich tactics or Ostriches – such people have an elusive and indifferent attitude toward the overall situation, don't feel the impact of the virus on their lives.
- Distant attitude or Que Seras – in general, confident in their safety and health, try to preserve common sense and not to lose the sense of reality.
- Wait-and-see approach or Hibernators – cautious, follow the rules, but not too concerned about the current situation and their own future.
- Following the rules or Good Citizens – they support strict enforcement, distant attitude toward the overall situation without panicking.
- Rely on some solution or Distressed Dreamers – concerned and genuinely alarmed by the current situation, place all trusts in the government, convinced that the government is doing everything possible to solve the crisis.
- Action requesting or Precarious Worriers – excited and scared, think that everything is bad, emotional difficulties in dealing with the situation, a high level of stress, dramatize the situation.

There are many studies showing that financial knowledge can reinforce the impact of personal traits that tend to be associated with positive financial behaviour (Cude, 2020), and this is very important because the pandemic has affected the economy and intensified financial instability (Lusardi et al., 2020). OECD gives the definition of financial literacy (Atkinson & Messy, 2012): a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being. Knowledge is not enough to make better financial decisions, but they are influenced by the individual's own interest in financial matters, the desire to take responsibility for long-term decisions relating to his or her finances (Gustman et al., 2012; Fernandes et al., 2014). In addition, it should be noted that people have objective and subjective financial knowledge (Lind et al., 2020). Under uncertainty it is very important to be able to make intelligent financial decisions for the benefit of own future and family needs (Allianz Research, 2020). The decline in disposable income creates a deficit between income and expenditure for lower-income households. Among these households, 70 percent likely won't have enough assets to sustain their spending for even a week (Adams-Prassl, 2020). For many consumers, their incomes are declining and they aren't optimistic about their country's economic prospects in the future. In studies conducted in the Great Britain and Sweden, for example, people are very pessimistic about future economic prospects, but they are less pessimistic about their private economic situation compared with the country's economy as a whole (Barrafrem, 2020).

4. Results

4.1. Trends in Latvian households before COVID-19

In October of 2020, the International Monetary Fund (IMF) estimated that the global economy will shrink 4.4% in 2020, the eurozone will contract by 8.3%. The IMF pointed out that the pandemic will have a particularly

negative impact on low-income households and this will hinder progress in reducing poverty in the world. In 2020, the Latvian GDP decreased by 3.6% compared with the previous year. In the GDP structure, private consumption accounted for 55% in 2020, 58.8% in 2019, and 57.8% in 2018. In 2020, compared to the previous year, total household expenditure fell by 10.3% (Central Statistical Bureau, 2020). It was mainly affected by the spread of COVID-19 virus in society which started at the end of the first quarter.

The situation and trends in Latvian households before COVID-19 are described in Table 1.

Table 1. Household composition, income, expenditure, and social inequality (2010- 2019)

Indicator	2010	2015	2018	2019
Average gross wages and salaries (euro)	633	818	1004	1076
Average net wages and salaries (euro)	450	603	742	793
Average size of household (persons)	2.5	2.44	2.33	2.31
Household ability to make ends meet (%)				
Easily or very easily	55.6	45.1	35.7	28.6
With some difficulty or fairly easy	42.6	49.5	56.8	62.4
With difficulty or great difficulty	1.8	5.1	7.4	9
At risk of poverty rate by age group (%)				
0-17	24.7	18.6	14.5	15.8
18-64	20.2	17.7	17.2	16.9
65+	9.1	38.1	47.9	40.9

Source: Central Statistical Bureau, 2019.

Over the last decade, the risk of poverty has increased convincingly (from 9.1% to 40.9%) for the members of society over 65 years of age. The share of society for which subsistence is easy or very easy has decreased and the share of which it is difficult or great difficult has increased from 1.8% to 9%.

According to the assessment of the respondents themselves, 23.7 per cent of them are in the risk group for which COVID-19 may cause severe health problems or even fatal outcome. The highest risk is among the elderly: in the age group from 64-75, there were 64.8% of respondents.

4.2. Impact of pandemic on shopping habits

The events of the last year have led to changes in consumer attitudes and behaviour, society's lifestyles and consumer spending.

The impact of the pandemic on people's purchasing habits and financial literacy was also examined and compared to the situation prior to the COVID-19 pandemic. People's shopping habits have also changed. Now, researchers distinguish between two effects: immediate effect and effect expressed later. The immediate effect is expressed in several ways (Sheth, 2020):

- 1) Hoarding – reaction to decrease uncertainty regarding future supply of products with aim to meet basic needs;
- 2) Improvisation – under established restrictions, current habits are changed and new consumption patterns are being developed;
- 3) Pent-up Demand – in time of crisis and uncertainty, purchases of durable goods are postponed;
- 4) Embracing Digital Technology – for own needs consumers have adopted a number of new technologies and their applications;
- 5) Store Comes Home – if everything is closed, the home becomes the place where people work, study, train, consume and go shopping online;
- 6) Blurring of Work – Life Boundaries – if needs and desires remain, they must be provided under limited

resources in order to save the boundaries between work and home;

- 7) Reunions with Friends and Family – implementation of social contacts via social media like Facebook, Instagram, WhatsApp, Twitter, and Zoom;
- 8) Discovery of Talent – using more flexible time at home promotes more effective process of creation of new ideas and encourages to try new ways to go shopping online more effectively.

The survey shows that nearly half of the population surveyed during the pandemic (49.9%) have not changed their shopping habits. Meanwhile, among those who have noted that shopping habits have changed, 38.5 percent visited stores less frequently without shopping on the Internet, and 9.3 percent preferred Internet purchases. In the group of respondents who indicated that they were in the risk group (people whom COVID-19 could cause severe health problems or even be fatal), the share of people who visited shops less frequently was slightly higher – 45.7%, but in this group Internet shopping was less popular – only 5.5%. This dynamic of changing habits can be explained by the fact that older people (55-75 years old) who are in the risk group do not have advanced skills in Internet shopping and do not use Internet connection very often unlike the younger people do. Thus, these people have been forced to either continue to shop in traditional shops as they have done, or to opt out of shopping.

As for payment habits, the survey also shows that more than a half (53.5%) of the population have not changed their habits. 33.3 percent indicated that they use a bank card or an Internet-bank as a payment method. In 2020, the number of payments increased by 5% compared to the previous year of 2019. In the second half of 2020, when the national emergency was cancelled for a while the number of public payments showed more than a 10% growth. In spring of 2020, a significant drop in activity was observed in e-commerce (number of payments fell by 9%), but in the second half of 2020 it rapidly grew by 26% (Bank of Latvia, 2020).

Banking services are actively used by people in young and middle age, with higher education, wealthy, of manager or specialist level. 10.1% of respondents noted that cash is being used for settlements more often. The highest rate of cash users is represented by people with basic education and low income. Unemployed, pensioners, and housewives also used more cash. Comparing data on changing shopping habits and on the habits of settlements it can be seen that these changes are not associated with vulnerable social groups.

4.3. The impact of pandemic on the financial position of households

In the European Consumer Payment Report 2020 Special Edition White Paper, the financial impact of COVID-19 on private households in 24 European countries is outlined. The results of the research show that household expenditure is declined in Latvia. In this context, the Latvian economy is impacted by the global pandemic in the same way as it happened in the other members of the European Union and other countries of the world. This is reflected in the negative dynamic of GDP (Intrum, 2020).

Almost one third of the Latvian households (29.3%) did not have any savings at the beginning of 2020. Savings of the majority (40.9%) of households would allow them to maintain the same standards of living for up to three months compared to only 29.8 % of households' savings whereof would allow to maintain the same standards of living for 3 months or more (Central Statistical Bureau, 2020). 69% of the Latvian citizens understand the importance of accumulating savings for hard times but the main reason why they do not do it is insufficient income (75% of the respondents without any financial reserves pointed out this reason) (Finance Latvia Association, 2020).

In 2020, the Luminor bank conducted a survey about accumulating savings among approximately 1,000 Latvian respondents aged 18-74. The survey results signalized about controversial trend – most often, people with high

income recognized the need to accumulate savings on a regular basis than people with low income for whom the financial airbag would be much more important (Luminor bank, 2020).

Euro area households' financial wealth consists mostly of liquid assets, such as currency and deposits. It also includes pension savings and insurance instruments. At the end of the second quarter of 2020, financial wealth per capita in Latvia reached 11,000 EUR against the average value of 53,000 EUR within the EU (European Central Bank, 2020).

Businesses in certain sectors cannot continue their activities because of restrictions imposed by the government, their employees are idle, and even if the state grants some benefits - they are, however, below the level of income generated before the pandemic. 26.1% of respondents indicated that they experienced a reduction in their incomes during the pandemic. Restrictions are one of many options to reduce the spread of the virus but this means that social isolation measures taken by many countries created new consumer trends such as the abolition of public events and traveling, changes in family habits (because parents have to work remotely while children learn subjects in online platforms from home). All this leads to a reduction in spending – it was noted by 17.3% of respondents.

Most broadly, the revenue cuts have been experienced by middle-generation residents (33.3% of respondents). Having asked about the impact of the pandemic on the ability to meet financial obligations, 26.9% indicated that their households had no financial obligations and 46.5% answered that they did not experience financial difficulties during the pandemic crisis. Only 23.4 percent faced temporary and long-term financial difficulties. Another 22.7 percent of respondents confessed that losing their monthly incomes they could be able to cover current expenses without borrowing for more than three months. Nearly half (47.7%), in turn, answered that they could hold only one month or less. The most financially unsecured are single-living people (53 to 62 percent), with basic education (61.4 percent). Thinking about hard times in the future, 35.7 percent of respondents consider an opportunity to start accumulating savings and 16.5 percent have already decided to do it. The survey also shows that the longer the respondent is able to survive without income, the higher probability that the respondent is among those who have decided to make savings for hard times (see Appendix A).

Under the restrictions imposed on preventing epidemic spread, household consumption decreased and unplanned savings (called forced savings) were created (Dossche & Zlatanov, 2020).

If the total Latvian household savings in commercial banks reached EUR 7.42 billion in January 2020, it grew up to EUR 8.57 billion at the end of February 2021 representing 54.6% of total resident deposits. Table 2 displays the growth of household savings during the restrictions imposed by the government: March 14 – June 9 of 2020 and November 9, 2020 – April 6, 2021.

Table 2. Household savings (2020-2021)

Indicator	2020												2021	
	01	02	03	04	05	06	07	08	09	10	11	12	01	02
Household savings (billion euros)	7.42	7.46	7.53	7.72	7.74	7.80	7.81	7.84	7.92	8.03	8.12	8.40	8.45	8.57
Changes to the previous year, %		0.7	0.9	2.4	0.3	0.8	0.1	0.5	1.0	1.4	1.1	3.4	0.7	1.4

Source: Bank of Latvia (Bank of Latvia, 2021)

In many sectors directly affected by the restrictions, the income of workers decreased, but the overall financial stability of all households has improved. A large proportion of state and local government employees continued to work and receive salary. On the other hand, households' ability to spend their income during the Covid-19 pandemic was significantly limited. Household savings and their habits of accumulating savings play an important role in the national economy as savings ensure the financial stability of households during the economic downturn (Bank of Latvia, 2009).

The survey showed that eight percent of respondents received the state emergency aid, the highest ratio of 13.5 percent is among respondents aged 45-54. Due to the COVID-19 pandemic economic activity in Latvia was limited in 2020, as a result the official unemployment rate grew rapidly from 6.3% in February to 8% in April and to 8.6% in July (Central Statistical Bureau, 2021).

In April 2020, citizens were critically interested in the opportunity to postpone principal payments, and Latvian commercial banks granted leasing and credit holidays to more than 2,550 private clients during national emergency postponing principal payments on 124.7 million euros. For example, five percent of Luminor mortgage borrowers have used the possibility of postponing credit payments (Kubliņš, 2020).

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5. Discussion

Due to the experience of the COVID-19 pandemic, part of the population has decided to save money for greater safety in the future. During the summer months of 2020, the Latvian economy slightly recovered from spring restrictions, but the virus has returned in October and the impact of various restrictions is still continuing and it is not clear what the far-reaching consequences will be in the future. The pandemic continues to affect consumer behaviour, attitude and expectations. *Kantar Group's* latest study in Latvia was conducted from 26 to 28 January 2021 surveying 800 Latvian residents aged 18 to 74. The survey data show that the national emergency situation caused by coronavirus affects 61% of Latvian residents (for comparison, in June 38%, in August 31%, in November 46%). More and more citizens feel the impact on their household income (34%) especially in the group of respondents aged 35-44 (Priedola, 2020).

More than 7,000 Latvian residents participated in the "Financial IQ test" organized by *Swedbank* for the period from 15 February to 22 March 2021. Six percent of test participants answered that they don't plan their budget at all. However, insurance is still considered as a mandatory bank requirement without binding it on family budget

security. In the context of the annual credit rate which is an important indicator of making decision on borrowing only 23% of participants marked this answer correctly. It means, households do not understand or understand only partly the role of the interest rate in the monthly payments on a loan.

A very actual question is when a person aspires to get additional knowledge: by himself or the pandemic acts as an incentive motivator. Human behaviour is much studied in the social anthropology industry, and financial activities are on of the processes of individual behaviour. As an important social aspect in the context of financial literacy, researches highlight the linkage between the causes of adult behaviour and child experience in the family (Christiansen et al., 2008; Klapper, 2013). It means that at this moment family adults, are able to influence the future behaviour of their children on financial matters, as researches note this experience will arise from a number of factors: the level of parental financial literacy, the level of family well-being (Behrman, 2010; Van Rooij et al., 2011), information from family on budgeting and savings (Webley & Nyhus, 2013).

The current results of the studies are explained by a number of prevailing global trends that have a specific impact on the current attitudes to this problem. In the *Intrum* study, approximately two-thirds (63%) of Latvian consumers believe that their education on financial matters is sufficient to manage their daily finances as 68% of consumers were able to choose correct definitions for basic financial terms. The population of any country should be familiar with the fundamentals of financial planning and be able to create a balanced private/household budget. It is a challenge to make people with low financial literacy and perhaps with reluctance to improve it at least passive supporters of financial literacy understanding its benefits. All OECD members tend to increase the level of financial literacy of their citizens by developing their national strategies where the steps of strategic approach to increase the level of financial literacy are already announced. The priority “Work and Income” of the National Development Plan of Latvia for 2021-2027 is intended to motivate citizens to manage their financial assets knowledgeably, to reduce the debt burden, and to accumulate savings more actively (Cross-sectoral Coordination Centre Republic of Latvia, 2020). In order to achieve these goals, it is intended to promote a culture of financial and savings investment by increasing financial literacy and curbing irresponsible lending. Two indicators will be used to assess this progress:

- 1) Market sophistication;
- 2) Debt service-to-income ratio (2nd quintile of netwealth).

Market sophistication is the place in the rating of Global Innovation Index. In 2019, Latvia took the 40th place of 129 countries. By 2027, Latvia is planning to move to the 21st place. Market sophistication depends on Credit, Investment and Trade, competition, and market scale. The Bank of Latvia Latvijas determines the second indicator in percentage. In 2018 (base year), it was 34.1 with a plan to reduce the value of the indicator below 30% by 2027.

6. Conclusion

Financial literacy relates to knowledge, skills and confidence in responsible financial decision-making. The aim is to stimulate people to be better acquainted with the fundamentals of financial planning and to be able to build a balanced household budget, to accumulate savings, and to be secured from potential risks in the future. People should be independent of state aid such as social benefits. For example, the mission of the Finlandian financial literacy strategy is to make people understand the role of finance in their lives and to consider the ethics in financial affairs making them sustainable in long-term perspective (Bank of Finland, 2021).

Financial expertise should be developed especially for groups at high risk of social exclusion. This study did not include any demographic characteristics describing the affiliation of respondents to any of the following groups: unemployed and job seekers, persons diagnosed as mentally disturbed or families with such persons, families in

which parents have insufficient skills in childcare, orphans who started an independent life after an orphanage, people who did not complete basic or secondary education, prisoners, elderly (with limited family support).

References

- Allianz Research (2020). Financial & Risk Literacy: Resilience in times of Corona. Retrieved March 19 2021 from https://www.eulerhermes.com/content/dam/onemarketing/ehndbx/eulerhermes_com/en_gl/erd/publications/pdf/2020_11_19_FinancialRiskLiteracy.pdf
- Niu, G., Zhou, Y., & Gan, H. (2020). Financial literacy and retirement preparation in China. *Pacific-Basin Finance Journal*, 59, 101262. <https://doi.org/10.1016/j.pacfin.2020.101262>
- Jiang, J., Liao, L., Wang, Z., & Xiang, H. (2020). Financial literacy and retail investors' financial welfare: Evidence from mutual fund investment outcomes in China. *Pacific-Basin Finance Journal*, 59, 101242. <https://doi.org/10.1016/j.pacfin.2019.101242>
- Wang, H., Zhang, D., Guariglia, A., & Fan, G. Z. (2021). 'Growing out of the growing pain': Financial literacy and life insurance demand in China. *Pacific-Basin Finance Journal*, 66, 101459. <https://doi.org/10.1016/j.pacfin.2020.101459>
- Intrum. European Consumer Payment Report 2020 Latvia. Retrieved March 15 2021 from https://www.intrum.lv/media/10205/intrum-ecpr-2020_latvia.pdf
- Lind, T., Ahmed, A., Skagerlund, K., Strömbäck, C., Västfjäll, D., & Tinghög, G. (2020). Competence, confidence, and gender: The role of objective and subjective financial knowledge in Household finance. *Journal of Family and Economic Issues*, 41(4), 626-638. <http://dx.doi.org/10.1007/s10834-020-09678-9>
- Clark, A., Jit, M., Warren-Gash, C., Guthrie, B., Wang, H. H., Mercer, S. W., ... & Jarvis, C. I. (2020). Global, regional, and national estimates of the population at increased risk of severe COVID-19 due to underlying health conditions in 2020: a modelling study. *The Lancet Global Health*, 8(8), e1003-e1017. [https://doi.org/10.1016/S2214-109X\(20\)30264-3](https://doi.org/10.1016/S2214-109X(20)30264-3)
- König, M., & Winkler, A. (2021). COVID-19: Lockdowns, fatality rates and GDP growth. *Intereconomics*, 56(1), 32-39. <https://doi.org/10.1007/s10272-021-0948-y>
- Coccia, M. (2021). The relation between length of lockdown, numbers of infected people and deaths of Covid-19, and economic growth of countries: Lessons learned to cope with future pandemics similar to Covid-19 and to constrain the deterioration of economic system. *Science of the Total Environment*, 775, 145801. <https://doi.org/10.1016/j.scitotenv.2021.145801>
- Chowdhury, E. K., Khan, I. I., & Dhar, B. K. (2021). Catastrophic impact of Covid-19 on the global stock markets and economic activities. *Business and Society*. <https://doi.org/10.1111/basr.12219>
- Greve, B., Blomquist, P., Hvinden, B., & van Gerven, M. (2021). Nordic welfare states—still standing or changed by the COVID-19 crisis? *Social Policy & Administration*, 55(2), 295-311. <https://doi.org/10.1111/spol.12675>
- Vasiljeva, M., Neskoriadieva, I., Ponkratov, V., Kuznetsov, N., Ivlev, V., Ivleva, M., ... & Zekiy, A. (2020). A predictive model for assessing the impact of the COVID-19 pandemic on the economies of some Eastern European countries. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(3), 92. <https://doi.org/10.3390/joitmc6030092>
- Heald, D., & Hodges, R. (2020). The accounting, budgeting and fiscal impact of COVID-19 on the United Kingdom. *Journal of Public Budgeting, Accounting & Financial Management*. <https://doi.org/10.1108/JPBAFM-07-2020-0121>
- Clemens, J., & Veuger, S. Implications of the Covid-19 pandemic for state government tax revenues. AEI Economics Working Papers, American Enterprise Institute. Retrieved March 5 2021 from <https://EconPapers.repec.org/RePEc:aei:rpaper:1008570714>
- Aidukaite, J., Saxonberg, S., Szelewa, D., & Szikra, D. (2021). Social policy in the face of a global pandemic: Policy responses to the COVID-19 crisis in Central and Eastern Europe. *Social Policy & Administration*, 55(2), 358-373. <https://doi.org/10.1111/spol.12704>
- Sujadi, E.; Kamil, D.; DS, M. R., Yandri, H., Juliawati, D., Fadhli, M., & Indra, S. (2020) Does COVID-19 Significantly Affect the Quality of Life? The Impact Analysis of COVID-19 on Work, Financial, Quality of Worship, Emotional and Social Aspects. Retrieved March 5 2021 from https://www.researchgate.net/profile/Hengki-Yandri/publication/344457438_Does_COVID-19_Significantly_Affect_the_Quality_of_Life_The_Impact_Analysis_of_COVID-19_on_Work_Financial_Quality_of_Worship_Emotional_and_Social_Aspects/links/5f7815b2299bf1b53e0997fe/Does-COVID-19-Significantly-Affect-the-Quality-of-Life-The-Impact-Analysis-of-COVID-19-on-Work-Financial-Quality-of-Worship-Emotional-and-Social-Aspects.pdf

- Douglas, M., Katikireddi, S. V., Taulbut, M., McKee, M., & McCartney, G. (2020). Mitigating the wider health effects of covid-19 pandemic response. *Bmj*, 369. <https://doi.org/10.1136/bmj.m1557>
- Alessie, R. J., Bucher-Koenen, T., Lusardi, A., & Van Rooij, M. (2021). Fearless Woman: Financial Literacy and Stock Market Participation, CEPR Discussion Papers. <https://doi.org/10.3386/w28723>
- Kadoya, Y., & Khan, M. S. R. (2020). Financial Literacy in Japan: New Evidence Using Financial Knowledge, Behavior, and Attitude. *Sustainability*, 12(9), 3683. <https://doi.org/10.3390/su12093683>
- Priedola, I. Kantar's COVID-19 Barometer, Retrieved March 5 2021 from <https://www.kantar.lv/tresa-dala-latvijas-iedzivotaju-33-izvelas-distancetu-attieksmi-pandemijas-krizes-parvaresanai/>
- Cude, B. J., Chatterjee, S., & Tavosi, J. (2020). Financial Knowledge, Personality Traits, and Risky Borrowing Behaviors in Iranian Households. *Sustainability*, 12(18), 7608. <https://doi.org/10.3390/su12187608>
- Lusardi, A., Hasler, A., & Yakoboski, P. J. (2020). Building up financial literacy and financial resilience. *Mind & Society*, 1-7. <https://doi.org/10.1007/s11299-020-00246-0>
- Atkinson, A., & Messy, F. A. (2012). Measuring financial literacy: Results of the OECD/International Network on Financial Education (INFE) pilot study. OECD Working Papers on Finance, Insurance and Private Pensions. <https://doi.org/10.1787/5k9csfs90fr4-en>
- Gustman, A. L., Steinmeier, T. L., & Tabatabai, N. (2012). Financial knowledge and financial literacy at the household level. *American Economic Review*, 102(3), 309-13. <https://doi.org/10.1257/aer.102.3.309>
- Fernandes, D., Lynch Jr, J.G., & Netemeyer, R.G. (2014) Financial literacy, financial education, and downstream financial behaviors. *Management Science*, 60(8), 1861-1883. <https://doi.org/10.1287/mnsc.2013.1849>
- Lind, T., Ahmed, A., Skagerlund, K., Strömbäck, C., Västfjäll, D., & Tinghög, G. (2020) Competence, confidence, and gender: The role of objective and subjective financial knowledge in Household finance. *J. Family Econ.* 41, 626–638. <http://dx.doi.org/10.1007/s10834-02009678-9>
- Adams-Prassl, A., Boneva, T., Golin, M., & Rauh, C. (2020). Inequality in the impact of the coronavirus shock: Evidence from real time surveys. *Journal of Public Economics*, 189, 104245. <https://doi.org/10.1016/j.jpubeco.2020.104245>
- Barrafrem, K., Västfjäll, D., & Tinghög, G. (2020) Financial well-being, COVID-19, and the financial better-than-average-effect. *Journal of Behavioral and Experimental Finance*, 28, <https://doi.org/10.1016/j.jbef.2020.100410>
- Central Statistical Bureau. GDP has fallen by 3.6 % in 2020 and by 1.5 % in the 4th quarter. Retrieved March 1 2021 from <https://www.csb.gov.lv/lv/statistika/statistikas-temas/ekonomika/ikp/meklet-tema/2942-iekaszemes-kopprodukts-2020-gada>
- Central Statistical Bureau. At-risk-of-poverty threshold, illustrative values (euro per year) by Household's type and Time period. Retrieved March 15 2021 from https://data.stat.gov.lv/pxweb/lv/OSP_PUB/START_POP_NN_NNR/NNR010/table/tableViewLayout1/
- Sheth, J. (2020) Impact of Covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research*, 117, 280-283. <https://doi.org/10.1016/j.jbusres.2020.05.059>
- Bank of Latvia. Retrieved 17 March 2021 from <https://datnes.latvijasbanka.lv/maksajumu-statistika/maksajumu-parskats-2020.pdf>
- Central Statistical Bureau. 29.3 % of households did not have any savings at the beginning of 2020. Retrieved 1 March 2021 from <https://www.csb.gov.lv/lv/statistika/statistikas-temas/socialie-procesi/nabadziba/meklet-tema/2834-293-majsaimniecibu-2020-gada-sakuma-nebija>
- Finance Latvia Association. A quarter of the Latvian population has no savings for a white day. Retrieved 1 March 2021 from <https://www.financelatvia.eu/news/ceturtdalai-latvijas-iedzivotaju-nav-nekadu-uzkrajumu-nebaltai-dienai/>
- Luminor bank. Survey: 34% of Latvians during the pandemic have made it clear that they can spend less on. Retrieved 10 March 2021 from <https://www.luminor.lv/lv/jaunumi/aptauja-34-latvijas-iedzivotaju-pandemijas-laiks-lcis-saprast-ka-ikdienu-var-teret-mazak>
- European Central Bank. Financial wealth of euro area households. Retrieved 12 March 2021 from <https://www.euro-area-statistics.org/statistics-insights/financial-wealth-of-euro-area-households?cr=eur&lg=en&page=0>
- Dossche, M.; Zlatanos, S. (2020) COVID-19 and the increase in household savings: precautionary or forced? *Economic Bulletin Boxes*, 6. <https://EconPapers.repec.org/RePEc:ecb:ecbbox:2020:0006:5>
- Bank of Latvia (2021) 03 Deposits raised by MFIs and MFIs Liabilities to MFI (excluding central bank; starting with data for December 2014). Retrieved 11 March 2021 from <https://statdb.bank.lv/lb/Data/229>
- Bank of Latvia (2009) Savings in Latvia. Retrieved 12 March 2021 from https://www.bank.lv/public_files/images/img_lb/izdevumi/latvian/citas/diskusij_mater/dm_2009-1.pdf

Central Statistical Bureau. Unemployment rate in January 2021. Retrieved 11 March 2021 from <https://www.csb.gov.lv/en/Statistics/Covid19/Unemployment-rate-in-January-2021>

Kubliņš, I. (2020) Credit holidays in the COVID-19 crisis - what do the largest commercial banks in Latvia offer? Retrieved 15 January 2021 from <https://www.plz.lv/kreditbrivdienas-covid-19-krize-ko-piedava-latvijas-lielakas-komerbankas/>

Christiansen, C., Joensen, J.S., & Rangvid, J. (2008) Are economists more likely to hold stocks? Review of Finance, 12(3), 465-496. <https://doi.org/10.1093/rof/rfm026>

Klapper, L., Lusardi, A., & Panos, G. A. (2013) Financial literacy and its consequences: Evidence from Russia during the financial crisis. Journal of Banking & Finance, 37(10), 3904-3923. <https://doi.org/10.1016/j.jbankfin.2013.07.014>

Behrman, J.R. (2010) Investment in education—inputs and incentives. Handbook of development economics, 5, 4883-4975. <https://doi.org/10.1016/B978-0-444-52944-2.00011-2>

Van Rooij, M., Lusardi, A., & Alessie, R. (2011) Financial literacy and stock market participation. Journal of Financial Economics, 101(2), 449-472. <https://doi.org/10.1016/j.jfineco.2011.03.006>

Webley, P., & Nyhus, E.K. (2013) Economic socialization, saving and assets in European young adults. Economics of Education Review, 33, 19-30. <https://doi.org/10.1016/j.econedurev.2012.09.001>

Cross-sectoral Coordination Centre Republic of Latvia. National Development Plan of Latvia for 2021-2027. Retrieved 11 January 2021 from https://www.pkc.gov.lv/sites/default/files/inline-files/20200204_NAP_2021_2027_gala_redakcija_projekts_.pdf

Bank of Finland. Proposal for a national strategy to promote financial literacy in Finland. Retrieved 19 March 2021 from <http://urn.fi/URN:NBN:fi:bof-202101271069>

Appendix A

Table A1. Respondents' answer: Belong to risk group

Indicator	All respondents	By gender		By age					
		Male	Female	18 - 24	25 - 34	35 - 44	45 - 54	55 - 63	64 - 75
Belong to risk group	23.7	20.3	26.8	1.9	4.1	7.5	19.7	39.6	64.8

Table A2. During the covid-19 pandemic, people were asked to limit the frequency of going to shops and make more purchases on the Internet. Compared to the situation before the Covid-19 pandemic, how have your shopping habits changed?

Possible answers	Total	Among those at risk
I visit shops less frequently, but I don't go shopping more frequently on the Internet	38.5	45.7
I visit shops less frequently preferring home-delivery purchases	9.3	5.5
Nothing changed, I visit shops as usual	49.9	47

Table A3. Compared to the situation before the Covid-19 pandemic, how have your shopping habits changed?

Indicator	No changes in shopping habits	No changes in the habits of settlement
All respondents	49.9	53.5
Male	52.6	58.7
Female	47.5	48.6
18 - 24 years old	54.8	56.3
25 - 34 years old	51.5	50.9
35 - 44 years old	46.9	49.8
45 - 54 years old	47.6	52.7
55 - 63 years old	46.5	57.2

64 - 75 years old	55.5	56.5
Married or living with a partner	47.0	49.5
Divorced or living separately from a partner	50.7	59.7
Unmarried	54.6	57.7
Widower/widow	59.4	62.8
Basic education	59.4	68.5
Secondary or professional education	50.1	54.5
Higher education	45.8	44.8
Low income (up to 249 Eur)	53.8	60.1
Middle-low income (250 Eur - 310 Eur)	53.8	60.4
Middle income (311 Eur - 430 Eur)	50.3	57.4
High-middle income (431 Eur - 600 Eur)	50.3	47.4
High income (601 Eur and more)	45.5	45.8
Don't know	45.1	50.6

Table A4. During the Covid-19 pandemic, have you/your household experienced difficulties in settling past financial commitments (e.g. credit, leasing, billing)?

Possible answers	Total	Among those who received aid
Households without financial obligations	26.9	23
No trouble occurred	46.5	46.3
Yes, there were short-term troubles	17.3	23.3
Yes, there were long-term troubles	6.1	7.4

Table A5. Compared to the situation before the Covid-19 pandemic, how has your working load changed overall?

Possible answers	Total	Among those who worked remotely
Decreased	12.7	18.3
Increased	12.3	19.5
Not changed	69.1	59.5

Table A6.

Compared to the situation before the Covid-19 pandemic, your household income is ...?

Compared to the situation before the Covid-19 pandemic, how has your household expenditure changed?

During the Covid-19 pandemic, have you/your household experienced difficulties in settling past financial commitments (e.g. credit, leasing, billing)?

If you lose your monthly income, how long would you be able to cover your current expenses without borrowing?

In the light of the experience of the Covid-19 pandemic, have you decided to accumulate savings for greater security in the future?

Compared to the situation before the Covid-19 pandemic, how have your habits changed when shopping?

	Income decreased	Expenditures decreased	Difficulties in settling liabilities	Reserves for one month or less	Haven't thought about creating reserves	Banking services are more used for settlements
All respondents	26.1	17.3	23.4	47.7	41.0	33.3
Male	27.1	17.2	23.2	43.3	41.7	28.9
Female	25.1	17.3	23.5	51.8	40.3	37.4
Aged 18 - 24	29.3	19.2	26.4	42.7	43.1	32.6
Aged 25 - 34	29.6	18.0	27.3	47.9	37.2	37.8
Aged 35 - 44	33.3	18.5	26.2	50.2	38.6	37.7
Aged 45 - 54	29.2	17.8	24.9	48.0	38.9	37.2

Aged 55 - 63	25.1	21.7	19.7	41.9	41.3	29.9
Aged 64 - 75	9.0	8.8	16.1	52.8	49.3	22.4
Married or living with a partner	26.7	16.9	22.1	44.6	39.9	38.3
Devorced or living separately from a partner	25.3	16.2	29.2	53.6	44.3	25.8
Unmarried	27.9	20.7	24.2	46.6	39.3	28.5
Widower/widow	19.3	14.9	22.0	62.1	46.6	20.2
Basic education	18.1	13.3	24.2	61.4	58.7	14.3
Secondary or professional education	27.2	17.4	24.3	50.7	40.5	30.1
Higher education	26.6	18.7	20.8	34.8	34.9	48.8
Low income (up to 249 Eur)	25.0	12.4	27.8	75.8	55.8	20.9
Middle-low income (250 Eur - 310 Eur)	24.0	15.7	21.5	52.8	45.6	27.6
Middle income (311 Eur - 430 Eur)	21.9	19.7	23.7	48.2	42.0	29.9
High-middle income (431 Eur - 600 Eur)	26.4	19.3	26.2	38.7	35.1	39.9
High income (601 Eur and more)	26.4	14.2	20.0	29.5	29.3	44.6
Don't know	33.2	21.3	19.7	41.5	38.5	36.6

Table A7. If you lose your monthly income, how long would you be able to cover your current expenses without borrowing?

Possible answers	Total	Among those who decided to accumulate savings for bad times
Less than 1 month	24.8	7.1
1 month	22.9	12.6
2 months	17.3	20.2
At least 3 months	13.9	30.0
At least 6 months	8.8	31.7

Table A8. In the light of the experience of the Covid-19 pandemic, have you decided to accumulate savings for greater security in the future?

Possible answers	Total	Among those who agree that state benefits should be much higher
I haven't thought about it	41.0	39.4
I consider this opportunity	35.7	38.4
I have decided to do it	16.5	16.5
No comments	6.9	5.7

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ADDED VALUE IN THE TRANSPORT SECTOR AT THE TIME BEFORE COVID-19 PANDEMIC: A COMPARISON OF THE EU COUNTRIES

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Abstract. The COVID-19 pandemic has had a significant impact on the generation of added value within national economies. Generation of added value in the transport sector is an important factor in manufacturing products and providing services in the environment of the national economies. The globalisation of production has made the transport sector one of the main sectors enabling and accelerating the process of generating added value in all other sectors. The objective of the contribution is to determine which EU-28 countries made the most effective investments in research and development (R&D) in order to achieve the highest possible value added of the state within the transport sector in the years 2012-2017. For the purposes of the analysis, regression model and the method of artificial neural networks were used. Our research identified a high differentiation in terms of the volume of investments in R&D participating in the creation of added value in the transport sector. The results of the analysis identified the EU-28 member states which achieved the optimal share of investments made in R&D and generated added value in the monitored period. Since each country has its priorities related to its goals and geographical location, the determined optimum is only indicative value of investment for a specific country but not a recommended value for all other states.

Keywords: added value; investments in research and development; transport sector; COVID-19

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JEL Classifications: F21, O32, L91

1. Introduction

Globalisation of production and services has broken the value chain between several countries or even continents (Foundation Robert Schuman, 2016). The European continent is still a patchwork of national transport systems which aim to overcome the differences to ensure the competitiveness of European countries (Purwanto et al, 2017). The transport infrastructure in all 28 countries in the European Union (EU28; EU 27 since the year 2020) has shown rapid development in the last decade, and the impact of transport on sustainability, development, and economic growth has become an interesting issue for policy-makers as well as economists or entrepreneurs (Cigu et al, 2019). The dynamics of the economic development is very diverse (Yun & Won & Park, 2018) and the growth and development strategies are becoming more sophisticated, economically transforming them-selves to creating products and services with a higher added value. This goal is achieved through R&D related activities, which increase innovation growth and positively influence the productivity, thus providing a platform for sustainable development (Danileviciene & Lace, 2017) which is an important prerequisite for growth and development (Yun & Yigitcanlar, 2017).

The transport sector is a backbone of the economy (Gherghina et al, 2018) which includes a complex network of ca. 1.2 million private and public companies within the EU and ensures the supply of goods and services to EU citizens and companies. Transport is a strategic sector of the EU economy, which directly influences the everyday life of EU citizens and ensures their mobility, thus contributing to the free movement of persons within the internal European market (AndSoft, 2018). Road transport in the EU is not characterized by mobility only; there is also a factor of business competitiveness (Foundation Robert Schuman, 2016), since the availability, price, and quality of transport services have a significant effect on production processes and selection of business partners (AndSoft, 2018).

Global competition is a benefit for European supply chains (Bentyn, 2019). An example is a dominance and relative competitiveness of carriers in new developing EU countries (Poland, Bulgaria, Croatia, and Romania) caused by their high share (80 %) of the overall cross-border trade within Europe. On the other hand, it seems that carriers from the developed countries, such as Sweden, France, Italy, Belgium, and Denmark are less competitive and show a relatively low market share in terms of export and import within their own economies (AndSoft, 2018). This is caused by economic factors which are reflected in different costs of labour within the EU member countries. Experts point to the fact that the entities in the transport sector participating in the global value chain (GVC) are not individual countries but individual companies (Vrh, 2018).

In addition to its advantages, globalization of the transport sector has also several shortcomings. When the European Union realized the impacts and threats the rapid development of road transport poses for the environment, a new principle of “modal shift” was accepted in the White Paper on the future development of the common approach (Foundation Robert Schuman, 2016). The above principle is considered the main challenge in the European transport strategy, and besides mitigating the environmental impacts, it ensures increasing competitiveness of the EU countries by means of creating a system supporting the European economic progress and providing high-quality services within the mobility while effectively using the resources (Purwanto et al, 2017).

To meet the challenge in the White Paper, another priority of the EU is to create the conditions for effective innovations essential for the logistics industry (Gong at al, 2019). Innovations in logistics represent significant advantages for enterprises, such as accelerating the purchasing process, reduction of storage or transportation costs, timely delivery of goods or material, reduction of the workforce, improvement of safety and precision (Tabatabaie & Nik, 2016). The sup-port of innovations by means of investments in the transport infrastructure accounts ap-prox. for 25 % of the EU public investments (Dijkstra & Poelman & Ackermans, 2018), which makes the given sector the most expensive and important within the European supply chain (Gavric & Miloloza, 2017).

Another priority of the European Commissions is to close the investment gap in Europe, e.g. by means of launching new investment projects in the transport sector (Rackowski & Schneider & Laroche, 2017).

The COVID-19 crisis has shown that everything in today's world is interconnected, as confirmed by the fast spread of the virus, and that it is interconnected also in terms of delivering products. This interconnection in logistics as a part of the transport sector is expected to grow in the future (Liu et al, 2020). Trading in raw materials is thus dependent on the ability to manage the logistics chain between various production plants according to fluctuating prices. This explains why trades increasingly more often invest in transport and warehouse infrastructures in order to adapt their logistic strategies to real-time logistics (Foundation Robert Schuman, 2016). In the near future, by the year 2028, global logistic organizations will be pushed to "innovate or die" and instead of vertical growth, they will focus on creating goods using spin-off technology (Suberg, 2018). Industry 4.0 should initiate significant changes in technologies, business, and enterprises, where logistics as an entrepreneurial activity is not an exception (Čámská & Klečka, 2015).

The value chain of companies influences and is influenced many societal issues (Yun & Yigitcanlar, 2017). The common European market needs competitive transport systems to structure the value chain, which can be achieved by applying innovative solutions (Eremina & Lace & Bistрова, 2019). The modernization of all modes of transport needs to be focused, without any exception, on competitiveness and creating innovative ecosystems, modernization, optimization, and maintenance of the existing systems rather than on extending the existing networks.

However, as it is not possible to implement only a single solution across Europe (Foundation Robert Schuman, 2016), the objective of the contribution is to determine to which extent the investment in research and development participate in the creation of the added value within the transport sector in all EU28 countries in the years 2013 - 2017.

2. Theoretical background

In the transport sector, there is an obvious reason for its slow development, which is insufficient investment in innovations. The individual European countries at the regional and national level and EU level try to contribute to R&D by means of new innovations as well as improving the control of effectiveness of investments in realized or current projects. Researchers from all over the world participate in verifying the existing and searching for new statistical methods applicable for verifying how investments in a specific sector have contributed to creating competitiveness and generating added value for the given sector.

Purwanto et al (2017) examined the relationship between investments in transport infrastructure and their wide economic effect on competitiveness and economic growth using the cost-benefit analysis (CBA). Based on the research results, the authors concluded that in terms of the relationship between transport and the target market, in the case of the target market non-competitiveness, the EU project will have only a negative impact on the efficiency of the given market.

Stawicki (2018) compared the investment made in the transport infrastructure with the support of the EU structural funds in selected countries (Latvia, Lithuania, Poland) in the years 2007 - 2013. Using a descriptive method of relative and absolute ratios, the author concluded that in the monitored period, the most financial resources from the EU funds were drawn by Poland (approx. 30 billion EUR), while the overall value of all projects supporting transport infrastructure in Latvia and Lithuania were very similar (1,7 billion EUR). By the number of inhabitants, Latvia made the most investments (865 thousand EUR per capita). Based on other results, the author points out that the support of the EU structural funds intended for the development of the transport infrastructure enabled to increase the territorial cohesion of the EU in the analysed region.

Gherghina et al (2018) examined the relationship between the main modes of transport, related investment, and sustainable economic growth in the territory of the EU28 in the years 1990 - 2016. According to the Granger causality test with the error correction model, the research has shown a short-term one-way link of the volume of goods transported by air and gross domestic product per capita (GDPC). In terms of the investments in transport, the authors identified the relationship of a short-term development caused by the investments in the road transport infrastructure and inland waterways and GDP.

Melecký (2018) investigated the effectiveness of financing the infrastructure in the EU countries between 2007 and 2013 using efficiency analysis. The results show that most countries with a lower volume of investments show higher efficiency, especially the countries in the group of the so-called “old member states” (EU-15).

Vlahinic Lenz et al (2019) empirically examined the impact of transport infrastructure on the economic growth of Central and Eastern European EU Member States (CEMS) in the years 1995 - 2016 using panel analysis. The results of their research indicate a long-term non-efficient and obsolete railway infrastructure. Railway infrastructure is an ecologic solution, as railway transport is the eco-friendlies mode of transporting goods in terms of increasing competitive advantage and economic growth in the CEMS.

Some studies were focused on comparing the investments made in the transport sector in terms of the comparison of the public and private sectors. According to the results of the study realized by PwC in 2016, the public sector made low investments in start-ups. Between 2011 and 2015, private companies invested approximately 30 million USD annually in digital logistic start-ups, while the public logistic sector invested less than 2 million USD annually in logistic start-ups (Suberg, 2018). Rokicki et al (2021) also examined the impact of regional investments in the infrastructure on the example of Poland using the application of the TERM model. The results of their research point to the big difference between the regions with the high share of investments made by private investors and the regions that rely fully on public funding.

When analysing the studies focused on comparing investments made in the private and public sector, it can be seen that the public transport companies do not invest in innovations as much as other industries for many different reasons, such as inadequate belief in centuries-old traditions and obsolete economic principles.

Andersson & Forslund (2018) aimed to find and interpret possible determinants of logistic innovations and explain innovative activities of a company in the sectors of road transport and logistics in comparison with other industries in the Czech Republic between 2008 and 2014. The given period includes the period of the economic crisis in 2008. The authors pointed out that the Czech Republic, for its geographical location in the centre of the European Union, is a strategic option for multinational companies also due to the fact that compared to highly developed countries, such as Germany or Austria, it has lower staff costs or rent expenses. The results of their research indicate the existence of a negative relationship between innovation decisions and industry in road transport or logistics. For the purposes of the research, the authors developed an indicator for measuring sustainable logistic innovation (SLI), which identifies innovative ratios and provides a method for their measurement with the dimensions of sustainability and logistic activities. During the period under review, the only statistically significant positive determinant of logistic innovation was in the case of foreign ownership.

Cigu et al (2019) examined the relationship between the transport infrastructure and economic performance of the EU28 countries between 2000 and 2014. Using the panel analysis of data, the authors examined the impact of transport infrastructure on economic growth as well as on the role of policy-makers within the EU explaining the differences between the EU member states. The results show that the improvement of transport conditions in the EU countries plays an important role in sustaining the economic growth of the national economies.

Studies that examined investments in the transport sector focused on the impact of the given industry on the competitiveness and sustainable economic growth of countries using the cost-benefit analysis (CBA) (Purwanto et al, 2017). Granger causality (Gherghina et al, 2018) and panel analysis (Cigu et al, 2019; Vlahinić-Lenz & Pavlič-Skender & Mirković-Adelajda, 2019). Other studies compared the investments in the transport sector made by private, public (Suberg, 2018), and regional sectors using the application of the TERM model (Rokicki et al, 2021). In terms of the explanation of the innovative activities and interpretation of the possible determinants of logistic innovations, the authors developed an SLI indicator (Andersson & Forslund, 2018). Other authors dealt with determining the effectiveness of funding infrastructure in the EU countries by means of efficiency analysis (Melecký, 2018). Other researchers compared investments made in the transport infrastructure with the support of EU structural funds using the descriptive method of relative and absolute indicators (Stawicki, 2018).

The issue of the effectiveness of investments made is a frequently researched topic; however, none of the studies has focused on determining the impact of investments made in R&D on the added value of a specific state and the EU as a whole. Within the given contribution, one research question is formulated: What is the optimal ratio between the added value and investments? By answering this question, it is possible to determine which EU28 countries use investments in R&D most effectively to achieve the highest possible added value of the state in terms of transport.

3. Research objective and methodology

The objective of the contribution is to use the analysis of added value and investments made in research and development to determine to which extent the investments in research and development participated in the creation of added value in the transport sector in all EU28 countries between 2013 and 2017. Using the research question, we will determine the ideal ratio between the added value and investments. The analysis is performed using the regression model, which enables avoiding extreme values. For the analysis, the statistical data on investments made in research and development in the transport sector of the 28 countries of the EU and the data on generating added value in these countries on the basis of the European Commission's statistics in the years 2013 - 2017:

- 1) Data on the investments in research and development within the transport sector of the EU28 countries were obtained from the publicly available Eurostat data (Eurostat, 2020).
- 2) Data on the added value within the EU countries were obtained from the Euro-stat-OECD entrepreneurship indicator programme (OECD-Eurostat, 2020).

The research dataset includes a total of 57,967 enterprises (of all size categories) operating in the transport sector from the whole European Union. For the statistical calculations, the Statistica software, version 13.0 is used. The relationship of added value and investments in R&D is analysed using a selected tool – the method of artificial neural networks. The given method is used for prediction and controlling the processes, and adaptation of linear and non-linear functions (Didych et al, 2018). The method of artificial neural networks consists of a set of neurons (Russell & Norvig, 2020) interconnected by means of weights (Ledesma et al, 2020). The input data for the training of the neural networks will be the data on investments in R&D in the transport sector within the EU28 countries. In the training, the weights are adjusted so that each input is assigned an output with the closest possible output value (Masters, 2019) after training. In our case, basic multilayer perceptron networks are used (hereinafter referred to as MLP), which represent the basic type of neural networks, and radial basis function networks (RBF) based on the logic phases. The output of the training of these networks is predictive data on investments made in R&D in the transport sector.

The analysis of the input data in the Statistica software used the tool of Data mining – neural networks, specifically General Regression. When selecting the data, the investments made in R&D are an independent variable, while the added value is a dependent variable. The above data are divided in the ratio 85:15, which is the

ratio between the training and validation datasets. The more data are used for training, the more precise the calculation will be. The analysis performed provides the basic characteristics of the input data, i.e. the statistical information on investments made in research and development and the added value, which are presented in Table 1 below.

Table 1. Basic statistics of input data

Statistics	VA Total transport	Investment transport
Minimum (Train)	405.9	4.54
Maximum (Train)	111423.2	58493.50
Statistics	VA Total transport	Investment transport
Mean (Train)	20019.5	4215.71
Standard deviation (Train)	28734.3	10218.04
Minimum (Test)	767.3	11.56
Maximum (Test)	103634.0	53359.10
Mean (Test)	22476.3	5401.50
Standard deviation (Test)	31488.0	12431.13
Minimum (Overall)	405.9	4.54
Maximum (Overall)	111423.2	58493.50
Mean (Overall)	20388.0	4393.58
Standard deviation (Overall)	29037.7	10529.60

Source: Authors

The results of the research obtained on the basis of the analysis performed are graphically represented using the scatter plot, where the states which have achieved the optimal level of investments made in R&D are marked.

Results and discussion

In accordance with the above-mentioned procedure on the training dataset, the neural networks that best describe the relationship between the independent and dependent variable were found. Out of the 10,000 generated neural structures, 5 with the best performance were retained. The hidden layer of the MLP networks contained 2-20 neurons, in the case of RBF networks, it was 11-30 neurons. For the activation of the internal neural network, the Logistic, Gaussian, Tanh functions were considered; the output layer of the neurons was activated using the functions of Identity and Sine. Using regression analysis, the Statistica programme randomly selected 5 neural networks out of 1000 neural networks depending on their performance, as seen in Table 2 below.

Table 2. Most successful neural networks

Index	Network title	Trainin g perf.	Test perf .	Training error	Test error	Training algorithm	Error function	Hidden activation	Output activation
1	MLP 1-2-1	0,9	1,0	43863395	19208022	BFGS 54	SOS	Logistic	Identity
2	RBF 1-22-1	1,0	1,0	35552131	22488084	RBFT	SOS	Gaussian	Identity
3	MLP 1-2-1	0,9	1,0	40804082	23231403	BFGS 71	SOS	Logistic	Identity
4	RBF 1-20-1	1,0	1,0	34898010	22406600	RBFT	SOS	Gaussian	Identity
5	MLP 1-6-1	1,0	1,0	39464654	23580903	BFGS 83	SOS	Tanh	Sine

Source: Authors

In these selected neural networks, the programme calculated the basic statistics of the prediction, as seen in Table 3.

Table 3. Basic statistics of investment predictions

Statistics	Predictions statistics. Target: Investment				
	1.MLP 1-2-1	2.RBF 1-22-1	3.MLP 1-2-1	4.RBF 1-20-1	5.MLP 1-6-1
Minimum prediction (Train)	5861.7	1043.8	4109.4	228.3	3810.9
Maximum prediction (Train)	98694.7	111008.7	101681.8	108734.4	100236.6
Minimum prediction (Test)	5868.4	1155.6	4130.9	724.9	3846.8
Maximum prediction (Test)	98694.7	107144.7	101681.8	105036.0	100050.2
Minimum residual (Train)	-21912.8	-22563.7	-18066.4	-23665.3	-22009.9
Maximum residual (Train)	28823.8	29371.3	27182.3	27091.8	26225.6
Minimum residual (Test)	-7372.2	-14266.7	-8157.1	-7395.0	-7297.7
Maximum residual (Test)	19175.6	14938.3	20792.8	19147.4	20963.4
Minimum standard residual (Train)	-3.3	-3.8	-2.8	-4.0	-3.5
Maximum standard residual (Train)	4.4	4.9	4.3	4.6	4.2
Minimum standard residual (Test)	-1.7	-3.0	-1.7	-1.6	-1.5
Maximum standard residual (Test)	4.4	3.2	4.3	4.0	4.3

Source: Authors

The relationship between the PH and the basic statistics of investment predictions for R&D based on Table 3 is presented in Figure 1. The selected neural networks (MLP and RBF) in the Figure indicate the point where the individual EU28 member states are located in the prediction of the optimal level of investments in R&D in the transport sector.

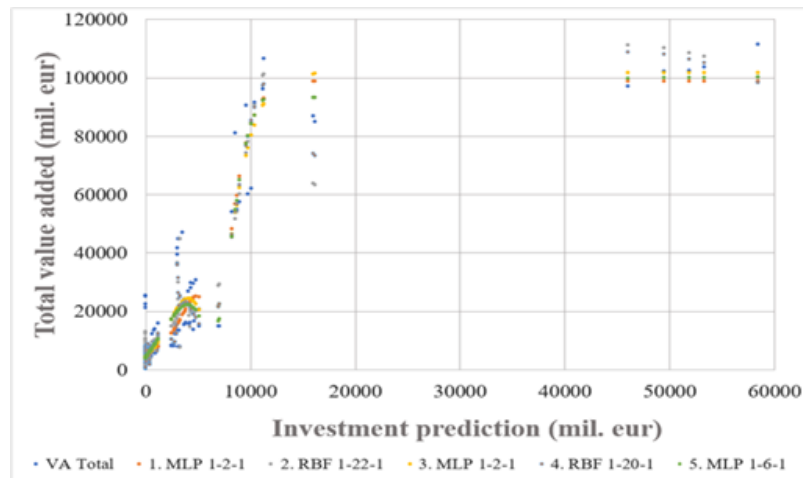


Figure 1. Relationship of VA and investments in R&D

Source: Authors

The neural networks in Figure 1 selected by the Statistica programme were divided and graphically represented in Figures 2 – 6 separately for better understanding according to each neural network. The actual values of the ratio between the investments and added value achieved by the EU states in the monitored period are marked blue in the Figures, while the predicted values calculated by the Statistica programme are marked orange. All data are given in EUR million.

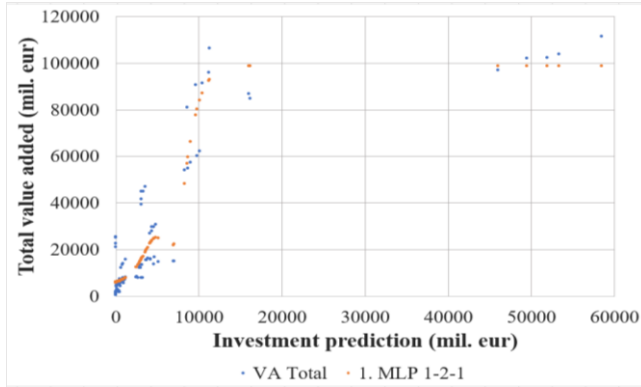


Figure 2. Neural network № 1. MLP 1-2-1

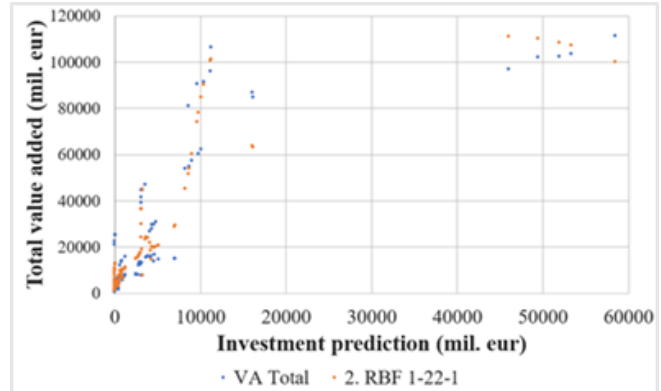


Figure 3. Neural network №2. RBF 1-22-1

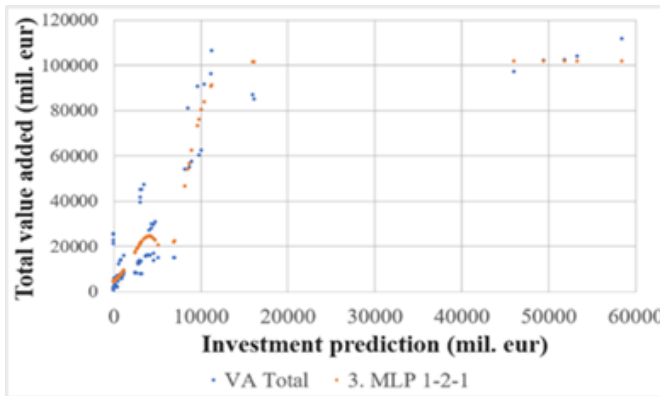


Figure 4. Neural network № 3. MLP 1-2-1

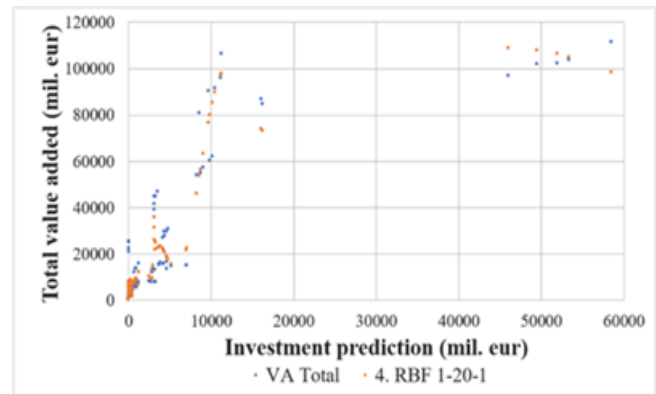


Figure 5. Neural network № 4. RBF 1-20-1

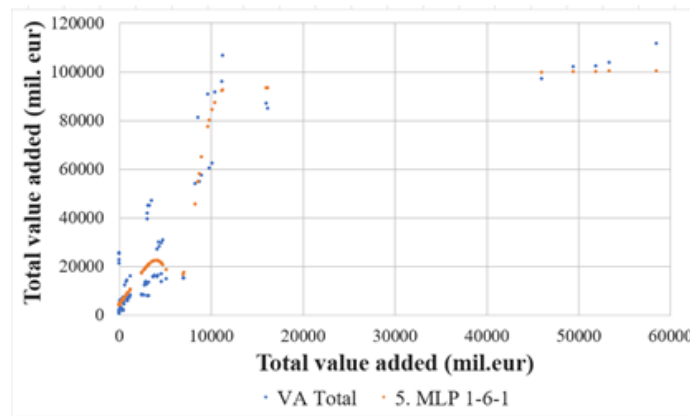


Figure 6. Neural network № 5. MLP 1-6-1

Source: Authors

Subsequently, the suitability of the selected method (regression analysis using neural networks) were verified and the most successful neural network, which provides the most accurate description of the given method logic, was selected. The aforementioned neural networks with the best performance according to the Statistica programme and presented in Figures 2-6 confirm the basic function of training using regression analysis of the neural

networks, confirm the suitability of the method, and provide evidence that the tested network does not suffer from overfitting. This means that there was no underfitting of the model, where the statistical training model is not able to capture the basic corresponding data structure.

Furthermore, when comparing the predictive statistics with the real data provided by the five neural networks, we are searching for the model of neural network which will be the most efficient, i.e. where the actual and predicted values overlap.

The searched points on the axes (x, y) are the highest residual values closest to (0, max) on the graph. These are the points where the lowest waste of investments in R&D in the selected sector.

Based on the analysis performed, neural network №2 was selected, which is considered to be the most successful (see Figure 7 below). The names of the EU member states are in accordance with the international classification of states (Intrast EU, 2019).

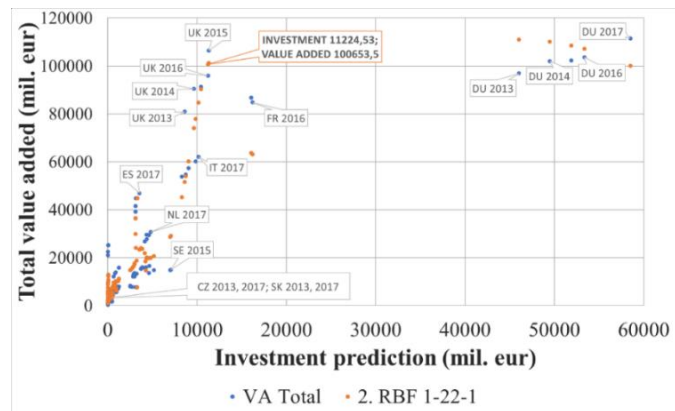


Figure 7. Selected neural network №2. RBF 1-22-1

Source: Authors

In the analysis of the most successful neural network №2, it was found that the most efficient ratio of investments in research and development in the transport sector is achieved at the level of investments of 12,000 mils. EUR. In terms of the efficiency of the investments made, it was the United Kingdom that achieved the optimal values in the year 2015.

On the basis of the results obtained, it was possible to answer the research question: What is the optimal ratio between the added value and investments in the transport sector of the EU28 countries?

The optimal ratio of investments in research and development in the transport sector was achieved at the level of investments of 12,000 mils. EUR. The country closest to the given optimum was the United Kingdom, whose investments in R&D in 2015 achieved 11,299.81 mils. EUR, while the generated value added achieved 106,374.4 mils. EUR. The values predicted by the Statistica programme were as follows: the level of investments in R&D was 11,224.53 mils. EUR, the related value added generated was 100,653.5 mils. EUR. Brexit (the United Kingdom leaving the EU) in 2020 meant that the European Union lost one of its member states as well as the second-largest value-creator in the European trade.

According to the analysed data, another country that has managed to get closer to the optimum is France, geographically situated close to the United Kingdom, which operates regular ferry service to the British Islands.

In terms of the transport sector, Germany is the country which generates the highest added value; however, compared to the UK, it invests 4 times more money while achieving only 9% higher added value. Higher investments in the given state are connected with advanced technological development but also with high wage and tax costs. Nevertheless, despite the highest achieved value added, the level of investments in Germany is 4 times less optimal than in the case of the UK.

All EU member states can be divided into three groups according to the generated value added in the transport sector within the monitored period (2013 – 2017): states with low added value (0 – 4 000 mils. EUR), medium added value (4 000 – 8 000 mils. EUR) and high added value (8 000 – 12 000 mils. EUR).

In the monitored period, the Czech Republic increased the generated added value from 5702.4 to 7061.3 mils. EUR; in the Slovak Republic, it was the increase from 2508.6 to 2760.0 mils. EUR. These insignificant improvements rank the Czech Republic and Slovakia among the countries with a low generation of added value. The comparison of the EU28 countries showed big differences in generating added value in the member states. As part of the research, it was possible to determine to what extent the generated added value of the given state is dependent on the size of enterprises. Large enterprises created the most added value for their state in all EU28 countries under review.

This research builds on the previous research (Kostiuk & Korená, 2020), where the authors compared the impact of investments in R&D on the added value of the EU28 in the sectors of construction and manufacturing. The results of their research indicate that in the construction sector, the optimum was achieved by Great Britain by investing 11.3 billion EUR, while in the manufacturing sector, it was France with the level of investments of 11.42 billion EUR.

The method of regression analysis using neural networks corresponds with the proposed model; it was able to make a precise prediction of the given values (the share of investment and added value) in the future. Since no computer technology is able to precisely predict a possible financial, ecological, or health crisis, even the method of neural networks is not able to make predictions with 100% accuracy.

Therefore, a question arose in the research on the accuracy with which the method of regression analysis is able to predict the development of added value e.g. during the COVID-19 pandemic and in the period after the pandemic. By answering the research question, it would be possible to verify the accuracy of predictions made by the Statistica programme for periods of crisis.

Conclusions

Mobility is a basic principle of the European transport policy. Transport services account for up to 4.3 % of the added value in the EU (European Commission, 2019).

Evaluation of the objective achieved. The objective of the contribution was to determine to which extent the investment in research and development participated in generating the added value of the EU28 countries in the transport sector between 2013 and 2017. The objective formulated was achieved using the method of regression analysis of neural networks. The selected method enabled us to find the optimal value in the share of the investments made and generated value added of the EU countries. Based on the results of the method used, it was concluded that the optimal share of the investments in research and development in the transport sector was achieved at the level of investments of 12,000 mils. EUR. The best results in terms of the effective use of investments were achieved by the United Kingdom in the year 2015, when investing 11,299.81 mils. EUR generated the value added of 1299.81 mils. EUR.

Limitations of the research. When trying to achieve the objective formulated, we encountered the problem of missing statistics of some countries as well as delayed publishing of the Eurostat data. It is assumed that the EU countries use the same methods for calculating the statistical data on the investments in R&D and added value. The limitation of the applicability of the results can be the fact that each country has different priorities in terms of transport, which is related to its objectives and geographical location; the optimum found is thus an indicative optimum for investments in a specific country, not a general recommendation for all other states.

Applicability in practice. In practice, the results of this research will be beneficial for the individual states in terms of comparing their competitiveness in the global market with the generated value added. The outputs of the research will be applicable also in investment budgeting of companies in R&D in the transport sector in order to ensure the model of sustainable mobility of the European transport sector. The given research will also help researchers dealing with the field of transport, R&D investments, and added value of the EU states.

Further research. The potential of the given topic for further research is confirmed also by the fact that the verified method of regression analysis using neural networks is able to predict the future development of the added value of the countries with relatively high accuracy. Further research in this field could verify the accuracy of the predictions made using this method concerning the development of added value in times of crisis (e.g. in the case of financial or health crisis caused by the COVID-19 pandemic and in the aftermath of the pandemic). The transport sector, in relation to the closure of the economy, restricted movement and travelling of persons during the pandemic crisis, is assumed to be one of the sectors both negatively and positively affected by the pandemic. The transport sector as one of the main economic sectors will need a major restructuring and a cash injection in order to ensure its efficiency, usability, and eco-friendliness, i.e. the transport sector needs to prepare for the humanitarian and environmental crisis, which is expected in the globalized European and global society after the pandemic.

References

- Andersson, P., & Forslund, H. (2018). Developing an indicator framework for measuring sustainable logistics innovation in retail. *Measuring Business Excellence*, 22(1), 1–13. <https://doi.org/10.1108/MBE-04-2017-0017>
- Bentyn, Z. (2019). *Influence of Brexit on UK logistics performance*. Paper presented at the EpSBS, LXXI, 92-100. <https://doi.org/10.15405/epsbs.2019.10.02.9>
- Čámská, D., & Klečka, J. (2020). Cost development in logistics due to industry 4.0. *Logforum*, 16(2), 219–227. <https://doi.org/10.17270/J.LOG.2020.41>
- Cigu, E., Agheorghiesei, D. T., Gavriluță, A. F., & Toader, E. (2018). Transport infrastructure development, public performance and long-run economic growth: A case study for the Eu-28 Countries. *Sustainability*, 11(1). <https://doi.org/10.3390/su11010067>
- Danileviciene, I., & Lace, N. (2017). The features of economic growth in the case of Latvia and Lithuania. *Journal of Open Innovation: Technology, Market, and Complexity*, 3(4). <https://doi.org/10.1186/s40852-017-0071-2>
- Didych, I., Pastukh, O., Pyndus, Y., & Yasniy, O. (2018). Evaluation of structural elements lifetime by neural network. *Acta Metallurgica Slovaca*, 24(1), 82–87. <https://doi.org/10.12776/ams.v24i1.966>
- Dijkstra, L. Poelman, H. Ackermans, L. (2018) Road transport performance in Europe. *Publications Office of the European Union: Luxembourg*, 2018. Retrieved from: https://ec.europa.eu/regional_policy/sources/docgener/work/2019_02_road_transport.pdf

- Eremina, Y., Lace, N., & Bistrova, J. (2019). Digital maturity and corporate performance: The case of the Baltic States. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(3). <https://doi.org/10.3390/joitmc5030054>
- European Commission (2019). Mobility and transport: *Transport in the EU: Current Trends and Issues*. Retrieved October 22, 2020, from <https://ec.europa.eu/transport/sites/transport/files/2019-transport-in-the-eu-current-trends-and-issues.pdf>
- European Statistical Office (Eurostat) (2020). Database. Retrieved October 22, 2020, from: <https://ec.europa.eu/eurostat/data/database>
- European Statistical Office (OECD-Eurostat) (2020) Entrepreneurship indicators programme. Retrieved October 22, 2020, from <https://ec.europa.eu/eurostat/web/structural-businessstatistics/entrepreneurship/indicators>
- Foundation Robert Schuman (2016, 12, January). Transport in Europe: investment, competitiveness and ecological transition. Retrieved October 22, 2020, from <https://www.robert-schuman.eu/en/european-issues/0378-transport-in-europe-investment-competitiveness-and-ecological-transition>
- Gavric, M.; Miloloza H. (2017). *The importance of road transportation for supply chain in the European Union*. Paper presented at the IMR XIII, Opatija, 671-692.
- Gherghina, Ș. C., Onofrei, M., Vintilă, G., & Armeanu, D. Ș. (2018). Empirical evidence from EU-28 countries on resilient transport infrastructure systems and sustainable economic growth. *Sustainability*, 10(8). <https://doi.org/10.3390/su10082900>
- Gong, Y., Chen, L., Jia, F., & Wilding, R. (2019). Logistics innovation in China: The lens of Chinese Daoism. *Sustainability*, 11(2). <https://doi.org/10.3390/su11020545>
- Intrast EU. (2019). Country codes - country of destination, dispatch and origin. Retrieved October 22, 2020, from <https://www.intrastateu.com/kody-statu/>
- Kostiuk, Y., & Korená, K. (2021). Comparison of Value Added within EU in Terms of Corporate Investment in Research and Development. *SHS Web of Conferences*, 90, 01008. <https://doi.org/10.1051/shsconf/20219001008>
- Ledesma, S., Almanza-Ojeda, D. L., Ibarra-Manzano, M. A., Yopez, E. C., Avina-Cervantes, J. G., & Fallavollita, P. (2020). Differential neural networks (DNN). *IEEE Access*, 8, 156530–156538. <https://doi.org/10.1109/ACCESS.2020.3019307>
- Liu, H., Purvis, L., Mason, R., & Wells, P. (2020). Developing logistics value propositions: Drawing Insights from a distributed manufacturing solution. *Industrial Marketing Management*, 89, 517–527. <https://doi.org/10.1016/j.indmarman.2020.03.011>
- Masters, T. (2018). Programming Algorithms. In *Deep Belief Nets in C++ and CUDA C*. (3 ed.). New York: Apress, pp. 28-37. <https://doi.org/10.1007/978-1-4842-3721-2>
- Melecký, L. (2018). The main achievements of the EU structural funds 2007? 2013 in the EU member states: efficiency analysis of transport sector. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 13(2), 285–306. <https://doi.org/10.24136/eq.2018.015>

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DIGITAL TRANSFORMATION OF MSMEs IN INDONESIA DURING THE PANDEMIC*

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Abstract. Digital transformation is a new trend in Industrial Era 4.0, leading to a new business pattern called the digital economy exacerbated by the crisis due to the Covid-19 pandemic. However, Indonesian Micro, Small, and Medium Enterprises (MSMEs) actors face obstacles in carrying out the business transformation process, as 90% of Indonesian MSMEs are still run conventionally. Therefore, the problem regarding resource unreadiness became the background of this research. This research aimed to find out the following aspects of MSME actors: (1) innovation priority during the Covid-19 pandemic, (2) acceptance of e-commerce, (3) levels of technology adoption, (4) difficulty levels in changing and adapting to technology, and (5) digital transformation in developing businesses due to the Covid-19 pandemic. This research employed a descriptive-quantitative approach in which the data were collected by distributing questionnaires to MSME actors in several cities in Indonesia. The results showed that (1) marketing innovation is the priority of MSMEs, (2) the majority of MSME actors are very receptive to the e-commerce, (3) the digital technology of e-commerce is major needed in MSMEs, (4) MSME actors find difficulties and obstacles in adaptation process, and (5) the combination of offline and online marketing methods became MSME actors' choice as a survival strategy during the Covid-19 pandemic.

Keywords: digital transformation management; e-commerce; MSME; pandemic

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JEL Classifications: O3, O32

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1. Introduction

Industrial Era 4.0 brings the trend of digital transformation. The sustainability of a country's economy is required to answer the challenges in the globalization era and the rapid flow of information (Javaria, Masood, & Garcia, 2020). This trend triggers innovation, productivity, efficiency, and community welfare through increased access to information, knowledge, and data (OECD, 2017). The massive turnover of human labor into machines or process automation has become a global megatrend (United Nations, 2017). The phenomenon of a new technology called the internet has become a dominant parameter in this era (Webster, 1995). The internet is a widespread information infrastructure that influences digital transformation most, especially in the sustainability of the digital economy.

The concept of the digital economy is understood and applied in the form of a new business model based on information technology via the internet. The consistency of the digital economy can be reflected in the competition of large industries utilizing information technology. The trade war between major industries in America (Microsoft, Apple, Amazon, Facebook, and such the like) and major industries in Asia (Alibaba, Samsung, Weibo, Grab, and Gojek) is increasingly getting inevitable (UNCTAD, 2019). Competition in technology and information also affects the level of competition in ASEAN, including Indonesia. According to the data, there have been 125,000 new internet users in ASEAN (Mahmood, 2018). As a result, ± 160 million Indonesian people are influenced by the digital transformation trend, 124% of which access via mobile devices (We Are Social, 2020).

Digital transformation is an inseparable part of regional connectivity efforts. The availability of information strongly supports the sustainability of the digital transformation in the economic sector that involves the main business, organizational structure, and management concept of a business entity (Suryani & Pirzada, 2018). In its development, business actors need to integrate coordination, priority, and implementation as a whole (Rados, Simic, & Misevic, 2019). Connectivity plays a role in encouraging the cooperation of various parties in economic growth through the digital economy (UN ESCAP, 2019). Digital connectivity can also improve the quality of human resources with high technological, information, and communication competencies (see Figure 1).

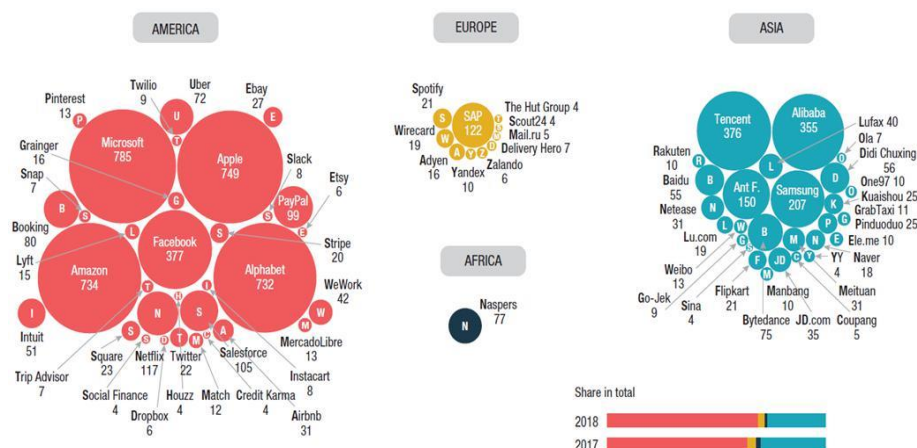


Figure 1. Distribution of Giant Industries in the Information-Based World

Source: (UNCTAD, 2019)

This trend is a stimulant for forming a new business model, better known as the digital economy (Mahmood, 2018). The demand for the digital economy has been stimulated by the Covid-19 pandemic hitting Indonesia since the end of 2019. Covid-19 has affected all sectors of human life, including the economic sector run by Micro, Small, and Medium Enterprises (MSMEs). Therefore, changes in patterns in the economy are required to adapt to this condition to achieve a sustainable economy. In addition, various government policies to suppress the spread of the virus such as social distancing, large-scale social restriction (*Pembatasan Sosial Berskala Besar – PSBB*), work from home (WFH), and others have affected the movement of MSMEs (Hamid, 2020). In all the limited conditions, digital technology is considered to be the best solution in maintaining the economy (Wijoyo & Widiyanti, 2020).

The digital business model provides an opportunity for economic actors to grow well. This digital transformation process brings organizational structural changes to be more integrated through the help of digital technology (Shevyakova et al., 2021). With digital transformation, business entities are expected to adapt to this current condition more quickly and maintain their businesses (Javaria et al., 2020; Rados et al., 2019; Shevyakova et al., 2021).

However, the business structure in Indonesia is different from that in developed countries. About 99.99% of Indonesia's economy is dominated by the MSME sector, not large industries as in developed countries (Saputra & Herlina, 2021). The lower quality human resources, facilities, and infrastructure in Indonesia also hinder economic growth (Kurniawati, Al Siddiq, & Idris, 2020) and (Pirzada, 2016). In the current Industrial Era 4.0, 90% of Indonesia's MSMEs are still run conventionally because MSME actors find the transition from offline to online not easy (Kurniawati & Siddiq, 2020).

In response to this, the Ministry of Cooperatives and SMEs of the Republic of Indonesia has prepared several strategic measures to increase the competitiveness of SMEs and cooperatives for sustainable and independent business and economic growth. In the 2020-2024 Medium-Term National Development Plan (Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024) ("Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024," n.d.), the policies are expected to encourage the use of technology for MSMEs. Moreover, MSMEs are expected to collaborate to innovate to produce products with added values and provide integrated and real-time information (Kementerian Koperasi dan Usaha Kecil dan Menengah Republik Indonesia, 2019).

Based on the above problems, we were interested in and challenged to conduct a study to examine the following aspects of MSME actors during the Covid-19 pandemic: (1) innovation priority during the Covid-19 pandemic, (2) acceptance of e-commerce, (3) levels of technology adoption, (4) difficulty levels in changing and adapting to technology, and (5) digital transformation in developing businesses due to the Covid-19 pandemic.

2. Materials and Methods

The study was quantitative descriptive, and it explained the research findings specifically without correlating one variable with other variables (Neuman, 2013). The data were collected using questionnaires distributed to MSME actors in Indonesia. The objects of this research are MSMEs in Indonesia, including Surabaya, Sidoarjo, Malang, and several other areas. The instruments used in this research were questionnaires and observation guidelines.

Primary data are obtained directly through observations and questionnaires (Sugiyono, 2012). The primary data in this research were related to the digital transformation, digital model development, and creative and innovative measures taken by MSME actors in developing their businesses. After the data collection, the following process was editing, coding, and tabulating the data. Meanwhile, the secondary data of this research were obtained from the Department of Cooperatives and MSMEs and the Medium-Term National Development Plan (Rencana

Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024) (“Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024,” n.d.). The data collected were analyzed using quantitative-descriptive data analysis using the scoring method and presented in tables, graphs, pictures, and descriptions.

3. Results

3.1 MSME Actors’ Innovation Priority in Dealing with the Covid-19 Pandemic

Micro, Small, and Medium Enterprises (MSMEs) are integral parts of economic activities existing in the community. In terms of quality, MSMEs dominates the business sector in Indonesia (99.9%). The world economy is also dominated by MSMEs (up to 90%) (Kurniawati, 2020). Its growth always increases drastically every year (Wahyuni, Irwansyah, & Aprilia, 2019). The small amount of capital needed by MSMEs makes this business sector survive and continue to grow (Kurniawati, Chrissendy, & Saputra, 2019). In 2015, there were 55.2 million MSMEs in Indonesia, and this number continues to grow from year to year (Badan Pusat Statistik Jawa Timur, 2017).

The growth of MSMEs is directly proportional to the increase in MSME contribution to state revenues. For example, in 2016, MSME contributed IDR 7,009,283 billion (59.84% per year) to the GDP of Indonesia, and it increased to IDR 7,704,635.9 billion (60%) in 2017 (Kementerian Koperasi dan Usaha Kecil dan Menengah Republik Indonesia, 2017). It confirms that MSMEs become a business sector contributing the largest to the GDP and are very strategic to be developed (Pirzada et al. 2015).

It reflects that Indonesia has an enormous potential to develop technology-based MSMEs and a creative economy that relies on renewable resources (including ideas, creativity, and innovation from human resources) and is based on the use of science, technology, and cultural heritage. Development is the originality of things which are utilized by end clients which was initially utilized in business area associations (Asmara & Rahayu, 2020). This development is intended to encourage economic growth. In this regard, an innovative approach is needed to create new businesses to develop and deal with the existing challenges and competitions (Jong & Wennekers, 2008). Without innovations, companies will not be able to survive (Baldacchino & Bertram, 2009).

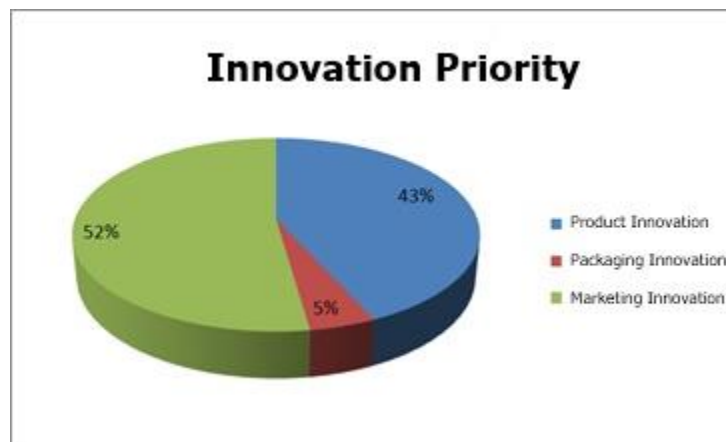


Figure 2. Respondents’ Innovation Priority Levels

Based on Figure 2 above, in terms of innovation priority, 52.3% of the total 44 respondents were included in the marketing category, 43.2% were included in the product marketing category, and the rest 4.5% were included in the packaging category. Most MSMEs prioritize marketing innovation to maintain their business existence and increasing corporate profits. Marketing is a managerial process making individuals or groups achieve what they want and need (Anugrah, 2020).

An effective progress to Industry 4.0 in the coming years will decide the seriousness and future practicality of MSMEs. Innovative freedoms for connecting offices, information and cycles offer the two chances to work on the proficiency of mechanical cycles and productive potential for growing new plans of action. This will reform items and creation, yet in addition mechanical worth creation. It is normal that Industry 4.0 will help both enormous organizations and little and medium-sized ventures (SMEs). Simultaneously, Industry 4.0 is changing the universe of work in a practical manner. Expanding systems administration, adaptability and intricacy of cycles are setting new requests on the abilities of organizations and their workers. Likewise, Industry 4.0 is likewise changing the constructions and types of association inside organizations and the plan of work environments. Nonetheless, advanced change doesn't follow a deterministic example, however, can and ought to be molded. There are a wide range of advancement situations that rely upon the collaboration between innovation, individuals and the association and are controlled by choices at the degree of functional, corporate procedure and work arrangements, as well as the common structure conditions (Shevyakova et al., 2021).

The rapid advancement of technology that is happening today causes perpetrators to businesses must make adjustments quickly, both in terms of terms of strategy and objectives. With new technology, of course, providing great impact on business people. Product approach can be done easily and quickly to consumers. Digital technology is used as a means to market and sell products. Marketing is a managerial and process by which individuals or groups obtain what is wanted and needed by creating, offering, and exchanging products of value to other parties or activities relating to the delivery of products or services from the producer to the with consumers. The goal of this marketing is to attract new customers by promising superior value, setting attractive prices, distribute products or services easily, promote effectively as well as retaining existing customers while still holding on to the principle of customer satisfaction (Saifuddin, 2013). Marketing includes activities related to selling, advertising, promotion, and pricing.

Business actors believe that the use of digital media, especially for trade online, will provide many benefits (Baase, 2008). Client Global Insights (CGI), which is an international business and IT consulting company, illustrates the benefits of digitization in all business lines from raw material management, suppliers, transportation, manufacturing, distribution (CGI, 2017). Digitizing the company with technology integration will optimize the production floor (Prasetyo, 2020). It also changes the way products are produced and marketed (Bédard-Maltais, 2017). Marketing with digital technology costs less than conventional methods (Hood, Brandy, & Dhanasri, 2016). A study shows that digitizing the business lines of small and medium-sized companies can increase efficiency by an average of 3.3% per year (Koch, Kuge, Geissbauer, & Schrauf, 2014). Efficiency is achieved by reducing the company's operating costs (Bédard-Maltais, 2017; CGI, 2017; Hood et al., 2016; Koch et al., 2014).

3.2 MSME Actors' Acceptance of E-Commerce

E-commerce is one of the trends and phenomena developing in the broader community due to technological advancement. This trend brings changes in behavior patterns, both for entrepreneurs and consumers (Kala'lembang, 2020). The immense opportunity and benefit that MSME actors can achieve in applying e-commerce have become pros and cons. It is significant for the E-retailers to keep up with client repurchase goal and support tasks to acquire serious advantage on the lookout. In a web based business world it is significant for the specialist co-op to draw in with clients and give them security from every one of the dangers looked by online

purchasers. (Hong et al., 2010)) and(Cunningham, Gerlach, Harper, & Young, 2005) inspected the effect on the reception of the buy through the Internet also, have illustrated them as: monetary danger, practical, social and actual climate, fusing the fifth measurement of this particular deals framework, the danger of protection.

Today's technological advances, the use of the internet is increasing soar. In particular, the millennials who can't even leaving digital technology every day, whether it's to fulfill daily needs to doing business activities (Pestean, 2021). Right now, you can encounter people doing various businesses on social media. Start from selling equipment, cellphone accessories, to various equipment for beauty. Some people can already take advantage of digital technology to survive with the business. However, not a few people too who do not understand the benefits of digital technology (Anugrah, 2020).

Running a business is certainly not going to be as easy as turning it around hand. Various risks and threats await every day (Husaini, Pirzada, Saiful, 2020). With the development of technology in the digital era, more and more e-commerce emerging in Indonesia. E-commerce is a buying and selling platform that can be accessed by the public using digital technology Of course, this is a threat to MSME businesses in Indonesia. In addition to e-commerce can make buying and selling activities easier, e-commerce also offers various product categories to its customers. This matter make people more interested in shopping through e-commerce instead of having to go around looking for the desired product drains energy even more (Anugrah, 2020).

This demands a change in the perspective of MSME actors towards shifting consumer patterns. Consumers are getting used to make decisions based on digital content and make online purchases of goods (Victor, Fekete Farkas, & Lakner, 2019). This is a challenge but also a promising business opportunity for MSMEs in Indonesia. Based on this, there is a strategy for developing the digitization of MSMEs to support the development of MSMEs and as input for MSME actors (Wijoyo & Widiyanti, 2020).



Figure 3. Respondents' E-Commerce Acceptance Levels

Based on Figure 3 above, 54.5% of the total respondents showed a very high level of e-commerce acceptance, 29.5% had a high level of e-commerce acceptance, and 11.4% had a medium level of e-commerce acceptance. Meanwhile, the rest 4.5% of respondents showed a low level of e-commerce acceptance.

In other words, most MSMEs in Indonesia accepted e-commerce well in developing their businesses. The high e-commerce acceptance level is influenced by the significant impact and benefits of e-commerce on business continuity (Argilés-Bosch, Ravenda, & Garcia-Blandón, 2020). With the idea of digital actual frameworks in

Industry Revolution 4.0, everything is about innovation and it permits the two different ways of correspondences among human and innovation (Teh & Kee, 2019). MSME actors find many conveniences and increase in the competitiveness of their products or services. E-commerce helps MSMEs sell various products and services physically or digitally easily (Lin, Li, Luo, & Benitez, 2020).

Furthermore, in the current industrial era, 90% of Indonesia's MSMEs are still run conventionally. MSME actors find the transition from offline to online uneasy (Kurniawati & Siddiq, 2020). In response to this, the Ministry of Cooperatives and SMEs of the Republic of Indonesia has prepared several strategic measures to increase the competitiveness of SMEs and cooperatives for sustainable and independent business and economic growth. In the 2020-2024 Medium-Term National Development Plan (Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024) ("Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024," n.d.), the policies are expected to encourage the use of technology for MSMEs. Moreover, MSMEs are expected to collaborate to innovate to produce products with added values and provide integrated and real-time information (Kementerian Koperasi dan Usaha Kecil dan Menengah Republik Indonesia, 2019).

The government continues to encourage the use of digital technology to improve productivity and added value of SMEs (Ministry of Communication and Information Technology, 2020). Based on the *Badan Pusat Statistik* (BPS) until 2018 the total MSME units totaling 64.2 million throughout Indonesia. In 2020 Ministry Communication and Informatics (Kominfo) has recorded as many as 9.4 million MSMEs have gone online in marketing their products. That means it's still there around 54.8 million MSMEs who have not been able to take advantage of online media to market their products. The perpetrators As many as 59.2 million MSMEs, 8 percent (3.79 million) have used online platforms in market their products by surfing in cyberspace, this is expected to accelerate transformation of SMEs in Indonesia to digital (Musfiroh, Sabrina, & Wuragil, 2017).

3.3 MSME Actors' Technological Adoption Level in Developing Their Business Due to the Covid-19 Pandemic

Technology has a significant role in the progress of a business entity, including MSMEs. One of the technologies that can help the development of MSMEs is e-commerce. E-commerce was born from technological developments increasingly rushing combined with economic growth (Palinggi & Limbongan, 2020). The adoption of e-commerce highly depends on the decision of MSME owners (Kurniawati & Setiawan, 2019).

The digital economy concept is an economic development that began to be widely recognized in the 21st century and continues to grow along with the rapid transformation of information technology in society (Gaffar, Rahayu, Adi Wibowo, & Tjahjono, 2021). This term is also developing as technology and communication continue to transform rapidly, influencing the efficiency and productivity in every economic activity. One of the advantages of the digital economy is cross-border transactions through digital platforms—the process allows for a global transaction. This transformation begins with an idea, innovative thinking, and technology adoption (Lopez-Gonzalez & Box, 2017). In this concept, the public can access information technology via the internet (G20 - China 2016, 2016).

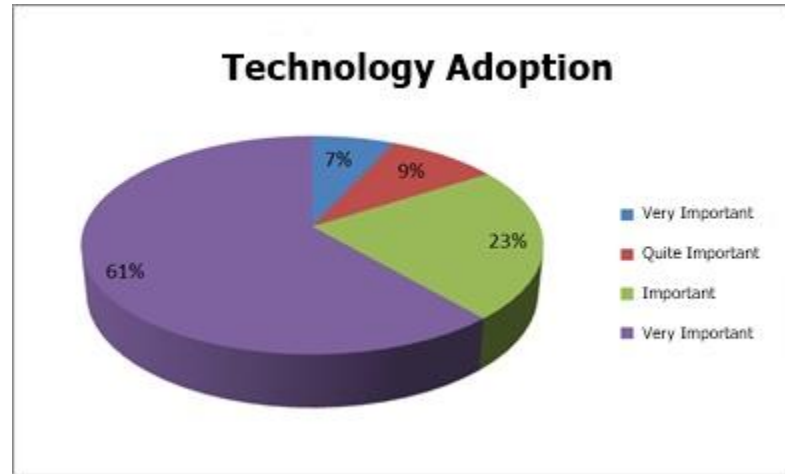


Figure 4. Respondents' Technological Adoption Levels

Figure 4 shows that 61.4% of the total respondents considered technological adoption to be very important, 22.7% considered it important, and 9.1% considered it quite important—meanwhile, the rest, 6.8%, considered technological adoption to be less important.

The majority of MSME actors have realized that technology is a major need in business development. The readiness of MSMEs in adopting e-commerce technology depends on the conditions of the MSME itself, including human resources, finance, and infrastructure. These factors can influence MSME actors to make the right decisions in implementing technology in their organizations (Fardani & Surendro, 2011). On the other hand, the adoption of e-commerce technology is also the impact of the Covid-19 pandemic; this pandemic triggers Indonesia MSMEs to adopt e-commerce technology (Lin et al., 2020). As we know, during the pandemic, the government has issued social restriction rules to reduce the spread of the Covid-19 virus (Hamid, 2020).

Online marketing during the pandemic has had a very positive impact on MSMEs. In addition to developing businesses, MSME actors can also analyze the strategy taken to deal with its competitors. It can even increase sales of the products they sell. Currently, here are many companies that choose online media as their method the marketing. Some of the media that are often used are Facebook, Twitter, Instagram, and others. By using this medium companies will be able to reach their target market. Some features have been provided in the media, ranging from service providers, needs, daily, as well as up-to-date information across the country (Anugrah, 2020).

Adoption of technology such as making Android-Based MSME Product Marketing Applications as a Strategy to Improve the Indonesian Economy. From research results, this concept of E-UMKM is a new breakthrough for marketing products SMEs in penetrating the ASEAN free market. With the existence of E-UMKM is expected to help MSME producers in Indonesia in market their products not only domestically but up to overseas. With the implementation of the rules regarding PSBB, business people MSMEs, of course, also have their own problems to market their products. With the concept of online marketing in the form of applications, the android can make it easier for MSME business people to achieve their target market share. Viewed from the side consumers, the concept of E-MSMEs also makes it easier for consumers to find the product they need, more practical, and of course not requires a lot of energy.

3.4 MSME Actors' Difficulty Level During Technological Changes and Adaptation Due to the Covid-19 Pandemic

The process of adopting and implementing new technologies, such as e-commerce, has its impact. Therefore, the adaptation process is fundamental in determining the level of success. In this transition, MSME actors may find difficulties and obstacles. Figure 4 below shows that 34.1% of the total respondents found the technological changes and adaption complicated and quite complicated. Meanwhile, the other 22.7% found it very difficult, and the rest, 9.1%, encountered no difficulties.

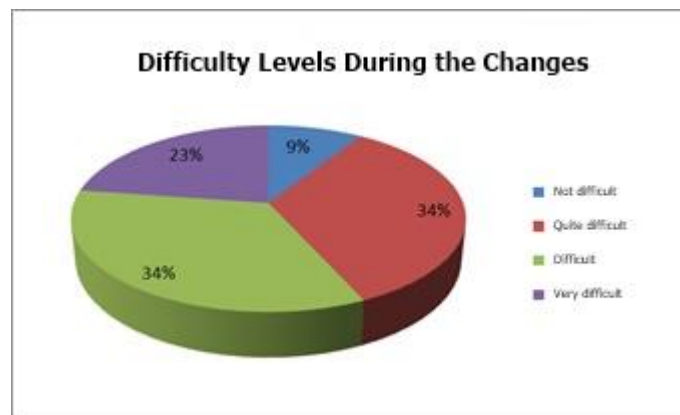


Figure 4. Respondents' Difficulty Levels During Technological Changes and Adaption

The transformation process did not well as expected by MSME actors. There is a polemic between perception and competence towards mastery of technology. The business structure of MSMEs in Indonesia is different from that in developed countries. Problems regarding human resources, facilities, and infrastructure cause this opportunity to be suboptimal in implementation in Indonesia (Kurniawati et al., 2020). The greater part of the world's organizations see Industry 4.0 as a chance. Simultaneously, there are as yet many inquiries concerning its execution. MSME undertakings, specifically, are substantially more wary about the conceivable outcomes of the fourth modern transformation than huge organizations and, contrasted with them, have a more noteworthy need to create - both to carry out Industry 4.0 and to work on the abilities of their representatives (Kwilinski, Vyshnevskyi, & Dzwigol, 2020).

The 4.0 industrial is likewise prompting manageable changes in the realm of work. The new level of adaptability and advanced organizations require creative capability arrangements that are accessible relying upon the circumstance and make the conduct of self-governing digital actual frameworks straightforward to people. Specifically, little is thought at this point about the requirements of MSME endeavors (Shevyakova et al., 2021). What's more, there is an absence of reasonable capability proposition that would plan both experienced workers and novices to the calling explicitly for Industry 4.0. Moreover, Wijoyo & Widiyanti (2020) revealed several obstacles, such as the consumers' lack of knowledge of technology and poor telecommunication infrastructure. Besides, internally, the unreadiness of MSME human resources (employers and workers) in using online methods and the lack of knowledge of online business also hindered the process (Yunus & Wahob, 2021). These require human resource quality improvement and education on the digitalization strategy.

National industry players need to improve a lot, especially in the aspects of implementation and mastery of technology which are the key determinants of company competitiveness (Satya, 2018). The central government through the Indonesian Ministry of Industry has tried to adapt to this change by launching the national agenda

Making Indonesia 4.0 (Dhahir, 2020). Various digital technologies will be developed, such as artificial intelligence (AI), Internet of Things (IoT), wearables, robotics, and 3D printing (Ministry of Industry, Republic of Indonesia 2018). Not only the central government, but local governments also need to think about creating activities that can accelerate digital transformation, especially for Small and Medium Industry business actors. Local government activities in the context of digitalization should be directed to eliminate obstacles that arise in the implementation phase.

Moreover, governments play a role in accelerating the digital transformation of Small and Medium Industries by creating activities aimed at eliminating obstacles that arise in the implementation of digitalization. The alternative activities that can be carried out by the Government are digital literacy education for MSMEs, training and education e-commerce assistance for MSMEs, optimizing the role of UPL-UMKM, expanding the internet network. These activities are carried out by the Department of Industry and Trade and the Office of Communication and Information Technology in accordance with their main duties and functions (Prasetyo, 2020).

In response to this, the Ministry of Cooperatives and SMEs of the Republic of Indonesia has prepared several strategic measures to increase the competitiveness of SMEs and cooperatives for sustainable and independent business and economic growth. In the 2020-2024 Medium-Term National Development Plan (*Rencana Pembangunan Jangka Menengah – RJPM*), the policies are expected to encourage the use of technology for MSMEs. Furthermore, MSMEs are expected to collaborate to innovate to produce products with added values and provide integrated and real-time information (Kementerian Koperasi dan Usaha Kecil dan Menengah Republik Indonesia, 2019).

In addition, during the implementation of the PSBB, the Minister of Cooperatives and SMEs prepared 8 special programs for reduce the impact of covid-19 for the cooperative sector and MSMEs. Among others:

1. Proposing a stimulus for the purchasing power of MSME and cooperative products.
2. Support and make social distancing effective but in time. At the same time, the shops can run their business well.
3. Restructuring program and interest rate subsidy for micro business loans.
4. Special credit restructuring for cooperatives through LPDB KUMKM.
5. Encouraging the provision of masks for medical personnel and the general public.
6. Include micro sectors in the pre-employment card recipient cluster for day worker.
7. Direct cash assistance.
8. Propose Pph 21, import income tax, Pph 25, restitution value added can be relaxed for KUMKM.

With a special program from the Minister of Cooperatives and SMEs, it is hoped that KUMKM actors can bring a positive economic impact. Business actors can take advantage of the program and minimize the impact of PSBB (*Pembatasan Sosial Berskala Besar*) (Kementerian Koperasi dan Usaha Kecil dan Menengah Republik Indonesia, 2019)

3.5 Digital Transformation Carried Out by MSME Actors in Developing Their Business due to the Covid-19 Pandemic

Technological advances require business actors to make adjustments quickly and precisely. To achieve this goal, business actors need several approaches, one of which is the product approach. Digital technology can market and sell products to make the process run efficiently and quickly (Anugrah, 2020). Digital transformation implicates stages in technology adoption. One of the digital transformations conducted by MSMEs is reflected in the changes in marketing patterns. Most MSMEs choose to make changes in marketing as a strategy to survive in business competition (Slamet et al., 2016).

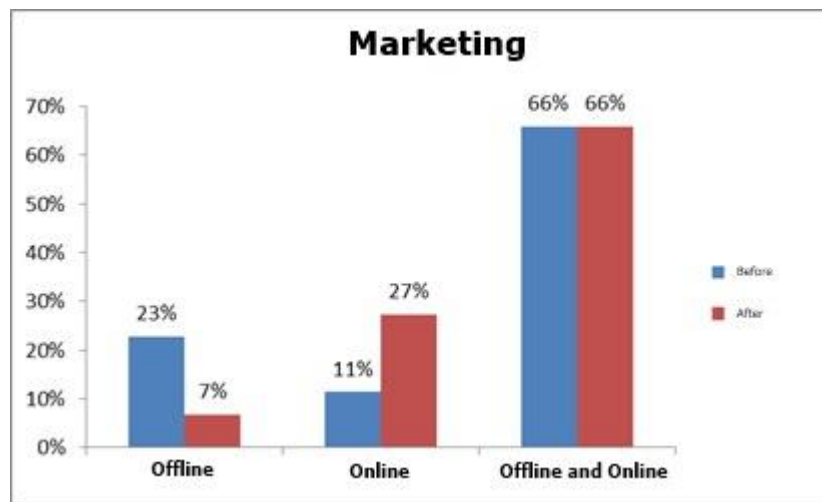


Figure 5. Respondents' Marketing Methods

Figure 5 shows that 66% of respondents carried out the offline and online marketing method before and after the Covid-19 pandemic of the total 44 respondents. Meanwhile, those who carried out the offline marketing method reached 23% before the Covid-19 pandemic and 7% after the Covid-19 pandemic. 11% of the respondents applied online marketing before the Covid-19 pandemic and 27% after the Covid-19 pandemic.

The combination of offline and online marketing methods remains the choice of Indonesia MSME actors as a survival strategy during the Covid-19 pandemic. The large-scale social restriction in various areas during the pandemic has forced MSME actors to change their marketing patterns to run online. Online marketing strategies affect the increase in MSME profits. Findings showed that the Covid-19 pandemic situation provided challenges and opportunities for MSME actors in Indonesia. Online marketing strategies applied by MSME actors during the large-scale social restriction period due to the Covid-19 pandemic are considered highly effective (Anugrah, 2020).

Digital transformation is an absolute movement for MSMEs to survive during the Covid-19 pandemic following changes in consumer patterns that were increasingly accustomed to using online media as a means of making decisions and purchasing goods. Thus, this momentum creates opportunities for MSME actors to carry out transformation (Wijoyo & Widiyanti, 2020). This is in line with research conducted by (Saputra & Herlina, 2021) that stated the outcome clarified that business strength is impacted emphatically, straightforwardly, and fundamentally by business adaptability and work environment otherworldliness. Business adaptability is affected by working environment otherworldliness, favorable to social administration, furthermore, collusion ability. Supportive of social authority of proprietors as well as directors impacts execution of wellbeing convention furthermore, collusion ability.

The application of the digital economy is required to accelerate economic development. Connectivity plays an essential role in maintaining the alignment of levels of economic development with its three domains: physical development, information, and financial flows (CIGA, 2018). Connectivity can increase the effectiveness of a network facilitating the exchange of goods, services, community mobility, and knowledge (Vineles, 2017). Also, connectivity can develop network collectivity that eventually increases and accelerates economic growth. MSME connectivity can be a major instrument in developing individuals, groups, the private sector, and the public sector.

Moreover, online marketing as the application of digital economy is any activity that concerning the marketing activities of a product or service by using or through online media. Online marketing can make it easier for business people to increase profits, but marketing cannot avoid the three components that always accompany, namely competitors, consumers and companies (Saifuddin, 2020). Business people who understand benefits of online marketing will use it to communicate, find customers, and sell their products.

Conclusions

This research concludes that marketing innovation is the priority used by MSME actors as a strategy to survive during the Covid-19 pandemic. The majority of Indonesia MSMEs are very receptive to the application of e-commerce in developing their businesses. MSME actors have realized that technology is a major need in business development in the current digital era. However, most MSME actors find this technological transformation difficult. MSME actors combine online and offline marketing methods to survive during the Covid-19 pandemic to achieve the effectiveness of the transformation process.

References

- Anugrah, R. J. (2020). The effectiveness of the Implementation of the Strategy of Online Marketing by SMES In the Social Restrictions of Large-Scale (PSBB) Corona Viruses Disease 2019 (Covid-19). *Jurnal Manajemen Dan Inovasi (MANOVA)*, 3(2), 55–65. <https://doi.org/10.15642/manova.v3i2.302>
- Argilés-Bosch, J. M., Ravenda, D., & Garcia-Blandón, J. (2020). E-commerce and labour tax avoidance. *Critical Perspectives on Accounting*, 102202. <https://doi.org/10.1016/j.cpa.2020.102202>
- Asmara, A. Y., & Rahayu, A. Y. S. (2020). Innovation in Delivering Public Health Service: Practice in Banyuwangi Regency – Indonesia (SSRN Scholarly Paper No. ID 3551065). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: <https://papers.ssrn.com/abstract=3551065>
- Baase, S. (2008). *A gift of fire: Social, legal, and ethical issues for computing and the Internet*. Upper Saddle River, NJ: Pearson Prentice Hall.
- East Java statistical center. (2017). The Analysis of The Economic Census 2016 Results Listings of The Economic Potential Of East Java. Retrieved from <https://jatim.bps.go.id/>
- Baldacchino, G., & Bertram, G. (2009). The Beak of the Finch: Insights into the Economic Development of Small Economies. *The Round Table*, 98(401), 141–160. <https://doi.org/10.1080/00358530902757867>
- Bédard-Maltais, P.-O. (2017). Industry 4.0: The New Industrial Revolution: Are Canadian Manufacturers Ready? Business Development Bank of Canada.
- CGI. (2017). *CGI Voice of Our Clients*. Retrieved August 23, 2021, from <https://www.cgi.com/en/voice-of-our-clients>
- CIGA. (2018).
- Cunningham, L. F., Gerlach, J. H., Harper, M. D., & Young, C. E. (2005). Perceived risk and the consumer buying process: Internet airline reservations. *International Journal of Service Industry Management*, 16(4), 357–372. <https://doi.org/10.1108/09564230510614004>
- Dhahir, D. F. (2020). The draft strategy of communications in an effort to reduce the digital divide. *Jurnal Pikom (Penelitian Komunikasi dan Pembangunan)*, 20(2), 71–86. <https://doi.org/10.31346/jpikom.v20i2.2235>
- Fardani, A., & Surendro, K. (2011). Strategy The Adoption of Information Technology Based on Cloud Computing. 6.
- G20 - China 2016. (2016). *G20 Digital Economy Development and Cooperation Initiative*. Retrieved from <http://www.g20chn.org/English/Documents/Current/index.html>

- Gaffar, V., Rahayu, A., Adi Wibowo, L., & Tjahjono, B. (2021). The Adoption of Circular Economy Principles in the Hotel Industry (SSRN Scholarly Paper No. ID 3874443). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: <https://papers.ssrn.com/abstract=3874443>
- Husaini, Pirzada, K., Saiful, (2020). Risk Management, Sustainable Governance Impact on Corporate Performance. *Journal of Security and Sustainability Issues*, 9(3), 993-1004. [https://doi.org/10.9770/jssi.2020.9.3\(23\)](https://doi.org/10.9770/jssi.2020.9.3(23))
- Hamid, A. R. A. H. (2020). Social responsibility of medical journal: A concern for COVID-19 pandemic. *Medical Journal of Indonesia*, 29(1), 1–3.
- Hong, S., Kim, D., Ha, M., Bae, S., Park, S. J., Jung, W., & Kim, J. (2010). SNAIL: An IP-based wireless sensor network approach to the internet of things. *IEEE Wireless Communications*, 17(6), 34–42. <https://doi.org/10.1109/MWC.2010.5675776>
- Hood, J., Brandy, A., & Dhanasri, R. (2016). Industry 4.0 engages customers: The digital manufacturing enterprise powers the customer life cycle. *Deloitte Insights*.
- Javaria, K., Masood, O., & Garcia, F. (2020). Strategies to manage the risks faced by consumers in developing e-commerce. *Insights into Regional Development*, 2(4), 774–783. [https://doi.org/10.9770/IRD.2020.2.4\(4\)](https://doi.org/10.9770/IRD.2020.2.4(4))
- Jong, J. D., & Wennekers, S. (2008). *Conceptualizing entrepreneurial employee behaviour*. Zoetermeer: SCALES (SCientific AnaLysis of Entrepreneurship and SMEs),
- Kala'lembang, A. (2020). The adoption of E-Commerce in Supporting the Development of Micro, Small and Medium enterprises (SMES) In the Pandemic Covid-19. *CAPITAL: Jurnal Ekonomi dan Manajemen*, 4(1), 54–65. <https://doi.org/10.25273/capital.v4i1.7358>
- The ministry of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia. (2017). The Development of The Data of Micro, Small, And Medium Enterprises (Smes) And Large Businesses (Ub) Of the Year 2016-2017. Retrieved from <http://www.depkop.go.id>
- The ministry of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia. (2019). Retrieved from <http://www.depkop.go.id>
- Koch, V., Kuge, S., Geissbauer, R., & Schrauf, S. (2014). Industry 4.0: Opportunities and challenges of the industrial internet. *Strategy & PwC*, 5–50.
- Kurniawati, E. (2020). The decision of the Women Owners of SMES in East Java to Adopt E-Commerce. *Jurnal Sosiologi Pendidikan Humanis*, 4(2), 94–102.
- Kurniawati, E., Al Siddiq, I. H., & Idris, I. (2020). E-Commerce Opportunities in the 4.0 Era Innovative Entrepreneurship Management Development. *Polish Journal of Management Studies*, 21(1), 199–210. <https://doi.org/10.17512/pjms.2020.21.1.15>
- Kurniawati, E., Chrissendy, M., & Saputra, D. (2019). Behavioral factor influencing Indonesian micro, small and medium (msme's) owners' decision-making in adopting e-commerce. *Journal of Entrepreneurship, Business and Economics*, 7(1), 92–105.
- Kurniawati, E., & Setiawan, A. (2019, June). *The Role of Indonesian Micro, Small, and Medium Enterprises Owners in Choosing E-Commerce Strategy in the Global Market*. 191–194. Atlantis Press. <https://doi.org/10.2991/icskse-18.2019.37>
- Kurniawati, E., & Siddiq, I. H. A. (2020). Indonesian MSME E-Commerce among the Covid-19 Pandemic. *GATR Global Journal of Business and Social Science Review*, 8(4), 267 – 277.
- Kwilinski, A., Vyshnevskiy, O., & Dzwigol, H. (2020). Digitalization of the EU Economies and People at Risk of Poverty or Social Exclusion. *Journal of Risk and Financial Management*, 13(7), 142. <https://doi.org/10.3390/jrfm13070142>
- Lin, J., Li, L., Luo, X. (Robert), & Benitez, J. (2020). How do agribusinesses thrive through complexity? The pivotal role of e-commerce capability and business agility. *Decision Support Systems*, 135, 113342. <https://doi.org/10.1016/j.dss.2020.113342>

Lopez-Gonzalez, J., & Box, S. (2017). The Future of Technology: Opportunities for ASEAN in the Digital Economy. Global Megatrends: Implications for the ASEAN Economic Community, edited by S. Tay and J. Tijaja. Jakarta: ASEAN Secretariat and Singapore Institute of International Affairs.

Mahmood, I. P. (2018). 7 key challenges for the future of ASEAN. Retrieved from World Economic Forum website: <https://www.weforum.org/agenda/2018/08/7-challenges-to-business-in-the-asean-region-and-how-to-solve-them/>

Musfiroh, M. F. S., Sabrina, L., & Wuragil, S. (2017). Kontribusi Perbankan Syariah Terhadap Perkembangan Umkm Di Kecamatan Banjarnegara. *Manarul Qur'an: Jurnal Ilmiah Studi Islam*, 17(1), 136–158. <https://doi.org/10.32699/mq.v17i1.928>

Neuman, W. L. (2013). *Social Research Methods: Qualitative and Quantitative Approaches*. Boston: Pearson.

OECD. (2017). Going Digital: Making the Transformation Work for Growth and Well-Being. *OECD Publishing*. (Paris). Retrieved from <https://www.oecd.org/mcm/documents/C-MIN-2017-4%20EN.pdf>

Palinggi, S., & Limbongan, E. C. (2020). Pengaruh Internet Terhadap Industri Ecommerce Dan Regulasi Perlindungan Data Pribadi Pelanggan Di Indonesia. *Semnas Ristek (Seminar Nasional Riset Dan Inovasi Teknologi)*, 4(1). Retrieved from <http://www.proceeding.unindra.ac.id/index.php/semnasristek/article/view/2543>

Prasetyo, R. (2020). Local Government Role in the Digital Transformation Acceleration of Small and Medium Industry. *Jurnal Iptekkom (Jurnal Ilmu Pengetahuan & Teknologi Informasi)*, 22(1), 59–75. <https://doi.org/10.33164/iptekkom.22.1.2020.59-75>

Pirzada, K. (2016). Providers and users' perception of voluntary need of human resource disclosure: A content analysis. *Polish Journal of Management Studies*, 14(2) 232-242. <http://doi.org/10.17512/pjms.2016.14.2.22>

Pirzada, K., Mustapha, M. Z. B., & Wickramasinghe, D. (2015). Firm Performance, Institutional Ownership and Capital Structure: A Case of Malaysia. *Procedia-Social and Behavioral Sciences*, 211, 170-176. doi: 10.1016/j.sbspro.2015.11.025

Pestean, V. (2021). Didactic Approaches for a Quality Digital Learning. *GATR Global J. Bus. Soc. Sci. Review*, 9(3), 233 – 241. [https://doi.org/10.35609/gjbssr.2021.9.3\(5\)](https://doi.org/10.35609/gjbssr.2021.9.3(5))

Rados, T., Simic, S., & Misevic, P. (2019). Digital Transformation - The Implementation Process in The Case of The Croatian Chamber of Economy (Cce). *Economic and Social Development 46th International Scientific Conference on Economic and Social Development – “Sustainable Tourist Destinations.”*

National Medium Term Development Plan (RPJMN) 2020-2024. (n.d.). Retrieved from <https://www.bappenas.go.id/id/berita-dan-siaran-pers/rencana-pembangunan-jangka-menengah-nasional-rpjmn-2020-2024/>

Saputra, N; Herlina, M.G. (2021). Double-sided perspective of business resilience: leading SME rationally and irrationally during COVID-19, *J. Mgt. Mkt. Review*, 6(2) 125 – 136. [https://doi.org/10.35609/jmmr.2021.6.2\(4\)](https://doi.org/10.35609/jmmr.2021.6.2(4))

Saifuddin, M. (2013). Influence of the type of endorser and brand name on the attitude of the top of the ad, attitude of top-brand, and purchase intentions on the product high and low involvement. *Jurnal Ekonomi dan Bisnis*, (3), 15.

Saifuddin, M. (2020). A Strategy to increase economic social institutions by utilizing the marketing application based on Android (Case study on business unit Kidpreneur in the foundation of Al Madina Surabaya). *JBT (JURNAL BISNIS dan TEKNOLOGI)*, 7(1), 16–20.

Saputra, N., & Herlina, M. G. (2021). Double-sided perspective of business resilience: leading SME rationally and irrationally during Covid-19 (SSRN Scholarly Paper No. ID 3873947). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: <https://papers.ssrn.com/abstract=3873947>

Satya, V. E. (2018). Strategi Indonesia Menghadapi Industri 4.0. *Info Singkat*, 10(9), 6.

Shevyakova, A., Munsh, E., Arystan, M., & Petrenko, Y. (2021). Competence development for Industry 4.0: Qualification requirements and solutions. *Insights into Regional Development*, 3(1), 124–135. [https://doi.org/10.9770/IRD.2021.3.1\(7\)](https://doi.org/10.9770/IRD.2021.3.1(7))

Slamet, R., Nainggolan, B., Roessobiyatno, R., Ramdani, H., Hendriyanto, A., & Ilma, L. (2016). Development strategy of SMEs in the digital era of the free market. *Jurnal Manajemen Indonesia*, 16(2), 136–147. <https://doi.org/10.25124/jmi.v16i2.319>

Suryani, A., & Pirzada, K. (2018). Analysis of opportunistic behavior of management to company performance. *Polish Journal of Management Studies*, 18(1) 379-388. <http://doi.org/10.17512/pjms.2018.18.1.28>

Sugiyono. (2012). *Research Method Combination (Mixed Methods)*. Bandung: Alfabeta.

Teh, S. S., & Kee, D. M. H. (2019). The Readiness of Small and Medium Enterprises for the Industrial Revolution 4.0 (SSRN Scholarly Paper No. ID 3528271). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: <https://papers.ssrn.com/abstract=3528271>

UN ESCAP. (2019). Retrieved from <https://www.unescap.org>

UNCTAD. (2019). Digital Economy Report 2019: Value creation and capture—implications for developing countries. *Geneva*.

United Nations. (2017). Retrieved from <https://www.un.org>

Victor, V., Fekete Farkas, M., & Lakner, Z. (2019). Consumer attitude and reaction towards personalised pricing in the e-commerce sector (SSRN Scholarly Paper No. ID 3420888). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: <https://papers.ssrn.com/abstract=3420888>

Vineles, P. (2017). ASEAN Connectivity: Challenge for an Integrated ASEAN Community. *RSIS Commentary: S. Rajaratnam School of International Studies, NTU*.

Wahyuni, F., Irwansyah, & Aprilia, M. P. (2019). The process of innovation adoption by the use of e-commerce marketing application. *IEEE 4th International Conference on Computer and Communication Systems*.

We Are Social. (2020, January 30). Digital 2020: 3.8 billion people use social media. Retrieved from <https://wearesocial.com/blog/2020/01/digital-2020-3-8-billion-people-use-social-media>

Webster, C. (1995). Marketing culture and marketing effectiveness in service firms. *Journal of Services Marketing*, 9(2), 6–21. <https://doi.org/10.1108/08876049510085973>

Wijoyo, H., & Widiyanti, W. (2020). The Digitization of Micro, Small and Medium Enterprises (Smes) In the Era of Pandemic Covid-19. *Seminar Nasional Kahuripan*, 10–13.

Yunus, N.M; Wahob, N.A. (2021). The technology and knowledge spillover Effects of FDI on labour productivity. *J. Bus. Econ. Review*, 5(4) 51–58. [https://doi.org/10.35609/jber.2021.5.4\(5\)](https://doi.org/10.35609/jber.2021.5.4(5))

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ANALYSIS OF DISPARITIES IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN THE EU COUNTRIES*

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Abstract. In general, the digital economy plays an important role in the achievement of sustainable economic development, creation of a favourable investment climate, increase in income, and improvement of the welfare of the population. The digital economy is a very broad concept and it refers to the digitalization of the economy as a whole. However, it is based on infrastructure and the intensity of the use of Internet technology. To what extent do the EU countries differ in terms of availability and use of Internet technology? What trends occur in the dynamics of disparities in the level of use of Internet technology in the EU countries? In relation to the abovementioned questions, it is necessary to monitor and analyse the level of use of Internet technology in various EU countries in dynamics. The purpose of the research is to assess the level of use of Internet technology in the EU as a basis of the digital economy, as well as to assess disparities in the use of Internet technology in the EU in the period 2012-2020.

Keywords: EU; Internet use index; disparities; ICT

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1. Introduction

Researchers have increasingly focused on the impact of information and communication technology (ICT) on national economies (Rozite et al., 2019; Al-Busaidi, 2020; Petric et al., 2020; Cheng et al., 2021). ICT has rapidly been integrated not only into people's daily lives, but also into the daily lives of other economic entities – companies (Karczewska, 2020; Steffen, Erdsiek, 2020), organizations (Dmitrieva et al., 2019), and public administration (Goodridge et al., 2019; Krawczyk, 2020). The Digital Single Market Strategy for Europe stated that the Internet and digital technologies are transforming the lives we lead, the way we work as individuals, in business, and in our communities as they become more integrated across all sectors of our economy and society. With the advent of ICT in the economy, digital transformation has become increasingly important, and, as a result, the traditional economy is being transformed. Since the concept of the digital economy is multidimensional and ambiguous, researchers define and measure it from different perspectives (Van Dijk, 2015; Pietrzak & Ziemkiewicz, 2018; Hushtan, & Danylo, 2021). The role of ITC increases during the COVID-19 Pandemic (Arshad, 2020; Petropoulos, 2020; Chamola et al., 2020; Whitelaw et al.; Ye et. al. 2020).

In recent years, many modern authors have been studying problems of the digital economy (Okrepilov et al., 2017; Batyrbekova et al., Van Deursen, et al., 2018; Van Deursen, et al., 2020; Gaziz et al., 2020; Gladkova et al., 2020; Kravchenko, 2020; Hussain, 2021).

The digital economy is rapidly developing in every country around the world. ICT is believed to make an important contribution to national development, so countries support and develop the growth of the digital economy (Graham et al., 2014; Van Deursen, Van Dijk, 2015; Fernández-Portillo, 2020; Perez-Castro, 2021).

It should be noted that the term digital economy has been used relatively recently, since the 1990s, when the first book that mentions and describes the digital economy was published. In his work “The Digital Economy: Promise and Peril in the Age of Networked Intelligence” in 1995, Don Tapscott interpreted and described the concept of the digital economy and how the digital economy will affect the future. It was the first book to mention and describe how the Internet would change the way we do business today (Tapscott, 1996).

In the digital economy, the Internet is the infrastructure for commerce. Therefore, it can be concluded that the Internet is a prerequisite for the existence of the digital economy. Computers will be used not only as an information management tool but also as a means of communication, comparable with modern social networks. The internet makes it possible to build a new economy based on networked human intelligence (Tapscott, 1996).

In the modern era, the problems of uneven development at the country, regional, and global levels are becoming particularly acute. The price of backwardness and costs for those who did not have time to fit into the new system of the world economy, which is being formed under the influence of globalization, is increasing many times in comparison with the past. The information revolution of the late 20th century made time the most important factor of competition. Analysis of the development of countries and regions, as well as factors that positively influence the smoothing of regional disparities, is an area of increased interest for economists dealing with regional policy issues. A new rise in theoretical debates in the field of neoclassical theories took place in the 1990s, which was caused by the study on the problems of convergence conducted by economists R. Barro and X. Sala-i-Martin in 1990. Sigma-convergence is undoubtedly one of the most common assessment methods in the field of measuring regional disparities. Sigma-convergence illustrates how inequalities between countries and regions evolve in relation to a given parameter (for example, GDP per capita, productivity, etc.). Sigma-convergence is defined as a permanent reduction of regional disparities. In other words, this is a convergence of the levels of development of countries and regions according to the parameter under study, and a decrease in interregional inequality. As for the compatibility of the two types of convergence, there is a number of mathematical evidence that sigma-convergence leads to beta-convergence, however, there is no inverse relationship. That is, if there is convergence

according to a certain indicator, beta-convergence analysis will not lead to significant results, and in the absence of convergence, beta-convergence analysis is not indicative. Therefore, the practical analysis of beta-convergence reveals only the presence of certain properties in the behaviour of the indicator under study.

The aim of the research is the assessment of the level of Internet technology use, as well as the assessment of disparities in the level of Internet technology use in the EU countries as the basis for the digital economy.

2. Methodology

It is difficult to compare the states of objects according to several indicators in different periods simultaneously. Even in one area of indicators describing only one characteristic feature, there can sometimes be several dozens of such indicators. For example, to compare different countries according to a given characteristic feature, it is convenient to represent it in scalar form (Lavriņenko, Lavrinoviča, 2013).

The integral indicator is a scalar obtained from a set of estimates of individual analyzed properties of an object. The integral indicator is a well-known integral property of objects which usually reflects many individual, special properties, a tool for analysis. Particular cases may have different characteristics which are evaluated by different indicators. Certain groups of population, regions, etc. can serve as objects (Lavriņenko, Lavrinoviča, 2013).

To construct an integral indicator, it is necessary to perform the following tasks:

- 1) to unify the data;
- 2) to select the most useful primary statistical indicators for diagnostics, i.e. indicators that make up a posteriori lists from a wide set of a priori indicators available in statistical databases;
- 3) to find the weight coefficients for the selected indicators from the a posteriori list;
- 4) to combine the selected a posteriori indicators from the list into one integral indicator (Lavriņenko, Lavrinoviča, 2013).

The digital economy indicators available in the statistical databases were obtained in a standardized way, therefore, the indicators were not standardized. All available indicators of the digital economy used in the research are available in databases as a percentage (%).

In order to create an integral indicator, it is necessary to reduce the statistical data to a single form, so that the range of possible measurement values is from 0 to 100. It was calculated according to the following formula:

- indicators that have a positive impact on the digital economy (stimulants):

$$x'_{ij} = \frac{x_{ij} - x_{\min j}}{x_{\max j} - x_{\min j}} * 100,$$

- indicators that have a negative impact on the digital economy (destimulants):

$$x'_{ij} = \frac{x_{\max j} - x_{ij}}{x_{\max j} - x_{\min j}} * 100,$$

where x'_{ij} — unified indicator's "j" value in the EU country "i", x_{\min} and x_{\max} — lowest (worst) and largest (best) values of the output indicator in the period under study.

The digital economy indicators were divided into stimulants and destimulants (see Table 1).

Table1. Stimulants and destimulants of the Internet technology use indicator in the EU countries.

No	Digital economy indicator	Unit	Stimulant/ destimulant
1.	Proportion of companies that use Customer Relation Management software to analyze customer information for marketing purposes.	Percentage of enterprises out of all enterprises, excluding the financial sector (10 and more people employed)	Stimulant
2.	Companies that receive orders online (at least 1%) and make e-commerce sales at least 1% of their turnover.	Percentage of enterprises out of all enterprises, excluding the financial sector (10 and more people employed)	Stimulant
3.	Percentage of households with access to the Internet at home, includes all types of Internet use.	Percentage of households out of all households.	Stimulant
4.	Percentage of households with a broadband Internet connection.	Percentage of households out of all households.	Stimulant
5.	Proportion of individuals who use mobile devices to access the Internet while away from home or work.	Percentage of individuals out of all individuals	Stimulant
6.	Proportion of individuals who have ordered / purchased goods or services via the Internet for private use in the last three months.	Percentage of individuals out of all individuals	Stimulant
7.	Proportion of individuals who use the Internet to order goods or services, last online purchase within 12 months	Percentage of individuals out of all individuals	Stimulant
8.	Proportion of individuals who have used the Internet to communicate with public authorities (in the last 12 months)	Percentage of individuals out of all individuals	Stimulant
9.	Proportion of individuals who have ever used the Internet	Percentage of individuals out of all individuals	Stimulant
10.	Proportion of individuals who regularly use the Internet, frequency of Internet access: once a week (including daily)	Percentage of individuals out of all individuals	Stimulant
11.	Proportion of individuals who use the Internet to participate in social networks (creating a user profile, posting or other contribution on Facebook, Twitter, etc.)	Percentage of individuals out of all individuals	Stimulant
12.	Proportion of individuals who use the Internet to sell goods or services.	Percentage of individuals out of all individuals	Stimulant

Source: developed by the authors based on the Eurostat database

The abovementioned approach is scalar in the sense that it takes into account the (negative or positive) nature of the impact of the primary statistical indicator on the composite integrated indicator of the Internet technology use and the EU countries, and limits the range of values from 0 to 100 for the comparison between the EU countries (Lavriņenko, 2010).

Although the concept and quantitative methods for assessing convergence were originally developed to study the dynamics of economic growth, they were later extended to the study of the coordination of institutions and other indicators. Empirical studies mainly use two concepts of convergence, which are interrelated but cause different effects of economic policy: β -convergence (Barro, Sala-i-Martin, 1992) and σ -convergence (Sala-i-Martin, 1996a; Sala-i-Martin, 1996b).

According to β -convergence, regions with low absolute values of the indicator under study at the initial period of time are characterised by on average a higher growth rate of this indicator during the process of integration. In order to evaluate β -convergence, growth-initial level regressions are used: $y_i = a + \beta \ln(x_{it-T}) + e$, where x_{it-T} – an indicator at the point of time preceding the current point of time t at T periods (as a rule, the initial period of integration), β – a coefficient to be evaluated, y_i – average growth rates in i - region over T periods, calculated as $\ln(y_{it})/\ln(y_{it-T})$, e – a random deviation. The value of the β coefficient is an indicator of convergence. If $\beta < 0$, a high level of the indicator at the initial time period correlate with relatively lower growth rates (Čizo et al., 2018). Unlike β -convergence, σ -convergence presupposes the decrease with time in a standard deviation of the indicator's value which levels the discrepancy between regions. Another indicator that is often used when there is a trend in time series is the relation of a standard deviation to average (variation coefficient). β -convergence (i.e. a quicker growth of indicators in the states with lower values of this indicator at the initial period) does not necessarily lead to the decrease in inequality on the indicator under study, namely to σ -convergence (Barro, Sala-i-Martin, 1991, 1992). It happens when a group of regions with the initially low absolute values of the indicator constantly changes places with the states with the initially higher absolute values of the indicator, although the overall level of gap between these regions is permanent (Sala-i-Martin, 1996a; Sala-i-Martin, 1996b; Barro, Sala-i-Martin, 1991; Barro, Sala-i-Martin, 1995). The authors used the relative indicators of the variation: the

$$K_R = \frac{X_{\max} - X_{\min}}{\bar{x}},$$

coefficient of range and the coefficient of variation. Their calculation is as follows:

$(V_\sigma) = \frac{\sigma}{\bar{x}}$ where σ – a standard deviation, \bar{x} – an average value, X_{\max} and X_{\min} – the largest and smallest value of the characteristic in the selection (Čizo et al., 2018; Smirnov et al., 2019).

3. Research results

According to the methodology described above, a composite indicator of the Internet technology use in the EU countries in 2012 and 2019/2020 was obtained. As Table 2 shows, Denmark is the leader among the EU countries according to the constructed integral digital economy indicator both in 2012 and 2019/2020. It should be noted that the integral indicator of the Danish digital economy increased from 91.65 in 2012 to 91.91 in 2019/2020.

Table 2. Calculated values of the integral indicator of the Internet technology use and their distribution by quintiles in the EU countries in 2012 and 2019/2020

EU country	2012	2012	2019/ 2020	2019/2020
Denmark	5	91.65	5	91.91
Sweden	5	90.21	5	87.41
Netherlands	5	80.45	5	89.03
Finland	5	79.40	5	79.68
United Kingdom	5	78.89	5	84.14
Luxemburg	4	76.69	4	68.08
Belgium	4	62.63	4	72.98
Germany	4	70.04	4	71.18
Ireland	4	61.13	4	71.40
Austria	4	58.14	3	59.64
France	4	62.41	3	56.00
Estonia	3	44.61	4	63.21
Spain	3	41.56	4	62.13
Malta	3	52.23	3	61.20
Czech Republic	3	40.41	3	53.53
Slovakia	3	51.83	2	44.84
Slovenia	3	46.80	3	46.60
Hungary	2	35.00	2	40.46
Croatia	2	32.26	2	35.59
Latvia	2	37.34	2	41.17
Lithuania	2	28.41	2	45.12
Poland	2	30.00	2	39.55
Portugal	2	28.81	1	27.83
Cyprus	1	26.54	3	47.58
Bulgaria	1	10.63	1	9.15
Greece	1	14,77	1	24.24
Italy	1	16.46	1	22.05
Romania	1	5.33	1	22.29

Source: Calculated by the authors according to the values of the integrated digital economy indicator in the SPSS programme

The authors applied a cartographic method for the distribution of the EU countries into quintile groups (see Fig.1 and 2). According to the distribution of quintile groups, it can be seen that in 2012 and 2019/2020 there are TOP 5 EU countries with the highest integral indicator: Denmark (91.65 and 91.91), Sweden (90.21 and 87.41), the Netherlands (80.45 and 89.03), Finland (79.40 and 79.68), and the United Kingdom (78.89 and 84.14). The largest increase in the value of the digital economy integral indicator is observed in Cyprus: the integral indicator increased by 21.04 values between 2012 and 2019. The lowest value of the integral indicator is observed in Romania - 5.33 in 2012 and 22.29 in 2019. However, there is also an increase in the value of the indicator.

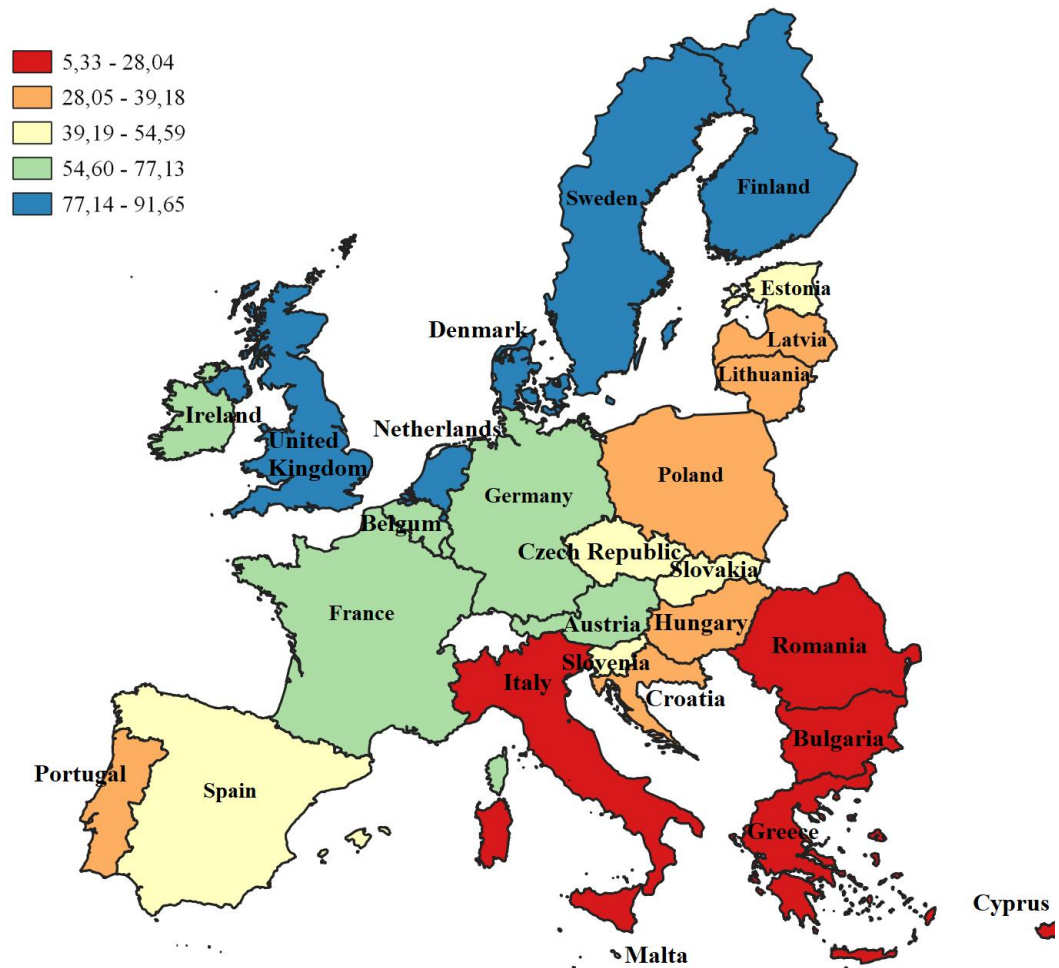


Figure 1. Classification map of the EU countries by values of the integral indicator of the Internet technology use in quintile groups in 2012

Source: Developed by the authors in QGIS 3.18 based on the values of the integral indicator constructed by the authors

According to the values of the integral indicator of the Internet technology use in 2012, quintile group 1 includes Bulgaria, Greece, Italy, Cyprus, and Romania; quintile group 2 includes Bulgaria, Greece, Italy, Cyprus, Romania, Hungary, Croatia, Latvia, Lithuania, Poland, and Portugal; quintile group 3 includes the Czech Republic, Estonia, Spain, Malta, Slovenia, and Slovakia; quintile group 4 includes Belgium, Germany, Ireland, France, Luxembourg, Austria; and quintile group 5 includes Denmark, the Netherlands, Finland, Sweden, and the United Kingdom.

Figure 2. Classification map of the EU countries by values of the integral indicator of the Internet technology use in quintile groups in 2019/2020

Source: Developed by the authors in QGIS 3.18 based on the values of the integral indicator constructed by the authors

In 2019/2020, quintile group 1 includes Bulgaria, Greece, Portugal, Italy, and Romania. Quintile group 2 includes Hungary, Poland, Croatia, Latvia, Lithuania, and Slovakia. Quintile group 3 includes the Czech Republic, Malta, Austria, Cyprus, Slovenia, and France. Quintile group 4 includes Luxembourg, Germany, Estonia, Ireland, Luxembourg, Austria, Spain, and Belgium, and quintile group 5 includes Denmark, the Netherlands, Sweden, Finland, and the United Kingdom.

Comparing the values of 2012 and 2019/2020, a part of the EU countries decreased or increased their quintile group position, but for some EU countries, the quintile group position did not change. Estonia, Spain, and Cyprus increased their position in the quintile group compared to 2012, while Austria, France, Slovakia, and Portugal decreased it. The position of the quintile groups remained unchanged in Sweden, Denmark, the Netherlands, Great Britain, Finland, Luxembourg, Belgium, Germany, Ireland, Malta, the Czech Republic, Slovenia, Hungary, Croatia, Latvia, Lithuania, and Poland.

According to the abovementioned, values of the indicator of Internet technology use are divided into four problem classes. (see Table 3):

Table 3. Problem matrix

		Position in relation to other regions (by quintile groups)	
		Deteriorating or remained unchanged	Improving
Position of the region in relation to past results (dynamics)	Deteriorating	<i>Problem group 1:</i> Sweden, Luxemburg, France, Slovakia, Slovenia, Portugal, Bulgaria	<i>Problem group 2:</i> -
	Improving	<i>Problem group 3:</i> Denmark, Netherlands, Finland, United Kingdom, Belgium, Germany, Ireland, Malta, Czech Republic, Hungary, Croatia, Latvia, Lithuania, Poland, Greece, Italy, Romania, Austria	<i>Problem group 4:</i> Estonia, Spain, Cyprus

Source: developed by the authors based on Lavrinenko 2010, 2015

According to the problem matrix (see Table 3), problem class 1 includes such EU countries as Sweden, Luxembourg, France, Slovakia, Slovenia, Portugal, and Bulgaria. For countries in problem class 1, the position in relation to other EU countries and the position in terms of past indicators deteriorated. Having analysed indicators of each problem class 1 EU country included in the integral indicator, it can be concluded that in **Sweden**, the indicators deteriorating the integral indicator, i.e. the lowest of the 12 indicators, are the proportion of individuals who have ordered/purchased goods or services via the Internet for private use in the last three months, the proportion of individuals who use the Internet to participate in social networks, the proportion of individuals who use the Internet to sell goods or services, and the proportion of companies that use Customer Relation Management software.

In **Luxembourg**, the indicators that lower the integral indicator are the companies that receive orders online (at least 1%) and make e-commerce sales at least 1% of their turnover, the proportion of companies that use Customer Relation Management software, the proportion of individuals who use the Internet to sell goods or services, and the proportion of individuals who have used the Internet to communicate with public authorities.

In **France**, the indicators that lower the integral indicator of internet technology use are the percentage of households with broadband internet access, the proportion of individuals who use the Internet to participate in social networks, the proportion of companies that use Customer Relation Management software, and the companies that receive orders online (at least 1%) and make e-commerce sales at least 1% of their turnover.

The lowest indicators of the **Slovak** integral indicator that negatively affect the overall integral indicator are the companies that receive orders online (at least 1%) and make e-commerce sales at least 1% of their turnover, the percentage of households with Internet access at home, and the percentage of households with broadband internet access.

In **Slovenia**, the lowest indicators included in the integral indicator are the proportion of individuals who have ordered/purchased goods or services via the Internet for private use in the last three months, the proportion of individuals who use the Internet to participate in social networks, the proportion of companies that use Customer Relation Management software, companies that have received orders online (at least 1%), and the companies that receive orders online (at least 1%) and make e-commerce sales at least 1% of their turnover.

In **Portugal**, the lowest indicators are: the percentage of households with broadband Internet access, the proportion of individuals who have ordered/purchased goods or services via the Internet for private use in the last three months, the proportion of individuals who have ever used the Internet, and the proportion of individuals who use the Internet to sell goods or services.

Bulgaria's lowest indicators are the percentage of households with the access to the Internet at home, the percentage of households with broadband Internet access, the proportion of individuals who have ordered/purchased goods or services via the Internet for private use in the last three months, the proportion of individuals who use the Internet to order goods or services, the last online purchase within 12 months, the percentage of individuals who use the Internet for goods or to order services, the last purchase online, and the companies that receive orders online (at least 1%) and make e-commerce sales at least 1% of their turnover.

It can be concluded that in 5 out of 7 EU countries - Slovenia, Slovakia, Luxembourg, France, and Bulgaria, which belong to problem class 1, the lowest indicator is the share of companies that receive orders online (at least 1%) and whose e-commerce sales comprise at least 1% of their turnover. Similarly, in Sweden, Luxembourg, Slovenia, and France, the proportion of companies using Customer Relation Management software to analyze customer information for marketing purposes is low compared to other 12 indicators.

Analyzing the Barro regression and coefficients of variation and amplitude, β -convergence and σ -convergence are established.

Table 4. Barro regression

	Constant	β	Value
$y = a + \beta x$, where $y = \ln(\text{index2019_2020}/\text{index2012})$, $x = \ln(\text{index2012})$	1,316	-0,307	0,000

Source: the authors' calculations based on the values of the integral indicator in the SPSS programme

Note: "index2019/2020" – values of the integral indicator in 2019/2020,
"index2012" – values of the integral indicator in 2012.

Thus, from the data in the Table 4, we obtain the equation $\ln(\text{index2019_2020} / \text{index2000}) = 1,316 - 0,307 * \ln(\text{index2012})$ and, since $\beta = -0.307 < 0$, countries with an initially low value of the integral indicator increase the value of this indicator much faster than countries with initially higher growth rates of the indicator.

Table 5. Amplitude and variation coefficients of the integral indicator of the Internet technology use

Variation coefficients	2012	2019/2020
Amplitude coefficient, (K_R)	1.78	1.53
Year 2012 = 100%	100%	86%
Variation coefficient, (V_σ)	0.5	0.41
Year 2012 = 100%	100%	82%

Source: the authors' calculations based on the values of the integral indicator in the SPSS programme

Analyzing the dynamics of these coefficients in relation to the key parameters, it is possible to provide a qualitative and quantitative description of the existing disparities in the growth in the values of the integral indicator of Internet technology use in the EU.

From 2012 to 2020, the variation coefficient decreased by 18% and the amplitude coefficient decreased by 14% (Table 5). Therefore, there is a decrease in disparities in the use of Internet technology in the EU countries during the period under study.

Conclusions

The authors of the research propose a methodology for constructing an integral indicator of technology use, as well as review the levels of technology use in the EU countries. Based on the constructed digital indicator and its distribution by quintile groups, the authors conclude that there are disparities in the level of Internet technology use in the EU countries in 2012 and 2020. There is a huge gap in the values of the integral indicator of Internet technology use between Romania with the worst indicator value of 5.33 units and Denmark with the best indicator value of 91.65 units: the indicator values in Romania are 17 times worse than in Denmark. In 2020, the worst indicator value in Bulgaria (9.15 units) is already 10 times lower than in Denmark (91.91 units). Thus, disparities in this indicator decrease during the period under study, as clearly evidenced by the decrease in the coefficients of amplitude and variation (sigma-convergence), as well as the negative beta-coefficient in the Barro regression (beta-convergence). The role of convergence of the innovation and technological structure according to the indicators of infrastructure and the use of Internet technology, which is the result of the interpenetration and combination of various technological innovations, cannot be underestimated. Therefore, a technological paradigm is being formed, in which new technologies and the technical unity of the EU countries based on the digitalization of technological processes and available global communications used, has become a structure-forming resource in the economy. The convergence of technological structure is represented as the merger of individual innovations into a system in which the combination of developing technologies creates new industries. In the context of ongoing digitalization, the driving force is a profound modification of economic relations under the influence of the global spread of convergent innovations, such as the emergence of a network form of investment and production management, the gradual loss of the emission-central role of the state as cryptocurrencies develop and new forms of entrepreneurial self-organization (blockchain) emerge.

References

- Al-Busaidi, K.A. (2020). Fostering the development of Oman's knowledge economy pillars through ICT. *VINE Journal of Information and Knowledge Management Systems*, 50(4), 691-714. <https://doi.org/10.1108/VJKMS-06-2019-0093>
- Aleksejeva L, Ostrovska I., Aleksejevs, M. (2020). *A comprehensive place-based approach for smart growth in cross border territories*. ACM International Conference Proceeding Series DEFIN '20: Proceedings of the III International Scientific and Practical Conference.
- Arshad, M. (2020). The Role of Information and Communication Technology to Combat COVID-19 Pandemic: Emerging Technologies, Recent Developments and Open Challenges. *IJCSNS International Journal of Computer Science and Network Security*, 21(4), 93-102. http://paper.ijcsns.org/07_book/202104/20210414.pdf
- Barro, R.J., Sala-i-Martin, X. (1995). *Economic Growth*. Chicago: The MIT Press.
- Barro, R., Sala-i-Martin, X. (1991). Convergence across states and regions. *Brookings Papers on Economic Activity*, 1, 107-158.
- Barro, R., Sala-i-Martin X. (1992). Convergence. *Journal of Political Economy*, 100(2), 223-251.
- Batyrbekova, M., Petrova, M., Ussova, I. (2020). Compositional modeling of assessment of the impact of digital strategy. *Journal of Security and Sustainability Issues*, 10(2), 413-422. [https://doi.org/10.9770/jssi.2020.10.2\(4\)](https://doi.org/10.9770/jssi.2020.10.2(4))
- Chamola, V., Hassija, V., Gupta, V., & Guizani, M. (2020). A comprehensive review of the COVID-19 pandemic and the role of IoT, drones, AI, blockchain, and 5G in managing its impact. *Ieee access*, 8, 90225-90265.
- Cheng, C., Chien, M., Lee, C. (2021). ICT diffusion, financial development, and economic growth: An international crosscountry analysis. *Economic Modelling*, 94, 662-671. <https://doi.org/10.1016/j.econmod.2020.02.008>
- Čizov, E., Ignatjeva, S., Lavrinenko, O. (2018). Assessment of convergence processes of financial depth indicators in states with different levels of economic development. *Journal of Security and Sustainability Issues*, 7(3), 459-476. [https://doi.org/10.9770/jssi.2018.7.3\(8\)](https://doi.org/10.9770/jssi.2018.7.3(8))
- Dmitrieva, M., Dulepova, V., Kashina, E. (2019). Russian Universities in Digital Economy: Current State and Trends. Ed. Soliman, KS. *Vision 2025: Education Excellence and Management Of Innovations Through Sustainable Economic Competitive Advantage*, 3504-3510. <https://www.webofscience.com/wos/woscc/full-record/WOS:000556337405007>
- European Commission. (2020). A Digital Single Market Strategy for Europe. Retrieved April 18, 2021 from <https://ec.europa.eu/digital-single-market/en>
- Fernández-Portillo, A., Almodóvar-González, M., Hernández-Mogollón, R. (2020). Impact of ICT development on economic growth. A study of OECD European Union countries. *Technology in Society*, 63, 101420. <https://doi.org/10.1016/j.techsoc.2020.101420>
- Goodridge, P., Haskel J., Edquist H. (2019). The economic contribution of the "C" in ICT: Evidence from OECD countries. *Journal of Comparative Economics*, 47(4), 867-880. <https://doi.org/10.1016/j.jce.2019.07.001>
- Gaziz, S., Oteshova, A., Prodanova, N., Savina, N., Bokov, D. O. (2020). Digital economy and its role in the process of economic development. *Journal of Security and Sustainability Issues*, 9(4), 1225-1235. [https://doi.org/10.9770/jssi.2020.9.4\(9\)](https://doi.org/10.9770/jssi.2020.9.4(9))
- Gladkova, A., & Ragnedda, M. (2020). *Exploring digital inequalities in Russia: an interregional comparative analysis*. Online Information Review, 44(4). <https://doi.org/10.1108/OIR-04-2019-012>
- Graham, M., Dutton, W.H. (2014). *Society and the Internet*. How Networks of Information and Communication are Changing Our Lives. Oxford: Oxford University Press.
- Hushtan, T., & Danylo, S. (2021). Typologization of the effects from the introduction and use of information and communication technologies and their characteristics. *Baltic Journal of Economic Studies*, 7(3), 88-96. <https://doi.org/10.30525/2256-0742/2021-7-3-88-96>

Homutinin, A., Šipilova, V., Aleksejeva, L. (2021). Population Forecast with Focus on Emigration: Scenarios for the Case of Peripheral Region European. *Journal of Sustainable Development*, 10(3), 139-156. <https://doi.org/10.14207/ejsd.2021.v10n3p139>

Hussain, Z. (2021). Paradigm of technological convergence and digital transformation: The challenges of CH sectors in the global COVID-19 pandemic and commencing resilience-based structure for the post-COVID-19 era. *Digital Applications in Archaeology and Cultural Heritage*, 21, e00182. <https://doi.org/10.1016/j.daach.2021.e00182>.

Karczewska, A. (2020). New Communication Technologies and Employees' Well-Being in the Management of Polish Largest Companies. Proceedings Paper. Education excellence and innovation management: a 2025 vision to sustain economic development during global challenges, 16168-16178

Kravchenko, N., Kuznetsova, S., Ivanova, A., Shemyakin, A. (2020). Regional Aspects of Digital Economic Development. Eds. Bilgin, MH., Danis, H., Karabulut, G., Gozgor, G. *Eurasian Studies in Business and Economics*, 13(1), 265-277. https://doi.org/10.1007/978-3-030-40375-1_19

Krawczyk, P. (2020). Information and Communication Technologies (ICT) Usage in Public Administration - Example of Poland. Proceedings Paper. Education excellence and innovation management: a 2025 vision to sustain economic development during global challenges. USA, INT Business Information Management ASSOC-IBIMA, 12000-12010

Kuc-Czarnecka, M. (2020). COVID-19 and digital deprivation in Poland. *Oeconomia Copernicana*, 11(3), 415-431. <https://doi.org/10.24136/oc.2020.017>

Lavrinenko O., Lavrinovica I. (2013). Integralo indikatoru konstruesana [Construction of Integral Indicators]. Macibu metodiskais lidzeklis. Daugavpils: Daugavpils Universitates Akademiskais apgads „Saule”. 162 lpp.

Lavrinenko, O. (2010). Centraleiropas un austrumeiropas iedzīvotāju dzīves līmeņa veidošanās atšķirību pētīšana pa reģioniem [Study into Differences in the Living Standards Formation in Central and Eastern Europe's Regions]. Promocijas darbs ekonomikas doktora (Dr.oec) zinātniska grāda iegūšanai. Zinātniskais vadītājs V. Kosiedovskis; Daugavpils Universitāte. Sociālo zinātņu fakultāte. Ekonomikas katedra. Daugavpils: Daugavpils Universitāte, 158 p.

Lavrinenko O.(2015). Living standard of Central and Eastern Europe. GlobeEdit, Germany. 146 p.

Okrepilov, V., V., Ivanova, G., N., Monstskikh, I., V. (2017). Digital economy: problems and prospects. *Economy of the North-West: Problems and Prospects of Development*, 3-4 (56-57), 5-28.

Pietrzak, M. B., & Ziemkiewicz, B. (2018). Digital economy in the old European Union member states. T. Loster & T. Pavelka (Eds.). The 11th international days of statistics and economics. Conference proceedings. September 6-8, 2018. Prague: Libuse Macakova, Melandrium.

Perez-Castro, MA., Mohamed-Maslouhi, M., Montero-Alonso, MA. (2021). The digital divide and its impact on the development of Mediterranean countries. *Technology in Society*, 64, 101452. <https://doi.org/10.1016/j.techsoc.2020.101452>

Petric, M., Garbin Pranicevic, D., Simundic, B. (2020). Impact of ict sector deployment on the economic development of the European Union. Proceedings Paper. FEB Zagreb 11th International Odyssey Conference on Economics and Business. 491-503.

Petropoulos, G. (2020). Artificial intelligence in the fight against COVID-19. Bruegel. Retrieved March 23, 2021 from <https://www.bruegel.org/2020/03/artificial-intelligence-in-the-fight-against-covid-19/>

Rozite, K., Balina, S., Freimane, R. (2019). New challenges of economic and business development incentives for sustainable economic growth. Proceedings Paper. *11th International Scientific Conference on New Challenges of Economic and Business Development - Incentives for Sustainable Economic Growth*, 701-708. <https://www.webofscience.com/wos/woscc/full-record/WOS:000489530100065>

Sala-i-Martin, X. (1996a). Regional cohesion: evidence and theories of regional growth and convergence. *European Economic Review*, 40(6), 1325-1352. [https://doi.org/10.1016/0014-2921\(95\)00029-1](https://doi.org/10.1016/0014-2921(95)00029-1)

Sala-i-Martin, X. (1996b). The classical approach to convergence analysis. *The Economic Journal*, 106(437), 1019-1036.

Smirnov, A., Lavrinenko, O., Ohotina, A., Shmarlouskaya, H., Betlej, A. (2019). Assessment of convergence processes of social-economic security indicators in Latvian municipalities. *Journal of Security and Sustainability Issues*, 9(2), 663-674. [http://doi.org/10.9770/jssi.2019.9.2\(23\)](http://doi.org/10.9770/jssi.2019.9.2(23))

Tapscott, D. (1996). *The digital economy: Promise and peril in the age of networked intelligence*. Vol. 1. New York: McGraw-Hill.

Van Dijk J.A.G.M. (2015). *The deepening Divide: Inequality in the information society*. London, Thousand Oaks, New Delhy: SAGE Publications.

Van Deursen A.J.A.M. and Van Dijk J.A.G.M. (2015). *Towards a multifaceted model of internet access to understand digital divides: An empirical investigation*. *Information Society*, 31(5), 379–391.

Van Deursen A.J.A.M. and Mossberger K. (2018). *Any thing for anyone? A new digital divide in internet-of-things skills*. *Policy and Internet*, 10(2), 122–140.

Viete, S., Erdsiek, D. (2020). Mobile Information Technologies and Firm Performance: The Role of Employee Autonomy. *Information Economics and Policy*, 51, 100863. <https://doi.org/10.1016/j.infoecopol.2020.100863>

Whitelaw, S., Mamas, M. A., Topol, E., & Van Spall, H. G. (2020). Applications of digital technology in COVID-19 pandemic planning and response. *The Lancet Digital Health*, 2(8), e435-e440. [https://doi.org/10.1016/S2589-7500\(20\)30142-4](https://doi.org/10.1016/S2589-7500(20)30142-4)

Ye, Q., Zhou, J., & Wu, H. (2020). Using information technology to manage the COVID-19 pandemic: development of a technical framework based on practical experience in China. *JMIR medical informatics*, 8(6), e19515.

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EVALUATION OF INDUSTRIAL ENTERPRISES' PERFORMANCE BY DIFFERENT GENERATIONS OF EMPLOYEES*

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Abstract. The performance of any industrial enterprise is of considerable importance for its long-term success and sustainable prosperity, but it cannot be considered as a certain and universal dimension. Business performance can be evaluated from different perspectives and with a focus on different aspects of performance. The main aim of the paper is to present the relationships between the perceived sustainable organizational and market performance of industrial enterprises and to compare the differences in the perception of selected performance indicators with respect to different generations of employees in industrial enterprises in Slovakia. To carry out the research, a research questionnaire was distributed to managers, specialists, and employees at administrative positions in industrial enterprises. In total, n = 903 respondents, employees of industrial enterprises operating in Slovakia were involved in the research. For the purposes of the research, two research questions and two research hypotheses were set. The research results proved a significant relationship between the perceived level of development of new products, services, or programs and profitability and also proved a significant relationship between perceived quality of products, services, or programs and profitability. The results of the research can be used to improve the evaluation of the sustainable organizational and market performance of the organizations and to improve human resource management with a focus on the coexistence of various generations of employees.

Keywords: generational groups; industrial enterprise; market performance; organizational performance; sustainability

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1. Introduction and literature review

Strategic orientation of organizational performance is crucial to gain significant benefits in the context of sustainability. Taking advantage of new opportunities for sustainable development can have a positive impact on organizational performance (Ameer and Khan, 2020). As stated in their studies (Bilan et al., 2020; Gavurova, Kocisova, Behun and Tarhanicova, 2018), sustainability can help promote and achieve excellent organizational performance and productivity in markets and environments. Sustainability represents developing an organization in which the right balance is created between economic, social and environmental goals (Lorincová et al., 2019; Székely and Knirsch, 2005; Jurík et al., 2020; Gyurák Babel'ová et al., 2020). In practice, sustainable performance is defined as a combination of its economic, social, and environmental dimensions. Such integration combines different factors from these three dimensions and suggests a synthetic approach to performance and integration of economic, social, and environmental organizational goals (Chardine-Baumann and Botta-Genoulaz, 2014). There are known examples of how to manage sustainability, linking sustainability performance, organizational competitiveness, and economic performance (Schaltegger and Wagner, 2017). Thus, the sustainable performance of a company represents not only ensuring economic growth and the good name of the company but also creating value for all stakeholders in the company while maintaining ethical and environmental rules. Sustainability in areas of the company's operations is an issue that has recently come to the fore (Al-Ali et al, 2020). Organizations can also contribute to building a sustainable society through active innovation of products and services that are not only economically attractive and environmentally green, but also contribute to meeting societal needs (Székely and Knirsch, 2005). Sustainable initiatives also contribute to the sustainable competitiveness of an organization (May and Stahl, 2017). The sustainable competitiveness of an organization is also related to innovation and market performance (Hussain et al., 2020). Product innovation can be a source of improving market performance which is crucial for the sustainable competitive advantage of the organization (Davicik et al., 2017). Organizations are looking for ways to improve performance impacting their competitiveness and doing it sustainably. Sustainable performance means that an organization performs efficiently and effectively when providing quality products and services. Human resources play an irreplaceable role in organizational performance. The research on human resource management and performance claims a significant positive relationship (Shah & Khan, 2019). When evaluating the success of a company, terms such as performance, efficiency, and productivity are most often used, which overlap to a certain extent in their meaning (Veber, 2001). The most commonly used indicator of a company's performance and competitiveness is based on productivity (Falcicola, Jansen and Rollo, 2020). Productivity is considered a degree of transformation (utilization or capitalizing) of resources in the form of useful outputs fulfilling the function of the organization (Veber, 2001). It is argued that productivity is the ability to create something regardless of its market value. Productivity simply assumes that what is produced will also manage market value (Karlöf and Lövingsson, 2006). However, higher productivity does not automatically mean increasing profitability (Huselid, 1995). The linkage between productivity and profitability can be considered in many ways. Profit change can be influenced by productivity change, operating efficiency change, or other effects (Grifell-Tatjé and Lovell, 1999).

Effectiveness in its most general meaning represents the efficiency of the use of resources and facilities in achieving goals (Stacho et al., 2019), and at the same time, it is a term that is understood both as a parameter expressing the ratio of input and output or as a relationship between economic performance and total cost of production (Veber, 2001). Performance is defined by the European Foundation for Quality Management (EFQM) as a measure of the results achieved by individuals, groups, organizations, and processes (EFQM, 2003). At the most general level, performance can be described as the essence of a company's existence. Performance expresses the company's ability to be successful and to further develop into the future (Fibírová and Šoljaková, 2005). The company's performance is the company's ability to achieve the desired effects or outputs, preferably in measurable units (Lesáková, 2004). However, an isolated performance assessment does not make sense. It is always necessary to assess the values in relation to a certain basis (values of the measured indicator in the past, values of the indicator for another company, comparison of actually achieved results with the plan or with the so-called ideal

value of the indicator) (Majdúchová and Rybárová, 2019). When measuring performance, it is therefore very important to set performance measurement criteria as well as reference values or target values. The performance of an enterprise must be understood as a unique phenomenon, which is a summary of the benefits it brings to individual stakeholders. Enterprise performance management is important for an organization as also serves to gain a competitive advantage over its competitors (Rolstadås, 1998). Measuring and managing performance is the only way organizations can check that they are moving in the right direction and achieving their goals in terms of their predetermined goals (Ishaq, Awan and Razaq, 2014). Measuring and monitoring performance is also important for improving it (Browne et al., 1997).

Some authors state that the value of a company is determined by its performance (Neumaierová and Neumaier 2002; Suryani, et al., 2018). The fact that terms such as performance, efficiency, and effectiveness are interrelated or intertwined suggest two dimensions of performance, which are answers to the question of what should be done to move us towards a certain goal. The first of these "do the right things" indicates performance in terms of the choice of action we take. We usually refer to this dimension of performance as effectiveness. The second answer, "do the things right", shows performance in terms of the way we carry out the chosen activity. We usually refer to this dimension as efficiency (Marr, 2006; Wagner, 2009). In this meaning, efficiency and effectiveness are perceived as two dimensions of performance. Effectiveness is related to the utility because whether we are individuals or organizations, we strive for effectiveness in everything we do. By this, we mean that a utility will be created for someone in terms of the work and resources needed to create that utility. And at least we create usefulness for our own person, but through the organization, we usually strive to create benefit for someone else: customers, shareholders, members, or fellow citizens (Karlöf and Lövingsson, 2006). Performance can be examined at two levels, at the level of individuals and at the level of the company as a whole. Further performance analysis and apportionment is carried out in these two dimensions (Tomčíková, 2011). While productivity drivers of an enterprise are multiple and complex (Ballestar et al., 2020). Considering performance, however, we must always know about the performance of what is at stake. Thus, when analysing the performance of the organization, it is possible to focus on different aspects or areas of performance. Thus, the performance of the organization can be perceived from different points of view and measured at different levels. The most modern views on enterprise performance management are based on a very constructive idea that the ambition to interconnect and harmonize individual aspects of performance is the best way to achieve synergies that benefit the organization and all stakeholders around (Wagner, 2009).

The performance of an organization can be evaluated in different ways. It depends on the stakeholder who makes this assessment and each person that is in a certain relationship to the company may perceive its performance differently (Stýblo, 2008; Šulák and Vacík, 2005; Browne et al., 1997). The difference in the perception of the apportionment performance of the organization stems from the different perceptions of the stakeholders involved. The biggest challenge for the management of the organization is to maintain a balance between the expectations of the main stakeholders, which are its owners, customers, and employees. As some authors point out, employees are involved in transforming an organization's inputs into company outputs and creating value for the customer that it is willing to pay for it. Thus, they satisfy the primary interest group, which are the owners of the company (partners, shareholders), which has a clearly articulated interest in the existence and functionality of the company (Janišová and Krivánek, 2013). In addition to process performance, human performance plays a significant role in company performance (Marin-Garcia et al., 2011), whereas the performance of processes and people influence each other (Mlkva, Vaňová and Szabó, 2017; Závadská and Závadský, 2014). Employees are, therefore, on the one hand, a very important interested party, which is one of the main stakeholders in the company's performance, and, on the other hand, they are a significant determinant of the enterprise's performance. However, there is very little or no attention paid to how the company's employees perceive its performance as one of the main interested parties in the company's performance. There is also a lack of attention paid to how employees perceive individual aspects, components, or dimensions of business performance.

Generational changes and friction, which often occur at the dividing line between generations, are not new phenomena. Generational change and related problems have forever been part of human society. In the past, however, this process at the workplace has been limited to interactions between two generations of working age: one older generation leaving the workforce effectively and another younger generation entering it, even if at planned progress over the years (Sayers, 2007). At present, as in several European countries, several generations of employees work in the labour market. These generations are or have been influenced, among other factors, by the period in which they grew up and the various socio-economic influences that shaped their views and attitudes. The oldest generation on the labour market is the generation called Baby Boomers. Members of this generation were born in the years 1946-1960. Members of Baby Boomers are aware of their historical importance (Katz, 2017). They are characterized by the fact that they consider the work itself as a value, they also value financial security (Feeney, 2015) and expect to be rewarded at work for their experience (Gravett and Throckmorton, 2007). Predictions suggest that Baby boomers will be active, innovative, and productive for much longer than the generations before them (Coleman, Hladikova and Savelyeva, 2006). The importance of older people for business and entrepreneurship is increasing (Sudbury-Riley, Kohlbacher and Hofmeister, 2015). The aging of the population represents the deepest demographic change in history. Worldwide, life expectancy has increased by decades over five decades, and the severity of this demographic change is affecting economic growth as well as other areas such as labour markets and employment (UN, 2010). The next generation is called Generation X. Members of this generation were born in 1961-1980. Generation X is considered a loyal generation that has considerable influence and responsibility (Neal and Wellins, 2018). Generation X members do not accept traditional values, such as loyalty and collective duty, based on historical ideologies, but values that are close to the individual person and his or her experience (Češčut, 2010). Generation X is currently the one that supports society (Dancu, 2015). This generation has experienced extraordinary levels of technological changes in many areas (Sullivan, Brown and Bann, 2015). The next, younger generation is Generation Y born in 1981-1995. This generation has many opportunities for skills development and seeks constant feedback (Spiro, 2006). Compared to previous generations, Generation Y values a comfortable life (Murphy, Gibson and Greenwood, 2010). Members of this generation value practicality and approach everything individually, and this attitude is based on feelings and emotions (Oczachowska, 2020). Generation Y differs from previous generations and as such affects the dynamics of the organization in which it operates (Artar, 2019). They are characterized by flexibility greater than the flexibility of their predecessors and are open to change, ready to learn, and unwilling to long-term commitments (Karasek and Hysa, 2020). They are picky about choosing a job (Indriyana and Djastuti, 2019). They have a positive approach to work challenges and, together with a willingness to take responsibility, are closely linked to the need for lasting change and experimentation (Kuchárová-MačKayová and Balažová, 2011). They prefer e-mail communication and communication via social networks (Kutlák, 2019). The last, youngest generation on the labour market is Generation Z, born in 1996-2009. This generation manifests itself as independent, but they are largely influenced by their friends and peers (Goh and Jie, 2019; Kamenidou et al., 2019). They prefer freedom and current consumption (Matraeva et al., 2019). It is appropriate to enable them to be surrounded by a creative environment where they can interact and collaborate (Mosca, Curtis and Savoth, 2019). Representatives of Generation Z have the potential to introduce change and innovation in the business environment, thus improving economic growth and organizational efficiency (El-Gohary and Eid, 2013).

Generation values may vary from generation to generation. These different values of different generational groups can influence or control their consumer behaviour (Kaylene et al., 2010) or work preferences and responses to everyday life situations (Kupperschmidt, 2000). The coexistence and interaction of these generations bring benefits in the sense that members of each generation have certain strengths with regard to their living and working period, which enrich mutual cooperation. However, the interaction of these generations can bring various differences in attitudes or values that may hinder mutual cooperation. Given this possibility, it is important to know the differences in opinion and values of individual generations, which subsequently affect their attitudes and work or general behaviour and actions.

2. Methodology

The next chapter of the presented paper is divided into four subchapters. There are defined the research problem and the aim of the research, the determination of research questions and the research hypothesis definition, a description of the data collection tool together with a description of the data collection, and the last part contains the characteristics of the research sample.

Research problem and research aim

The importance of innovation potential for organizations is emphasized by several works (Topolosky, 2000; Košturiak and Chal', 2008, Rr, 2020). Innovative practices have an impact on productivity (Katz, Kochan and Keefe, 1987). The innovations enable enterprises to perform more efficiently and to improve the productivity of the enterprise (Bruni and Verona, 2009; He, Guaita-Martínez and Botella-Carrubi, 2019).

The membership of the Slovak Republic in the European Union and the entering new organizations at Slovak market together with scientific and technical progress caused a competitive conflict between industrial enterprises (Samáková et al., 2017; Čambál, Cagaňová and Šujanová, 2012); Stachová et al., 2020; Gejdoš and Rentková, 2019; Kohnová, Papula and Salajová, 2019). Global changes, including the migration of the working population within the European Union, affect the results of industrial enterprises (Hysa, 2016; Grenčíková and Španková, 2016; Blahová and Pauliková, 2019). Another important factor influencing the composition of employees in industrial enterprises is the change of the demographic curve in the countries of the European Union (Mayhand, 2020) and thus also in the Slovak Republic (Spišáková et al., 2016). It follows from the above that various factors influence the structure of employees at the labor market in Slovakia in a positive and negative way. The inhomogeneity of the age structure means that industrial enterprises currently employ four generations of employees who are different in their personal, motivational, or value characteristics (Gravett and Throckmorton, 2007; Deal, 2007; McCrindle and Wolfinger, 2011). When formulating the research problem, we focused on how the company's employees, as one of the main interested parties in the performance of an enterprise, perceive the partial components of sustainable organizational and market performance. Previous researches (Dollinger, 1992; Powell, 1992) have shown that the perception of partial components of company performance can be considered a reliable indicator of company performance, as the perception of individual parts of organizational performance by employees reflects actual company performance (Delaney and Huselid, 1996).

The main aim of the research was to examine the perceived sustainable organizational and market performance of industrial enterprises with respect to different generations of employees.

Research questions and research hypotheses

The research problem is defined by determined research questions:

Research Question 1: How are selected indicators of organizational performance perceived by employees of industrial enterprises from different generations in comparison with the competitors for the last 3 years?

Research Question 2: How are selected indicators of market performance perceived by the employees of industrial enterprises from different generations in comparison with the competitors for the last 3 years?

Based on the theoretical basis and determined research questions, the following research hypotheses were defined:

Research Hypothesis 1: There is a statistically significant relationship in the perception of employees in industrial enterprises between the factor "development of new products, services or programs" and the factor "profitability" within the perceived organizational and market performance.

Research Hypothesis 2: There is a statistically significant relationship in the perception of employees in industrial enterprises between the factor "quality of products, services or programs" and the factor of "profitability" within the perceived organizational and market performance.

Data collection and data collection tool

The distribution of the collection tool took place during the months of September 2018 to January 2019. The questionnaire was distributed in person in paper form by physical distribution through several interviewers in industrial enterprises throughout the Slovak Republic. The unlikely quota selection of respondents was carried out by random distribution of the research questionnaire to ensure a normal distribution of all characteristics within the research sample. Participation in the research was voluntary and respondents were informed that collected data will be processed anonymously.

The research questionnaire contained 17 items (questions), which were homogeneously synthesized into logical groups according to the area on which the individual groups of questions focused. The first area contained items focused on the perceived organizational performance, and the second area contained items focused on perceived market performance. The remaining items were focused on socio-demographic characteristics. All homogeneous areas were internally consistent and statistically tested, where the values of the Cronbach alpha coefficient reached the level: 0.85 and 0.82, which is sufficient for research purposes (Cortina, 1993), and therefore we can characterize the used questionnaire as reliable. The group of socio-demographic questions consists of the region of activity of the industrial enterprise, the size of the organization, gender, job position, and age of respondents. The possibilities of answering the questions were dichotomic, free, categorical, or interval. In addition to the primary scientific methods used in the creation of the entire research and the presented article, which include analysis, deduction, comparison, or generalization (Bednáriková, 2013; Ochrana, 2019), qualitative and quantitative methods were used for evaluating the collected data. For quantitative evaluation were used following programs: Microsoft Excel and IBM SPSS 22.0 (Statistical Package for the Social Sciences). For the data evaluation purposes, the authors of the paper used a tabular form together with histograms and pie charts, to clarify the individual results of the research.

Description of the research sample

The research sample consisted of employees from industrial enterprises operating in the Slovak Republic. In order to increase the representativeness of the sample, we decided to include in the research sample employees who work in industrial enterprises of various sizes and are members of all generational groups in the labour market. A total of $n = 903$ respondents (employees of industrial enterprises) were involved in the research. The distribution of respondents by date of birth is shown in absolute numbers in Figure 1.

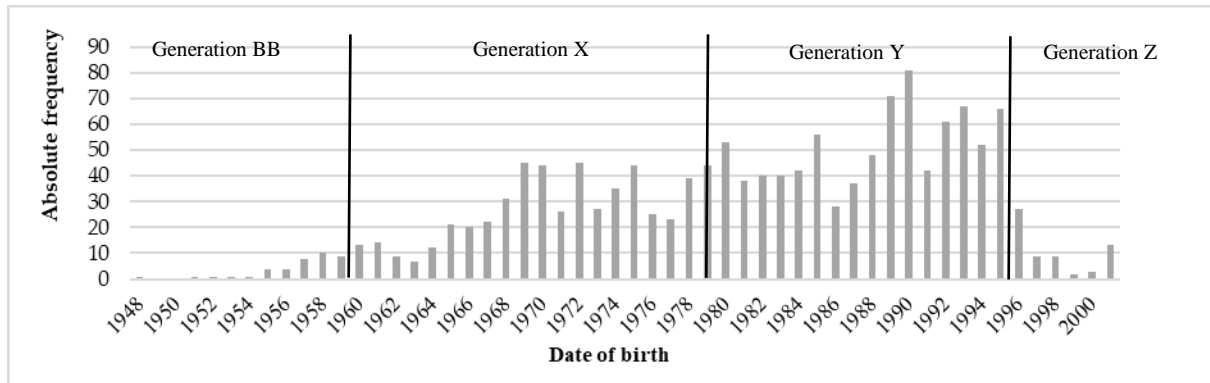


Figure 1. Distribution of respondents by date of birth

Source: own elaboration, 2021

As can be seen in Figure 1, the most numerous groups are respondents born in 1989-1990, the next most numerous groups are respondents born in 1992-1995, both belonging to generation Y. The respondents included in the research were employees of industrial enterprises at administrative positions, specialists, or managers.

The authors divided the respondents (employees of industrial enterprises) into individual generational groups (Baby Boomers born in 1946-1960; Generation X born in 1961-1980; Generation Y born in 1981-1995 and Generation Z born in 1996-2010). The absolute and relative number of respondents included in individual generation groups is shown in Table 1.

Table 1. Distribution of respondents by generational groups

Generations	Generation BB	Generation X	Generation Y	Generation Z	No answer	Total
Absolute frequency	24	348	500	24	7	903
Relative frequency [%]	2.66	38.54	55.37	2.66	0.77	100.00

Source: own elaboration, 2021

Table 1 shows the generational structure of respondents according to the classification of the individual generational group. The data in the table show that respondents belonging to the generation group Y (55.37 %) and X (38.54 %) have the largest representation. The ratio of generational groups participating in research also reflects the current representation of the labour population in the Slovak Republic in recent years. Due to the fact that some respondents did not answer the question concerning the year of birth, but answered the other questions of the questionnaire, they were included in the group without an answer (0,77 %). The following Table 2 shows the distribution of all respondents, participating in the research by job classification.

Table 2. Distribution of respondents by job classification

Job classification	Administrative employees and specialists	Managerial staff	Total
Absolute frequency	631	272	903
Relative frequency [%]	69.88	30.12	100.00

Source: own elaboration, 2021

Table 2 shows that the largest representation among the analysed respondents had administrative employees and specialists (69.88 %). Respondents working at managing positions (team leaders, superiors, managers) had lower representation (30.12 %).

3. Research results

The following subchapter of the presented paper is divided into two parts, which are focused on the evaluation of the determined research questions and the evaluation of the defined research hypothesis.

Research Question 1: How are selected indicators of organizational performance perceived by employees of industrial enterprises from different generations in comparison with the competitors for the last 3 years?

The analysis of the first research question within the organizational performance of the company was focused on two factors, which are quality of products, services, or programs and development of new products, services, or programs. The results for analysed factors can be seen in Table 3 and Table 4, which contain the answers of employees of different generations in absolute and relative terms.

Table 3. Factor: quality of products, services, or programs

Answer / Generation	Generation BB		Generation X		Generation Y		Generation Z		No answer		Total	
	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.
Much worse	4.17	1	2.30	8	1.40	7	0.00	0	14.29	1	1.88	150
Worse	12.50	3	15.52	54	14.40	72	0.00	0	57.14	4	14.73	
Better	75.00	18	65.23	227	65.80	329	83.33	20	0.00	0	65.78	744
Much better	8.33	2	16.09	56	17.20	86	16.67	4	28.57	2	16.61	
No answer	0.00	0	0.86	3	1.20	6	0.00	0	0.00	0	1.00	9
Total	100.00	24	100.00	348	100.00	500	100.00	24	100.00	7	100.00	903

Source: own elaboration, 2021

Table 3 shows that employees generally perceive the organizational performance factor quality of products, services, or programs better and much better (744) and only (150) respondents perceive this factor as much worse and worse compared to their competitors. Partial analysis showed that Generation X rated the factor as much worse and worse (72.82 %). On the contrary, Generation Z rates it (100 %) as much better and better. For Generation Z, there is no indication of a negative evaluation of products, services, or programs quality compared to the competitors. Different perceptions of product quality by different generations of employees may be related to the different duration of their memory trace. Older employees have a longer memory trace and remember that in the past, products were made so that they would not spoil and last as long as possible. Subsequently, the products were manufactured so that they could be easily repaired or disassembled. At present, products are perceived very consumedly, which means that it is common for them to go wrong and have to replace the whole product with a new model. However, such an approach to product quality negatively affects sustainability and sustainable development. Another considered factor of organizational performance was the development of new products, services, or programs, the results for this factor can be seen in Table 4, which is shown below.

Table 4. Factor: development of new products, services, or programs

Answer / Generation	Generation BB		Generation X		Generation Y		Generation Z		No answer		Total	
	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.
Much worse	0.00	0	3.74	13	2.40	12	4.17	1	28.57	2	3.10	235
Worse	29.17	7	21.26	74	23.80	119	20.83	5	28.57	2	22.92	
Better	54.17	13	56.90	198	54.80	274	45.83	11	28.57	2	55.15	651
Much better	16.67	4	17.24	60	17.60	88	29.17	7	14.29	1	17.72	
No answer	0.00	0	0.86	3	1.40	7	0.00	0	0.00	0	1.11	10
Total	100.00	24	100.00	348	100.00	500	100.00	24	100.00	7	100.00	903

Source: own elaboration, 2021

Table 4 shows that respondents, employees of industrial enterprises from different generations, mostly evaluated the development of new products and services as much better and better (658). Compared to the previous factor, however, there are more respondents who rate the development of new products, services, or programs as much worse or worse (235). The partial analysis shows that the Baby Boomers generation evaluates the worst (29.17%) development of new products, services, or programs. The development of new products, services, and programs is evaluated as the best by Generation Z (75%). The importance of the innovation potential of companies is also confirmed by the latest experience with the operation of companies under specific regimes. Based on the analysis carried out by IPA Slovakia, companies affected by restrictions related to the societal threat of the COVID-19 virus can be divided into three groups. For companies that have a decline in orders - especially the automotive industry (Debnár, 2020). Also, according to a press release from Euler Hermes, a world leader in trade receivables insurance and a recognized risk assessment specialist, the automotive industry, together with transport, is the most vulnerable sector of the Covid-19 crisis (Euler, 2020). The second group consists of companies that have neither improved nor deteriorated in terms of the volume of orders and companies that have increased the volume of orders and are "in backlog". These are companies mainly in the food, hygiene, chemical, and pharmaceutical industries (Debnár, 2020). This third group also includes companies that have been able to quickly adapt and adjust their product portfolios to current market needs. From this point of view, the ability to come up with a new product as a factor of market performance is proving to be crucial, especially in whole society crises.

Research Question 2: How are selected indicators of market performance perceived by the employees of industrial enterprises from different generations in comparison with the competitors for the last 3 years?

The analysis of the second research question is focused on two factors of market performance, which are an increase in sales and profitability. The evaluation of considered factors can be seen in Table 5 and Table 6, which contain the responses of employees from different generations in absolute and relative terms.

Table 5. Factor: Increase in sales

Answer / Generation	Generation BB		Generation X		Generation Y		Generation Z		No answer		Total	
	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.
Much worse	0.00	0	2.30	8	1.20	6	0.00	0	0.00	0	1.55	213
Worse	20.83	5	25.29	88	19.80	99	12.50	3	57.14	4	22.04	
Better	62.50	15	54.31	189	58.20	291	58.33	14	28.57	2	56.59	677
Much better	12.50	3	16.67	58	19.40	97	29.17	7	14.29	1	18.38	
No answer	4.17	1	1.44	5	1.40	7	0.00	0	0.00	0	1.44	13
Total	100.00	24	100.00	348	100.00	500	100.00	24	100.00	7	100.00	903

Source: own elaboration, 2021

Table 5 shows that the respondent - employees of industrial enterprises from different generations perceive the factor increase in sales overall much better and better (677), while up to 388 respondents rated the factor as much worse and worse (213), compared to competitors. A partial analysis of the results by generation showed that employees of the Generation X rated the increase in sales much worse and worse (27.59 %). On the other hand, Generation Z evaluates sales growth much better and better (87.5 %). The second analyzed factor was market performance profitability, the result for this factor can be seen in Table 6 below.

Table 6. Factor: Profitability

Answer / Generation	Generation BB		Generation X		Generation Y		Generation Z		No answer		Total	
	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.	Relative fr.	Absolute fr.
Much worse	0.00	0	4.02	14	2.20	11	0.00	0	0.00	0	2.77	229
Worse	25.00	6	22.99	80	22.00	110	16.67	4	57.14	4	22.59	
Better	62.50	15	51.72	180	49.60	248	62.50	15	28.57	2	50.94	660
Much better	8.33	2	20.11	70	24.40	122	20.83	5	14.29	1	22.15	
No answer	4.17	1	1.15	4	1.80	9	0.00	0	0.00	0	1.55	14
Total	100.00	24	100.00	348	100.00	500	100.00	24	100.00	7	100.00	903

Source: own elaboration, 2021

Table 6 contains the results for the analysed market performance factor profitability. Overall, respondents (employees of industrial enterprises) rated profitability as much better and better (660) and the results are almost similar to the previous factor increase in sales. Respondents from Generation X perceive profitability as much worse and worse (27.01 %). Generation Z employees evaluated profitability mostly as much better and better (83.33 %).

The results of the presented research showed that there is a difference in the perception of individual components of organizational and market performance between different generations of employees. While the younger generations evaluate these indicators as better, the oldest generation is more careful in the evaluation and attributes a worse evaluation of the analysed factors.

Research Hypothesis 1: There is a statistically significant relationship in the perception of employees in industrial enterprises between the factor "development of new products, services or programs" and the factor "profitability" within the perceived organizational and market performance.

The result of Pearson's correlation test showed that there is a statistically significant relationship in the perception of employees in industrial enterprises from different generations between the factor new product, service, or program development and the factor of profitability. The mentioned variable correlates at the level of $\text{sig} = 0.05$ with the value of the Pearson correlation coefficient $r = 0.509$. The value of significance reached the required level ($\text{sig} < 0.05$), therefore we do not refute the hypothesis and we can confirm that there is a strong correlation between the tested variables.

Research Hypothesis 2: There is a statistically significant relationship in the perception of employees in industrial enterprises between the factor "quality of products, services or programs" and the factor of "profitability" within the perceived organizational and market performance.

The result of Pearson's correlation test showed that there is a statistically significant relationship in the perception of employees in industrial enterprises from different generations between the factor quality of products, services, or programs and the factor of profitability. The mentioned variable correlates at the level of $\text{sig} = 0.05$ with the value of the Pearson correlation coefficient $r = 0.372$. The value of significance reached the required level ($\text{sig} < 0.05$), therefore we do not refute the above hypothesis and we can confirm that there is a medium correlation between the tested variables.

4. Conclusions

The involvement of stakeholders in the creation of strategies improves the organization's ability to create its own future by re-evaluating the basic assumptions and values on which the organization's strategies are based (Stead & Stead, 2009). At present, various generations of employees meet at the workplace at the same time. These generations differ in their attitudes, values, and views on the performance of the organization. In order for management to use their contribution to creating the future of the organization, it is important to know their views on organizational performance. The research revealed the need to examine the perception and attitudes of employees with respect to various generations. In future research, we would focus on specific areas of sustainable organizational and market performance with an emphasis on sustainability and sustainable competitive advantage creation.

We have not yet experienced the limitations and limits that the current time brings, and the management of industrial enterprises has no experience with them at all. Many areas are not managed centrally, so there is expected proactivity and invention of the management of industrial enterprises (Debnár, 2020). Current time and its limitations bring many challenges that they have to face for a long time. That is why it is important for the management that the organization have the necessary potential in addition to achieving results. Innovation potential, the ability to adapt to market conditions and current requirements and requirements on demands are proving to be key in crises. For this reason, the ability to come up with a new product as a factor in market performance is proving to be crucial, especially in critical social situations. This fact was also proved by the testing defined research hypotheses, where is a statistically significant relationship between perceived profitability (market performance) and the development of new products and services (organizational performance). Based on the perception of employees of industrial enterprises, introducing innovations has a greater impact on consumer behavior and increasing profitability as a factor of market performance than maintaining the quality of products and services provided.

When managing performance, the management of enterprise focuses mainly on rather quantifiable performance indicators: economic, financial indicators, achieved profit, and whether there is labor productivity, which, however, often do not reflect the actual performance of the organization. These indicators reflect previous periods and cannot be used to predict the ability of an enterprise to grow or survive in new or crises. However, from the point of view of objective assessment of the enterprise performance, it is important that the owners or managers of

the enterprise focus not only on financial, often considered as objective indicators of the business success, but also take into account the opinion on performance from the perspective of individual stakeholders. Although the importance of employees in creating value and contributing to business performance is often emphasized, employees are often overlooked as one of the major interested parties that represents one of the main stakeholders in business performance. The employees' perception of enterprise performance is an important indicator that indicates not only the current state or success of the enterprise but in the context of sustainable development has significant predictive importance in terms of using the human potential to ensure sustainable prosperity

References

- Al-Ali, N. M.Y.M., Gorgenyi-Hegyes, E. & Fekete-Farkas, M. (2020). Perceived corporate sustainability practices and performance of small and medium enterprises (SMEs) in Qatar. *Polish Journal of Management Studies*, 22(1), 26-42. <https://doi.org/10.17512/pjms.2020.22.1.02>
- Ameer, F. & Khan, N. R. (2020). Manager's Age, Sustainable Entrepreneurial Orientation and Sustainable Performance: A Conceptual Outlook. *Sustainability*, 12(8), 3196. <https://doi.org/10.3390/su12083196>
- Artar, M. (2019). Generation Y' and Narcissism Conference: ISMC 2019 - 15th International Strategic Management Conference. <https://doi.org/10.15405/epsbs.2019.10.02.24>
- Ballestar, M. T., Díaz-Chao, Á., Sainz, J. & Torrent-Sellens, J. (2020). Knowledge, robots and productivity in SMEs: Explaining the second digital wave. *Journal of Business Research*, 108(1), 119-131. <https://doi.org/10.1016/j.jbusres.2019.11.017>
- Bednáriková, M. (20013). Úvod do metodológie vied (Introduction to the methodology of sciences). Trnava: Filozofická fakulta Trnavskej univerzity v Trnave.
- Bilan, Y., Hafezali I. H., Muhammad H. & Sebastian K. (2020). Sustainability and Economic Performance: Role of Organizational Learning and Innovation. *Inzinerine Ekonomika-Engineering Economics*, 31(1), 93–103. <https://doi.org/10.5755/j01.ee.31.1.24045>
- Blahová, J. & Pauliková, A. (2019). Psychosocial work strain and its influence on decision-making processes. *ICERI 2019 Proceedings 12th International Conference of Education. Research and Innovation*. 3898-3905. <https://doi.org/10.21125/iceri.2019.0986>
- Browne, J., Devlin, J., Rolstadas, A. & Andersen, B. (1997). Performance measurement: The ENAPS approach. *The International Journal of Business Transformation*. Available from internet: https://www.researchgate.net/publication/233862752_Performance_measurement_The_ENAPS_approach
- Bruni, D. S. & Verona, G. (2009). Dynamic marketing capabilities in Science-based firms: An exploratory investigation of the pharmaceutical industry. *British Journal of Management*, 20(1), 101-117. <https://doi.org/10.1111/j.1467-8551.2008.00615.x>
- Čambál, M., Cagánová, D. & Šujanová, J. (2012). The industrial enterprise performance increase through the competency model application. *Proceedings of the 4th European Conferences on Intellectual Capital (ECIC 2012)*, 108–126.
- Češčut, R. (2010). Generation X in Slovenia(n). *Acta Neophilologica*, 43(1-2), 93-105. <https://doi.org/10.4312/an.43.1-2.93-105>
- Chardine-Baumann, E. & Botta-Genoulaz, V. (2014). A framework for sustainable performance assessment of supply chain management practices. *Computers & Industrial Engineering*, 76(2014), 138-147. <https://doi.org/10.1016/j.cie.2014.07.029>
- Coleman, L., Hladikova, M. & Savelyeva, M. (2006). The baby boomer market. *J Target Meas Anal Mark*, 14, 191–209. <https://doi.org/10.1057/palgrave.jt.5740181>
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*, 78(1), 98–104. <https://doi.org/10.1037/0021-9010.78.1.98>
- Dancu, V. S. (2015). Generation X - Romania's fallen generation. Available from internet: https://www.researchgate.net/publication/314351685_Generation_X

Davcik N.S., Sharma P. & Grigoriou N. (2017). Exploring the Role of Brand Equity and R&D as Drivers of Product Innovation and Market Performance. In: Rossi P. (eds) Marketing at the Confluence between Entertainment and Analytics. Developments in Marketing Science: Proceedings of the Academy of Marketing Science. Springer, Cham. Deal, J. J. (2007). Retiring the Generation Gap How Employees Young and Old Can Find Common Ground. San Francisco: Jossey-Bass, Wiley & Sons. https://doi.org/10.1007/978-3-319-47331-4_3

Deal, J. J. (2007). Retiring the Generation Gap How Employees Young and Old Can Find Common Ground. San Francisco: Jossey-Bass, Wiley & Sons.

Debnár, R. (2020). Ste pripravení zvládnuť krízu bez výraznejších následkov? (Are you ready to handle the crisis without significant consequences?) Available from internet: [https://www.ipaslovakia.sk/clanok/ste-pripraveni-zvladnut-krizu-bez-vyraznejsich-nasledkov?utm_source=IPA+Slovakia+web&utm_campaign=65bbbe162c-20200424_koucing&utm_medium=email&utm_term=0_b0cc9f06ca-65bbbe162c-236628413&ct=t\(20200424_koucing\)&mc_cid=65bbbe162c&mc_eid=2d87474d5e](https://www.ipaslovakia.sk/clanok/ste-pripraveni-zvladnut-krizu-bez-vyraznejsich-nasledkov?utm_source=IPA+Slovakia+web&utm_campaign=65bbbe162c-20200424_koucing&utm_medium=email&utm_term=0_b0cc9f06ca-65bbbe162c-236628413&ct=t(20200424_koucing)&mc_cid=65bbbe162c&mc_eid=2d87474d5e)

Delaney, T. J. & Huselid, M. A. (1996). The Impact of Human Resource Practices on Perceptions Organizational Performance. The Academy of Management Journal, 39(4), 949-969. <https://doi.org/10.5465/256718>

Dollinger, M. J., & Golden, P. A. (1992). Interorganizational and collective strategies in small firms: Environmental effects and performance. Journal of Management, 18(4), 695–715. <https://doi.org/10.1177/014920639201800406>

EFQM Excellence Model. (2003). Brussels: EFQM.

El-Gohary, H. & Eid, R. (2013). Leadership teaching impact on tourism students' attitudes and perceptions toward leadership in developing economies: The case of Egypt. Journal of Hospitality & Education, 25(4), 180–192. <https://doi.org/10.1080/10963758.2013.850297>

Euler H. (2020). TLÁČOVÁ SPRÁVA. Kríze Covid-19 neunikne takmer žiadne odvetvie. Ktoré tri odvetvia sú zasiahnuté najviac? (PRESS RELEASE. The Covid-19 crisis will escape almost no industry. Which three sectors are most affected?) Available from internet: www.eulerhermes.sk

Falciola, J., Jansen, M. & Rollo, V. (2020). Defining firm competitiveness: A multidimensional framework. World Development, 129(2020), 104857. <https://doi.org/10.1016/j.worlddev.2019.104857>

Feeney, P. (2015). The Baby Boomer Generation: A Lifetime of Memories. United Kingdom. The History Press.

Fibířová, J. & Šoljaková, L. (2005). Hodnotové nástroje řízení a měření výkonnosti podniku (Value tools for managing and measuring business performance). Praha: ASPI.

Gavurova, B., Kocisova, K., Behun, M. & Tarhanicova, M. (2018). Environmental performance in OECD countries: A non-radial DEA approach. Acta Montanistica Slovaca, 23(2), 206–215.

Gejdoš, P. & Rentková K. (2019). Benefits of process management and their impact on performance improvement in the Slovak business environment. Proceedings of the international conference on Economics, management and technology in enterprises, 78(1), 53-56.

Goh, E. & Jie, F. (2019). To waste or not to waste: Exploring motivational factors of Generation Z hospitality employees towards food wastage in the hospitality industry. International Journal of Hospitality Management, 80(1), 126-135. <https://doi.org/10.1016/j.ijhm.2019.02.005>

Gravett, L., Throckmorton, R. (2007). Bridging the Generation Gap. How to Get Radio Babies, Boomers, Gen Xers, and Gen Yers to Work Together and Achieve More. USA, Franklin Lakes. Career Press.

Grenčířková, A., Španková, J. (2016). Labour Migration Trends in the Slovak Republic. Journal of Scientific Papers ECONOMICS & SOCIOLOGY, 9(2), 158-167. <https://doi.org/10.14254/2071-789X.2016/9-2/11>

Griffell-Tatjé, E. & Lovell, C. (1999). Profits and Productivity. Management Science, 45(9), 1177-1193. Available from internet: <https://www.jstor.org/stable/2634831>

Gyurák Babel'ová, Z., Stareček, A., Koltnerová, K. & Cagaňová, D. (2020). Perceived Organizational Performance in Recruiting and Retaining Employees with Respect to Different Generational Groups of Employees and Sustainable Human Resource Management. Sustainability, 12(2), 574. <https://doi.org/10.3390/su12020574>

- He, Q., Guaita-Martínez, J. M. & Botella-Carrubi, D. (2019). How brand equity affects firm productivity: The role of R&D and human capital. *Economic Research-Ekonomska Istraživanja*, 1-17. <https://doi.org/10.1080/1331677X.2019.1686045>
- Huselid, M. A. (1995). The Impact of Human Resource Management Practices on Turnover, Productivity, and Corporate Financial Performance. *Academy of Management Journal*, 38(3), 635-672.
- Hussain, I., Mu, S., Mohiuddin, M., Danish, R.Q. & Sair, S.A. (2020). Effects of Sustainable Brand Equity and Marketing Innovation on Market Performance in Hospitality Industry: Mediating Effects of Sustainable Competitive Advantage. *Sustainability*, 12(7), 2939. <https://doi.org/10.3390/su12072939>
- Hysa, B. (2016). Zarządzanie różnorodnością pokoleniową (Establishment of generational generations). *Zeszyty. Naukowe Politechniki Śląskiej, seria Organizacji Zarządzanie*, 97(1964), 385–398.
- Indriyana, F. & Djastuti, I. (2019). Work values of generation Y. *Diponegoro International Journal of Business*, 1(1), 40-48. <https://doi.org/10.14710/dijb.1.1.2018.40-48>
- Ishaq B. M., Awan, H.M. & Razaq, Z. (2014). The key performance indicators (KPIs) and their impact on overall organizational performance. *Qual Quant*, 48, 3127–3143. <https://doi.org/10.1007/s11135-013-9945-y>
- Janišová D. & Krivánek M. (2013). *Velká kniha o řízení firmy. Praktické postupy pro úspěšný rozvoj* (A great book on business management. Practical procedures for successful development). Praha: Grada Publishing.
- Jurík, L., Horňáková, N., Šantavá, E., Cagaňová, D. & Sablik, J. (2020). Application of AHP method for project selection in the context of sustainable development. *Wireless Networks*, 1-10. <https://doi.org/10.1007/s11276-020-02322-2>
- Kamenidou, I. C., Mamalis, S. A., Pavlidis, S. & Bara, E. Z. G. (2019). Segmenting the Generation Z Cohort University Students Based on Sustainable Food Consumption Behaviour: A Preliminary Study. *Sustainability*, 11(3), 837. <https://doi.org/10.3390/su11030837>
- Karasek, A. & Hysa, B. (2020). Social media and generation Y, Z - A challenge for employers. *Scientific Papers of Silesian University of Technology – Organization and Management Series*, 144, 227-237. <http://dx.doi.org/10.29119/1641-3466.2020.144.18>
- Karlöf, B. & Lövingsson F. H. (2006). *Management od A do Z. Klíčové pojmy a termíny* (Management from A to Z. Key terms and terms). Brno: Computer Press.
- Katz, H. C., Kochan, T. A. & Keefe, J. H. (1987). Industrial Relations and Productivity in the U.S. Automobile Industry. *Brookings Papers on Economic Activity*, 18(3), 685-728. <http://dx.doi.org/10.2307/2534452>
- Katz, S. (2017). Generation X: A Critical Sociological Perspective. *Journal of the American Society on Aging*, 41(3), 12-19.
- Kaylene, C. W., Robert, A. P., Alfred, R. P. & Edward, H. H. (2010). Multi-Generational Marketing: Descriptions, Characteristics, Lifestyles, and Attitudes. *Journal of Applied Business and Economics*, 11(2), 1-17.
- Kohnová, L., Papula, J. & Salajová, N. (2019). Internal factors supporting business and technological transformation in the context of Industry 4.0. *Business: Theory and Practice*, 20, 137-145. <https://doi.org/10.3846/btp.2019.13>
- Košturiak J. & Chaľ. J. (2008). *Inovace: Vaše konkurenční výhoda!* Brno: Computer Press.
- Kuchárová-MačKayová, V. & Balážová, V. (2011). Characteristics of generation Y and its future occupation - comparison of opinions. *HRM&E*, 5(1), 78-93.
- Kupperschmidt, B. R. (2000). Multigeneration Employees: Strategies for Effective Management. *The Health Care Manager Journal*, (19(1), 65-76.
- Kutlák, J. (2019). Generations Y and Z in the workplace: perception of teamwork. *ACC JOURNAL*, 25(2), 65-77. <https://doi.org/10.15240/tul/004/2019-2-005>
- Lesáková, Ľ. (2004). *Metódy hodnotenia výkonnosti malých a stredných podnikov* (Methods for evaluating the performance of small and medium - sized enterprises). Banská Bystrica: Univerzita Mateja Bela, Ekonomická fakulta.

Lorincová, S., Štarchoň, P., Weberová, D., Hitka, M. & Lipoldová, M. (2019). Employee Motivation as a Tool to Achieve Sustainability of Business Processes. *Sustainability*, 11(13), 3509. <https://doi.org/10.3390/su11133509>

Majdúchová, H. & Rybárová, D. (2019). *Podnikové hospodárstvo pre manažérov* (Business Economy for managers). Bratislava: Wolters Kluwer.

Marin-Garcia, J. A., Miralles, C., Garcia-Sabater, J. P. & Perello-Marin, M. R. (2011). Alternative tools to mass production and human performance indicators in sheltered work centers of Valencian community (Spain). *Journal of Industrial Engineering and Management*, 4(3), 467-480. <http://dx.doi.org/10.3926/jiem.2011.v4n3.p467-480>

Marr, B. (2006). *Strategic Performance Management. Leveraging and measuring your intangible value drivers*. First edition. Oxford: Elsevier.

Matraeva, L., Vasiutina, E., Belyak, A., Solodukha, P., Bondarchuk, N. & Efimova, M. (2019). Economic Model of Generation Z Behavior. *Academic Journal of Interdisciplinary Studies*, 8(3), 123-324. <https://doi.org/10.36941/ajis-2019-0011>

May, G. & Stahl, B. (2017). The significance of organizational change management for sustainable competitiveness in manufacturing: exploring the firm archetypes, *International Journal of Production Research*, 55(15), 4450-4465. <https://doi.org/10.1080/00207543.2016.1261197>

Mayhand, D. (2020). Globalization: Understanding the Impact of Cultural Differences in Global Organizations. *Open Journal of Leadership*, 9(1), 34-52. <https://doi.org/10.4236/ojl.2020.91003>

McCrindle, M. & Wolfinger, E. (2011). *The ABC of XYZ. Understanding the Global Generations*. Sydney: University of New South Wales Press.

Míkva, M., Vaňová, J. & Szabó, P. (2017). Evaluation of employees' performance - identification of problems and proposals for their elimination. *Journal of Interdisciplinary Research*, 7(2), 219-224.

Mosca, J., Curtis, K. P. & Savoth, G. P. (2019). New Approaches to Learning for Generation Z. *Journal of Business Diversity*, 19(3), 66-74. <https://doi.org/10.33423/jbd.v19i3.2214>

Murphy, E. F., Gibson, J. W. & Greenwood, R. A. (2010). Analyzing Generational Values among Managers and Non-Managers for Sustainable Organizational Effectiveness. *SAM Advance Management Journal*, 75(1), 2010, 33-55.

Neal, S. & Wellins, R. (2018). Generation X — not millennials — is changing the nature of work. Available from internet: <https://www.cnbc.com/2018/04/11/generation-x--not-millennials--is-changing-the-nature-of-work.html>

Neumaierová, I. & Neumaier, I. (2019). *Výkonnost a tržní hodnota firmy* (Performance and market value of the company). Praha: Grada.

Ochrana, F. 2019. *Metodologie, metody a metodikavědeckého výzkumu* (Methodology, methods and methods of scientific research). Praha: Nakladatelství Karolinum.

Oczachowska, A. (2020). Purchase Behaviours of Generation Y. *Annales Universitatis Mariae Curie-Skłodowska sectio H Oeconomia*, 54(1), 67-75. <https://doi.org/10.17951/h.2020.54.1.67-75>

Powell, T. C. (1992). Organizational alignment as competitive advantage. *Strategic Management Journal*, 13(2), 119-134. <https://doi.org/10.1002/smj.4250130204>

Rolstadås, A. (1998). Enterprise performance measurement. *International Journal of Operations & Production Management*, 18(9/10), 989-999. <https://doi.org/10.1108/01443579810225577>

Rr, E. (2020). The effects of leadership and employee performance on innovation performance among Indonesian SMES. *Polish Journal of Management Studies*, 21(2), 370-383. <https://doi.org/10.17512/pjms.2020.21.2.26>

Samáková, J., Babčanová, D., Hrablík Chovanová, H., Mesárošová, J. & Šujanová, J. (2017). Using the communication methods, tools and support during management of project communication in industrial manufacturing enterprises. *Vedecké práce MTF STU v Bratislave so sídlom v Trnave. Research papers Faculty of Materials Science and Technology Slovak University of Technology in Trnava*, 25(41), 51-62. <https://doi.org/10.1515/rput-2017-0021>

Sayers, R. (2007). The Right Staff from X to Y. *Library Management*, 28(8/9), 474-487. <https://doi.org/10.1108/01435120710837765>

Schaltegger, S., Wagner, M. (2017). *Managing the Business Case for Sustainability. The Integration of Social, Environmental and Economic Performance*. London: Routledge. Available from internet: <https://www.routledge.com/Managing-the-Business-Case-for-Sustainability-The-Integration-of-Social/Schaltegger-Wagner/p/book/9781874719953>

Shah, U. A. & Khan, I. M. (2019). HRM-Performance Perspectives: An Overview of Theoretical Challenges and Prospects. *Inzinerine Ekonomika-Engineering Economics*, 30(3), 382-393. <https://doi.org/10.5755/j01.ee.30.3.9550>

Spiro, C. (2006). Generation Y in the Workplace. Defense AT&L. Available from internet: http://washingtonandco.com/pdf/generation_y_workplace.pdf

Spišáková, A., Vraňáková, N., Koltnerová, K. & Chlpekova, A. (2016). Design of the implementation of concept of age management in industrial companies. *Fórum manažéra*, 12(2), 52-56.

Stacho, Z., Stachová K., Papula J., Papulová Z. and Kohnová L. (2019). Effective communication in organizations increases their competitiveness. *Polish Journal of Management Studies*. 19(1), 391-403. <https://doi.org/10.17512/pjms.2019.19.1.30>

Stachová, K., Stacho, Z., Cagáňová, D. & Stareček, A. (2020). Use of Digital Technologies for Intensifying Knowledge Sharing. *Applied Sciences*, 10(12), 4281. <https://doi.org/10.3390/app10124281>

Stýblo, J. (2008). Výkonnosť firiem (Company performance). *Moderní řízení*, 43(11), 1-25.

Sudbury-Riley, L., Kohlbacher, F. & Hofmeister, A. (2015). Baby Boomers of different nations: Identifying horizontal international segments based on self-perceived age. *International Marketing Review*, 32(3/4), 245-278. <https://doi.org/10.1108/IMR-09-2013-0221>

Šulák, M. & Vacík, E. (2005). *Měření výkonnosti podniku (Measuring business performance)*. Praha: Vysoká škola finanční a správní.

Sullivan, A., Brown, M. & Bann, D. (2015). Generation X enters middle age. *Longitudinal and Life Course Studies*, 6(2), 120-130. <http://dx.doi.org/10.14301/llds.v6i2.351>

Suryani, A., Pirzada, K. & Mufidah, M. (2018). Analysis of opportunistic behavior of management to company performance. *Polish Journal of Management Studies*. 18(1), 379-388. <https://doi.org/10.17512/pjms.2018.18.1.28>

Székely, F. & Knirsch, M. (2005). Responsible Leadership and Corporate Social Responsibility: Metrics for Sustainable Performance. *European Management Journal*, 23(6), 628-647. <https://doi.org/10.1016/j.emj.2005.10.009>

Tomčíková M. (2011). Výkonnosť-faktor úspešnosti organizácie (Performance - a factor in the success of an organization). Available from internet: <https://www.konference.fbm.vutbr.cz/workshop/papers/papers2011/ekonomika/Tomcikova.pdf>

Topolosky, P. S. (2000). *Linking Employee Satisfaction to Business Results*. Routledge, Garland Publishing.

United Nations (2020). *World Population Prospects 2019*. Available from internet: <http://esa.un.org/wpp/Sorting-Tables/table-sorting-ageing.htm>

Veber, J. (2001). *Management. Základy, prosperita, globalizace (Management. Basics, prosperity, globalization)*. Praha: Management Press.

Wagner, J. (2009). *Měření výkonnosti. Jak měřit, vyhodnocovat a využívat informace o podnikové výkonnosti (Performance measurement. How to measure, evaluate and use information about business performance)*. Praha: Grada Publishing.

Závadská, Z. & Závadský, J. (2014). *Integrácia procesného manažmentu do systému riadenia podniku (Integration of process management into the business management system)*. Bratislava: Slovenský komitét pre vedecké riadenie ZSVTS.

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DIGITAL ECONOMY: TECHNOLOGICAL, ORGANIZATIONAL AND CULTURAL CONTEXTS FOR THE DEVELOPMENT OF COOPERATION IN EUROPE*

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Abstract. This study aims at assessing the influence of Digital Economy on socio-economic contexts in Europe. Specifically, the assessment of this relationship was developed by performing a statistical regression analysis and by considering, on the one hand, for digital aspects, the Digital Economy and Society Index (DESI), and on the other hand, four socioeconomic indexes (Social Progress Index, Corruption Perception Index, Global Innovation Index, Doing Business). The study measures the potential existence of a correlation between DESI and its dimensions and every of the four socio-economic indexes also evaluating the characteristics of those correlations. Additionally, the analysis identifies the foremost influential DESI dimensions to supply the digital leverage within which to focus so as to reinforce socio-economic position. The results showing the correlations and therefore the intensity between the variable considered, highlight the influence of a number of them because the most effective digital levers that European countries should address so as to aspire the achievement of satisfactory leads to the socio-economic context.

Keywords: digital economy; Europe; quantitative analysis; cooperation

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JEL Classifications: L2, L26

1. Introduction

In the last twenty years, digital tools and in particular information and communication technologies (ICT) represented strategic pillars in the growth of the economic and social contexts. The high speed of technological innovations requires continuous and repeated changes to organizational (Marino et al., 2020), cultural, socio-economic, and political contexts. Such changes are no longer produced by an evolutionary innovation, that generates incremental advances in both technologies and processes (Garud et al., 2013) but, as in the case of digitization, the innovation is identified as disruptive (Vossen et al., 2017). This last kind of innovation brings deep changes and improvements that are different from previous ones (Li et al., 2018). Such kind of innovation brought deep changes in the business' patterns improving their long-term competitiveness, profitability, and

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growth (Fransman, 2014). The innovation has many social consequences: it improves the products and services provided by a business, guarantees its success and growth, and consequently the employment. Furthermore, innovation increases the infrastructural quality of the geographical areas, consequently improving the well-being of their communities (Capone et al., 2020).

Therefore, in an era characterized by phenomena of rapid obsolescence of goods and services, countries' ability to manage technological innovations becomes strategic, implementing adaptive behaviors concerning the changes that their external reference environment can produce (Hagsall et al., 2019). Digitization is one of the most influential drivers of innovation (Rachinger et al., 2019). In particular, digital innovation (Marino et al., 2021) represents a paradigm that offers the possibility of interaction without any temporal and territorial constraint, able to manage, even remotely, products and services, as well as to analyze and manage huge amounts of data on the economic markets.

Europe has always taken up the challenge of digitization change since 1994, with the Bangemann Report (1994), which placed the innovations determined by the Information and Knowledge Society at the center of the transformation processes (Burch, 2006). Digital innovation was identified as a fundamental driver of market development because it was able to address 3 fundamental challenges in Europe at that time: poor innovation, slow growth, high unemployment. These issues were addressed and deepened in the Lisbon 2000 agenda in which the use of information technologies and the Internet were represented as an essential tool to improve the quality of government actions and consequently the quality of services for citizens and businesses (Di Martino et al, 2019). More recently, the European Commission launched in March 2010, the Europe 2020 strategy to emerge from the economic crisis and prepare the EU economy for the challenges of the next decade. One of the seven flagship initiatives of the Europe 2020 strategy is the Digital Agenda for Europe and aimed at establishing the key role of the digital economy in achieving the goals set for 2020 (European Commission, 2010). The European Digital Agenda identifies more than 100 actions to be implemented by the European Commission or by the individual Member States, and these actions are grouped into 7 main areas of intervention. Amongst these areas of intervention, there is the achieving of the Digital Single Market, identified by the European Commission (2017) as a strategic tool in the implementation of European digital growth that could contribute €415 billion per year to the EU economy and allow the creation of hundreds of thousands of new jobs. In the implementation of digitization processes, the disparities between European countries' capacities should be considered when devising and implementing future policies. In fact, during the last decade, each European country implemented differently, and at a different level, the designed digital political strategies. This different level of implementation in the digital policies countries consequently created great differences amongst them, producing the phenomenon of the digital divide (Marino et al., 2021). As discussed by the European Parliament in December 2015, reducing the digital divide between and within the European countries may raise EU Gross Domestic Product (GDP) by 1-1.5%. The creation over the last few years of a very heterogeneous digital European scenario has stimulated the European Union to identify the reduction of the digital divide and the need to measure the level of digitization of the Member States as strategic objectives for the EU Member States (Pérez-Morote et al., 2020). In line with this assumption, the different operative levels of digitization policies are affected by their economic and social contexts in terms of economic growth and social well-being (Park and Choi, 2019). Although many authors have focused on highlighting the importance of ICT on the economic and social development of countries, there are not many studies in the literature that evaluate this relationship through an approach based on the measurement of each of these aspects.

This study tries to create an accumulation of knowledge on this topic, assessing the influence of digitization on the socio-economic contexts in Europe. In particular, the assessment of this relationship has been elaborated considering, on the one hand, for the digital aspects the Digital Economy and Society Index (DESI) that represents the EU tool to measure the EU Member States digital performances. On the other hand, six socio-

economic indexes (Social progress Index, Corruption Perception Index, Global Innovation Index, Doing Business, have been identified.

In line with the scope of the paper, we measure the existence and the eventual characteristics of a correlation between DESI and each one of the four socio-economic indexes and thus evaluate the validity of the hypothesis. Furthermore, we identify the most influencing DESI dimensions, to provide a set of digital leverage in which invest to improve the socio-economic position.

This relationship between these two aspects (digital and socio-economic) has been analyzed with a statistical model that measures, through a linear regression model, the correlation level between the considered variables. The statistical model pointed out an EU digital scenario evaluating which digital leverages could better influence the social well-being and economic growth in the European context. Finally, the study elaborated a comparative analysis of the EU28 Member States' performances based on their digital and socio-economic improvements in the period 2016-2018 to validate the results on a statistical approach.

The paper is organized as follows: Section two outlines the conceptual background on the topic of the study. Moreover, Section 3 explains the elaborated methodology, and Section 4 displays the results and related discussion. Finally, Section 5 shows the conclusions of the paper.

2. Theoretical background

Digitization is key factor for the economic growth of the countries (Evangelista et al., 2014) that to create efficient digitization development processes needs to simultaneously consider several different aspects (Vironen & Kah, 2019). Several authors emphasized the different factors that contribute to enhancing digitization processes. Toader et al. (2018) elaborated a study aimed at identifying and evaluating the effectiveness of using ICT infrastructure on economic growth in the European Union (EU) countries. Furthermore, assessing the digital development of Romanian enterprises, Martin et al. (2013) underlined the role of human capital as one of the major factors of influence in enterprise digitization. Castellacci & Tveito (2018). developed a survey focusing on the main four channels that can shape well-being in everyday life (The change of time use patterns, the creation of new activities, they facilitate access to information, and acts as a powerful communication tool). They showed how these four channels impact well-being in distinct domains of life, underlining why the use of the Internet has diverse effects on individuals and social groups. Moreover, designing a quantitative study based on former qualitative research to prove main drivers of successful digitization aspects, Reichstein et al. (2018) conducted interviews with European experts to give empirical evidence of six factors (efficiency, innovation, data privacy, mobility, new business models and human integration) in influencing of the potential value of digitization in business. Finally, Lindgren et al. (2019) presented a review and discussion aimed at identifying how the digitalization of public services has affected the interaction between citizens and government and how this process can influence the development of society.

Besides, the digitization processes and in particular the ICT tools are extremely interconnected with several socio-economic aspects. They also increase social well-being contributing to the enhancement of social progress and the reduction of the digital divide on individuals and social groups (Büchi et al., 2018). Moreover, the digital tools can help the government in the contrast of the corruption improving the transparency of public actions, the monitoring of tax systems, the enhancement of the interaction between citizens and public administration (Fanea-Ivanovici et al., 2019). Some European countries have more benefit from digitization because they paid more attention to innovations and digital business environments. During the last years, these countries shifted their research activities from innovation systems to technological innovation systems.

At the macro level (Marino et al., 2021), the effects of digitization are not easily identifiable because normally the economic growth of a country is measured with national output in terms of Gross Domestic Product (GDP) (Degryse, 2016). Moreover, many studies focused on measuring and quantifying the digital divide (Vicente and Lopez, 2006; Billon et al, 2010; Vicente & López, 2011; Chetty et al., 2018). The multi-dimensional character of the digital divide has led to the creation and analysis of different ICT indexes. Hence the need to measure digital performance (Brynjolfsson, & Collis, 2019), evaluating the implementation level of the digital economy (Kehal & Singh, 2005), as well as the need to clearly understand the effects of ICT on the socio-economic path of the countries (Park & Choi, 2019). In this context, it is interesting to note that some public Institutions (OECD, European Commission, UNCTAD, World Bank) have drowned their attention in the elaboration of measuring models of the Digital economy (OECD, 2020)

3. Research objective and methodology

To evaluate if the digital performance of the EU Member State is correlated with their socio-economic conditions and how is when exists this correlation, the study elaborates a statistical model with a correlation analysis between indexes that includes both digital and socio-economic aspects. The model is also aimed at identifying which digital levers are most influential on the socio-economic performances.

Concerning the digital aspects, the study identifies DESI - Digital Economy and Society Index that is the tool adopted by the European Commission since 2014 to measure the degree of digitization of the digital economy and society of the various member countries of the Union and to follow its evolution over time. This composite index is composed of five dimensions: Connectivity, Human Capital, Use of Internet Services, Integration of Digital Technology, Digital Public Services.

In the assessment of the socio-economic contexts of the countries, the analysis includes four indexes. Two of these are more strictly linked to social aspects (Social Progress Index and Corruption Perception Index) and the other two are more respondents to the need of evaluating the economic conditions of the Member States (Global Innovation Index and Doing Business). In particular, Social Progress Index (SPI), elaborated by Social Progressive Imperative, evaluates the social and environmental performance of the various countries. It measures the capacity of a state to provide for the social and environmental needs of its citizens. Corruption perception Index (CPI) This index is the most used indicator of corruption worldwide. Each year, it scores countries “on how corrupt their public sectors are seen to be”, by measuring the perceived level of public sector corruption worldwide, on the base of expert opinion. It is published (starting from 1995) by Transparency International, an international non-governmental organization that has the purpose of fighting corruption. Global Innovation Index (GII) is a yearly index that ranks countries by their capacity for and success in innovation and, thus, it provides a rich dataset to analyze the global innovation trends. GII aims to capture the multi-dimensional facets of innovation and provides tools that can assist in tailoring policies to promote long-term output growth, improved productivity, and job growth. It is co-published by INSEAD (a famous graduate business school) the WIPO-World Intellectual Property Organization (a specialized agency of the United Nations) and Cornell University (US, NY), in partnership with other organizations, starting from 2008. It is based on both subjective and objective data derived from several sources. Doing Business (DB) measures the capabilities of the 190 countries analyzed in creating business. A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm. The rankings, published by The World Bank starting from 2014, are determined by sorting the aggregate distance to frontier scores, which benchmarks economies concerning regulatory best practice, showing the absolute distance to the best performance on each Doing Business indicator. Normalization was carried out for each index; it was performed using the min-max method, which consists of a linear projection of each index on a scale between 0 and 1:

$$z = \frac{x - \min(x)}{\max(x) - \min(x)}$$

Starting in the hypothesis testing we verify if is the existence of a linear relation between the DESI and the four different indexes, which can be described through a linear regression model (Figure 1):

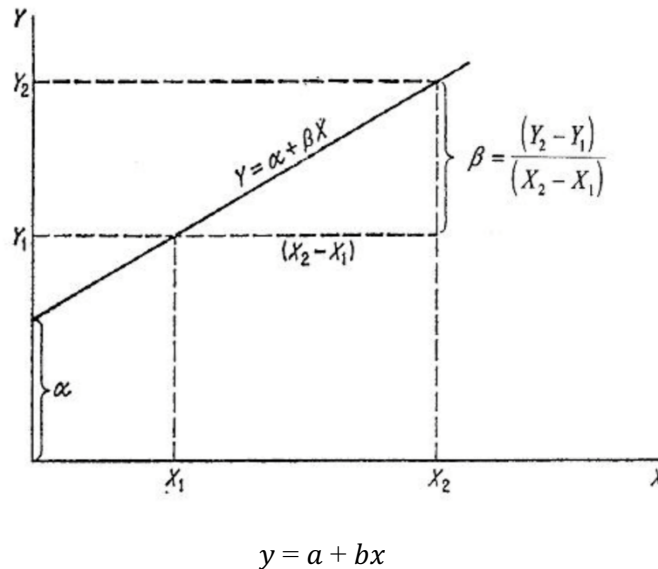


Figure 1. Linear regression model

where x is DESI and y the given socio-economic indicator.

Furthermore, the hypothesis has to be verified also in the correlation between the 5 sub-dimensions of DESI (Connectivity, Human Capital, Use Of Internet, Integration Of Digital Technology, Digital Public Services) and the given socio economic indicator.

The statistical validation of the model is made through the use of Pearson Coefficient (PCC or r) to evaluate the existence of the linear correlation between the variable.

$$r = \frac{Cov_{xy}}{s_x s_y}$$

The values of the coefficients range between -1 and 1. The closer the value of r gets to zero, the lower is the correlation, while the closer to 1 or -1, the higher is the correlation. We assume in line with literature (Asuero et al., 2006) that the relationship is considered a:

- Strong correlation: 0.5 to 1.0 or -0.5 to -1.0.
- Moderate correlation: 0.3 to 0.5 or -0.3 to -.5.
- Weak correlation: 0.1 to 0.3 or -0.1 to -0.3.

Moreover, the study analyses the values of Coefficient of Determination to evaluate how differences in one variable can be explained by a difference in a second variable and it gives you an idea of how many data points

fall within the results of the line formed by the regression equation. It is calculated as a ratio between residual sums, in the case of linear regression it corresponds with the square of the Pearson Coefficient ($R^2 = r^2$). Hence, it can define how strong is the model obtained through linear regression. It assumes values from 0 to 1. The higher the coefficient, the higher percentage of points the regression line passes through. From the literature, we will consider the model and the intensity of correlation as acceptable if the coefficient is at least $R^2 > 0,4$ (Kvålseth, 1985).

To validate that the hypothesis formulated is confirmed and to verify if the proposed regression model fits well with the data, the study applies a Student's T-test and a Fischer F-test respectively. In our case, we will reject the hypothesis (and therefore we will confirm the correlation) if the p-value of the t-Student test on the coefficient b is significantly lower than 0.01 by at least two other decimal places (Snedecor & Cochran, 1980). Moreover, we assume that the model fits well when the value of F is significantly greater than 10 taking into account the critical values of the distribution of F indicated in the table taking into account the alpha value, the sample size, and the degrees of freedom (Snedecor & Cochran, 1980). The collected data were statistically analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0.

The study to identify the digital levers more influent on socio-economic indexes. It first identifies the PCC value and then evaluates the value of the coefficient b (slope of the regression line) considering that the evaluation of the influence of the independent variable on the dependent one implies identifying how much a digital improvement is connected to an improvement in a given socio-economic index.

Finally, to validate the statistical model, based on the study carries out a comparative analysis identifying the top 5 countries that show the greatest delta in terms of improvements in digital performance (i.e. DESI and its dimensions) and socio-economic, and vice versa, the 5 countries that show the minor delta in terms of improving both digital and socio-economic performance. By this definition, we mean the five countries that achieved this best and/or worst performance in the period 2017-2019.

The aim is to check whether major and minor socio-economic improvements belong to major and minor digital improvements respectively.

4. Results and Discussion

In this section, for each of the four socio-economic indexes, their relationship with the DESI and its dimensions have been analyzed separately. The analysis starts by taking into consideration the social context through the assessment of the correlation with the Social Progress Index (SPI) and, subsequently, with the Corruption Perception Index (CPI). The analysis on the relationship of the economic context will then follow, through the assessment of the correlation with the Global Innovation Index (GII) and with the Doing Business (DB) (Figures 2,3,4,5,6).

It should be noted that one of the research outputs is to highlight any correlations and consequently identify their main characteristics, both concerning DESI, as a composite index, and concerning its individually identified dimensions.

Social Progress Index

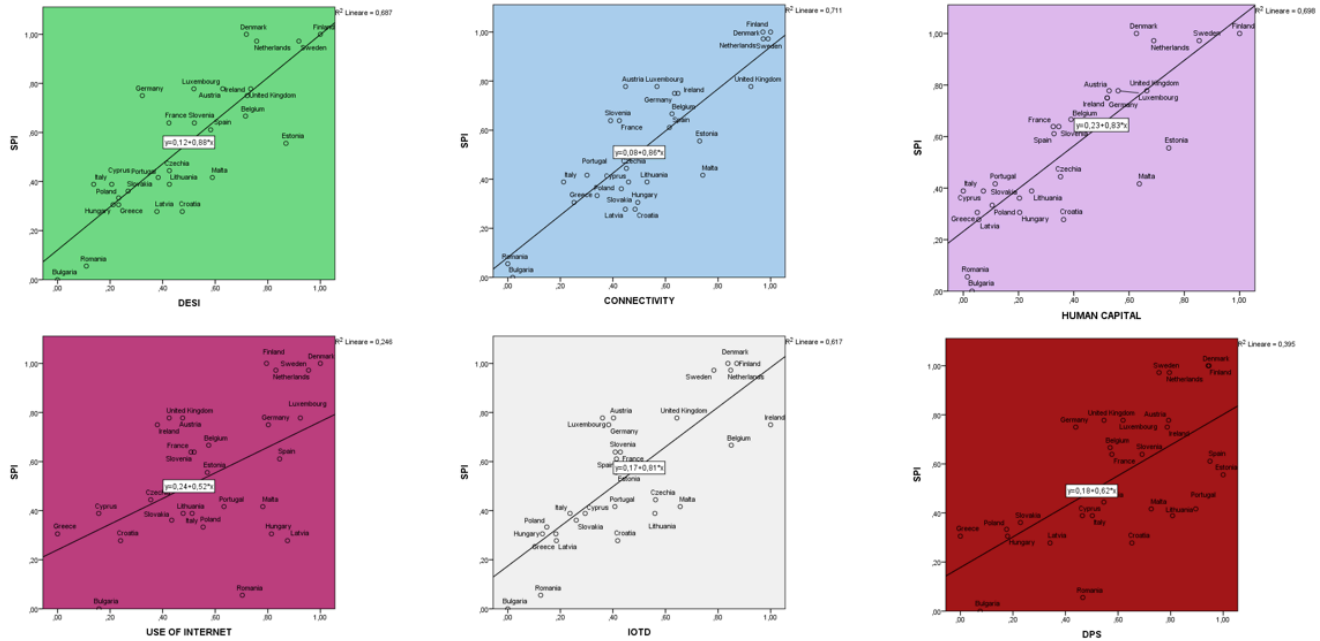


Figure 2. DESI vs SPI

Source: Our elaboration

Table 1. DESI vs SPI

Regression Statistic						
	DESI vs SPI	Conn. vs SPI	HC vs SPI	UoI vs SPI	IoTDT vs SPI	DPS vs SPI
Correlation	0,828655369	0,843403705	0,835585864	0,495728612	0,785228525	0,628693362
Determination	0,686669721	0,71132981	0,698203737	0,245746857	0,616583837	0,395255343

	F	p-value
DESI vs SPI	56,97953222	0,0000000517
Conn. vs SPI	64,06818462	1,75134E-08
HC vs SPI	60,15083479	3,14838E-08
UoI vs SPI	8,471185489	0,007305065
IoTDT vs SPI	41,81143446	0,000000075
DPS vs SPI	16,99335214	0,000339621

b Coefficient	lower 95%	upper 95%
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<i>DESI vs SPI</i>	0,878016226	0,638923258	1,117109193
<i>Conn. vs SPI</i>	0,858433107	0,637983692	1,078882522
<i>HC vs SPI</i>	0,830063153	0,610067547	1,05005876
<i>UoI vs SPI</i>	0,522707322	0,153551103	0,89186354
<i>IoDT vs SPI</i>	0,808894484	0,551755431	1,066033538
<i>DPS vs SPI</i>	0,623797587	0,312749265	0,934845909

Source: Our elaboration

Corruption Perception Index

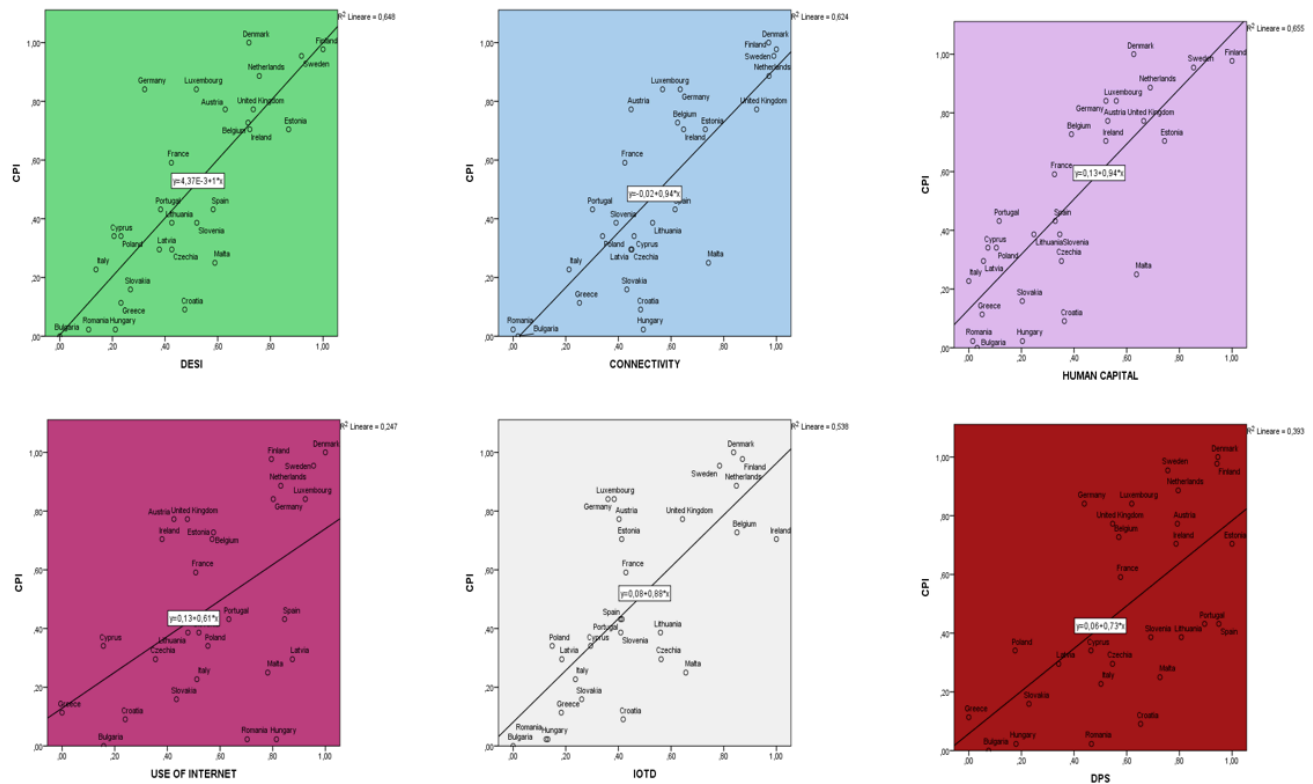


Figure 3. DESI vs CPI

Source: Our elaboration

Table 2. DESI vs CPI

<i>Regression Statistic</i>						
	<i>DESI vs CPI</i>	<i>Conn. vs CPI</i>	<i>HC vs CPI</i>	<i>UoI vs CPI</i>	<i>IoDT vs CPI</i>	<i>DPS vs CPI</i>
<i>Correlation</i>	0,804749584	0,789703445	0,809543494	0,496597362	0,733388115	0,62655288
<i>Determination</i>	0,647621893	0,623631531	0,655360668	0,24660894	0,537858128	0,392568511

	<i>F</i>	<i>p-value</i>
<i>DESI vs CPI</i>	47,78437955	2,44142E-07
<i>Conn. vs CPI</i>	43,0812385	5,84591E-07
<i>HC vs CPI</i>	49,44118619	1,8195E-07
<i>UoI vs CPI</i>	8,510629861	0,007187203
<i>IoDT vs CPI</i>	30,25977987	9,00602E-06
<i>DPS vs CPI</i>	16,80318105	0,000360817

	<i>b Coefficient</i>	<i>lower 95%</i>	<i>upper 95%</i>
<i>DESI vs CPI</i>	0,995565145	0,699525136	1,291605154
<i>Conn. vs CPI</i>	0,938459027	0,64456218	1,232355874
<i>HC vs CPI</i>	0,938945895	0,66446013	1,213431661
<i>UoI vs CPI</i>	0,611363259	0,180596498	1,042130021
<i>IoDT vs CPI</i>	0,88208412	0,552473783	1,211694456
<i>DPS vs CPI</i>	0,725843306	0,361868919	1,089817693

Source: Our elaboration

Global Innovation Index

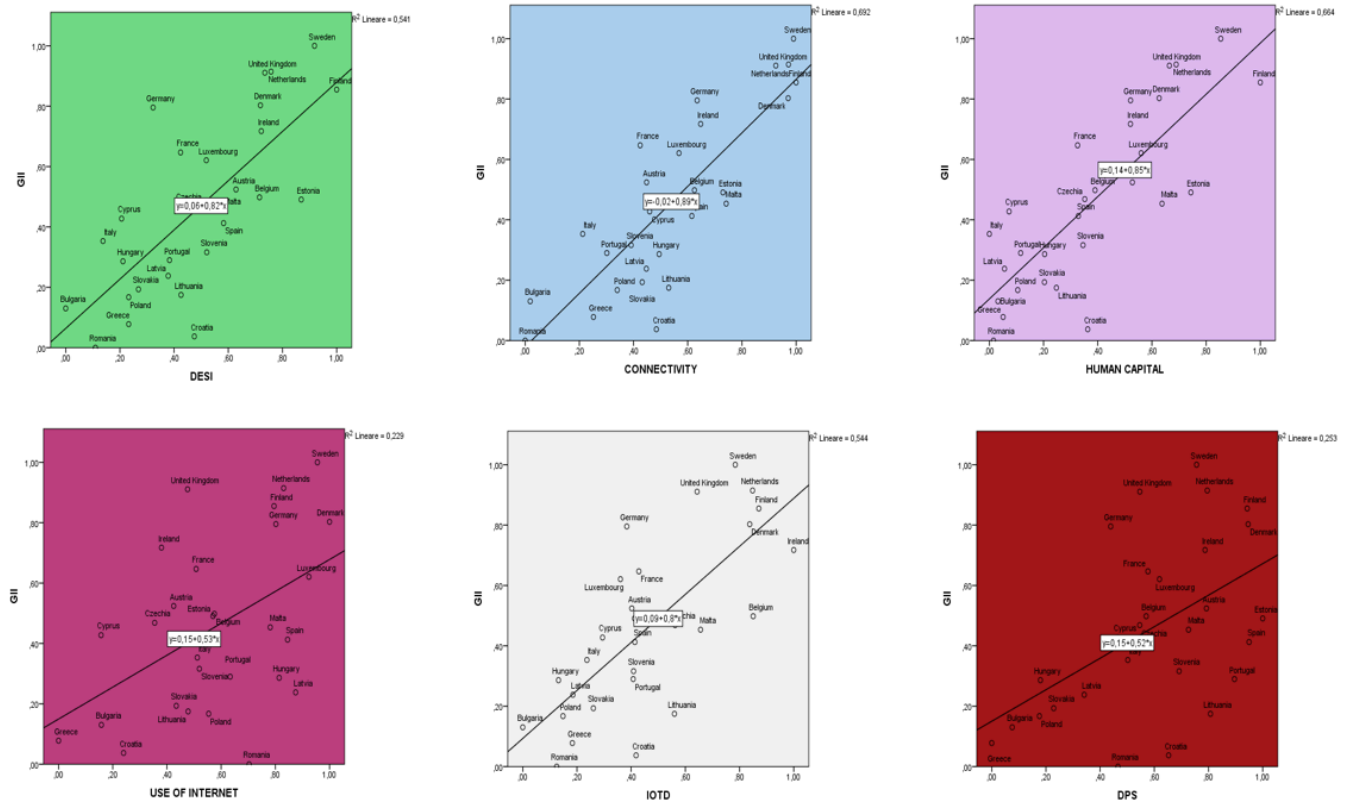


Figure 4. DESI vs GII

Source: Our elaboration

Table 3. DESI vs GII

Regression Statistic						
	DESI vs GII	Conn. vs GII	HC vs GII	UoI vs GII	IoDT vs GII	DPS vs GII
Correlation	0,735216072	0,831631891	0,815102037	0,478878013	0,73762337	0,502679706
Determination	0,540542672	0,691611602	0,664391331	0,229324152	0,544088236	0,252686887

	F	p-value
DESI vs GII	30,58849782	0,00000833
Conn. vs GII	58,30926764	4,18739E-08
HC vs GII	51,4711812	1,28046E-07
UoI vs GII	7,736622288	0,009934928
IoDT vs GII	31,02857891	7,51094E-06
DPS vs GII	8,791307074	0,006406108

	<i>b</i> Coefficient	lower 95%	upper 95%
<i>DESI vs GII</i>	21,93755683	13,78426692	30,09084674
<i>Conn. vs GII</i>	0,886123966	0,647590461	1,124657472
<i>HC vs GII</i>	0,847665336	0,604799707	1,090530965
<i>UoI vs GII</i>	0,528605757	0,137962896	0,919248619
<i>IoDT vs GII</i>	0,795468282	0,501929407	1,089007158
<i>DPS vs GII</i>	0,52214192	0,160161118	0,884122722

Source: Our elaboration

Doing Business

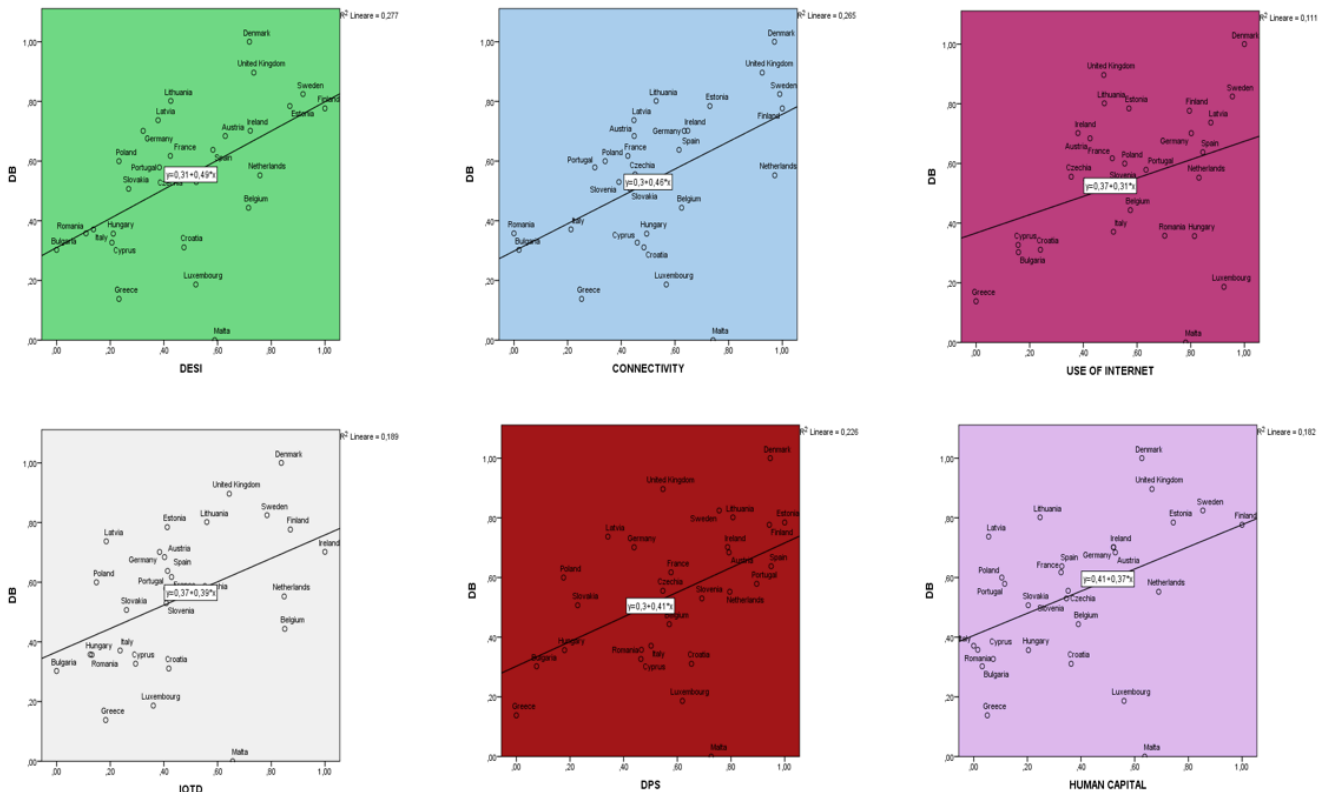


Figure 5. DESI vs DB

Source: Our elaboration

Table 4. DESI vs DB

<i>Regression Statistic</i>						
	<i>DESI vs DB</i>	<i>Conn. vs DB</i>	<i>HC vs DB</i>	<i>UoI vs DB</i>	<i>IoDT vs DB</i>	<i>DPS vs DB</i>
<i>Correlation</i>	0,526224679	0,514439641	0,426426247	0,33285037	0,43451372	0,47525313
<i>Determination</i>	0,276912412	0,264648145	0,181839344	0,11078937	0,18880218	0,22586554

	<i>F</i>	<i>p-value</i>
<i>DESI vs DB</i>	9,956916484	0,00402236
<i>Conn. vs DB</i>	9,357223638	0,005098142
<i>HC vs DB</i>	5,778599724	0,023645878
<i>UoI vs DB</i>	3,239416575	0,083501901
<i>IoDT vs DB</i>	6,051368028	0,020858802
<i>DPS vs DB</i>	7,585896729	0,010593723

	<i>b Coefficient</i>	<i>lower 95%</i>	<i>upper 95%</i>
<i>DESI vs DB</i>	0,154791706	0,17025985	0,806617668
<i>Conn. vs DB</i>	0,458686223	0,15046262	0,766909825
<i>HC vs DB</i>	0,371085764	0,053773624	0,688397905
<i>UoI vs DB</i>	0,30744962	-0,043677409	0,658576649
<i>IoDT vs DB</i>	0,392111535	0,064464278	0,719758792
<i>DPS vs DB</i>	0,41308566	0,104795008	0,721376313

Source: Our elaboration

Doing Business without outliers

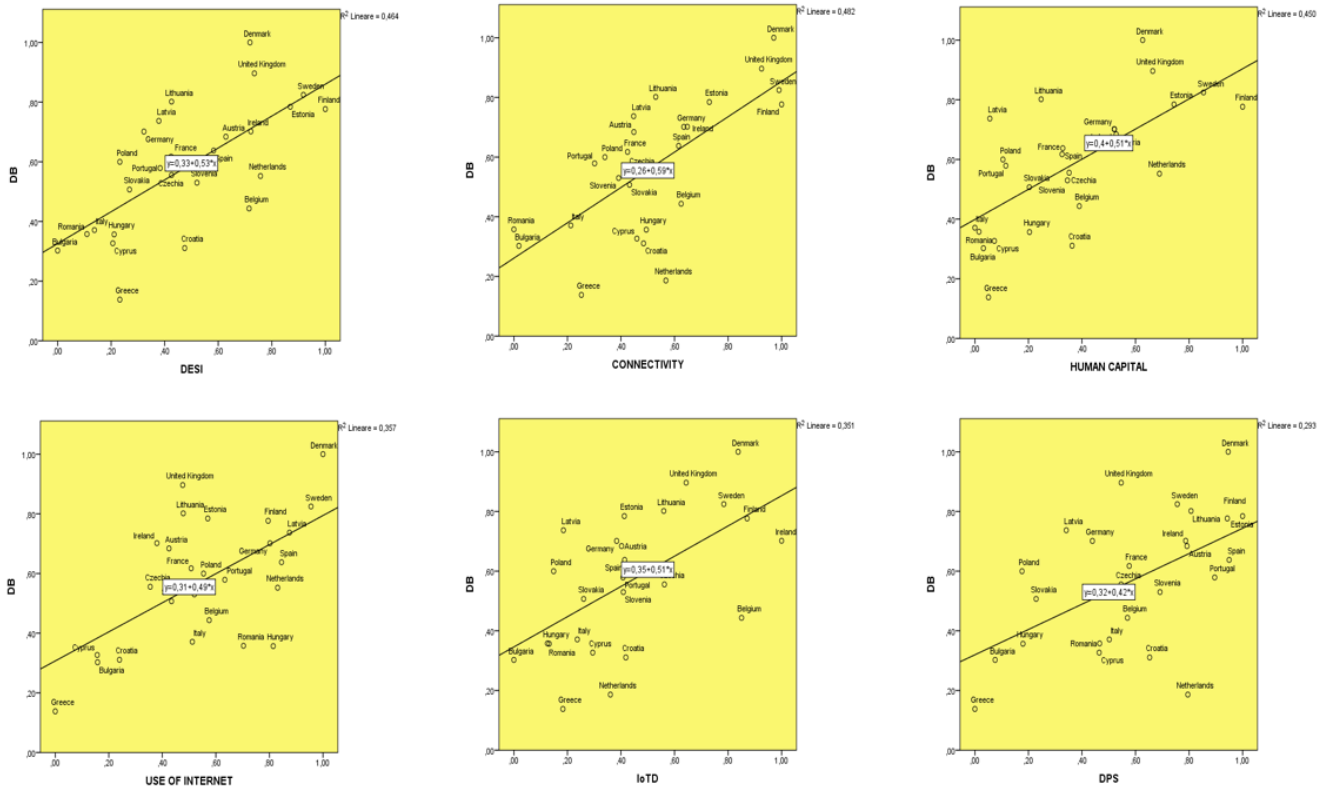


Figure 6. DESI vs DB without outliers

Source: Our elaboration

Table 5. DESI vs DB without outliers

Regression Statistic						
	DESI vs DB	Conn. vs DB	HC vs DB	UoI vs DB	IoDT vs DB	DPS vs DB
Correlation	0,681071405	0,694185912	0,694185912	0,597541237	0,592415441	0,541472735
Determination	0,463858258	0,48189408	0,48189408	0,35705553	0,350956055	0,293192723

	F	p-value
DESI vs DB	20,76428179	0,000128184
Conn. vs DB	22,32257434	8,3629E-05
HC vs DB	19,65973665	0,000175218
UoI vs DB	13,32826259	0,001266773
IoDT vs DB	12,97746537	0,001428957
DPS vs DB	9,955507787	0,004279409

	<i>b Coefficient</i>	<i>lower 95%</i>	<i>upper 95%</i>
<i>DESI vs DB</i>	0,534209403	0,292250605	0,776168202
<i>Conn. vs DB</i>	0,592501492	0,333676828	0,851326155
<i>HC vs DB</i>	0,505057261	0,269964033	0,740150489
<i>UoI vs DB</i>	0,487351983	0,211837575	0,762866391
<i>IoDT vs DB</i>	0,506939475	0,216504095	0,797374855
<i>DPS vs DB</i>	0,424079377	0,146681078	0,701477675

Source: Our elaboration

From the regression analysis implemented, a general framework emerges in which the correlations are all positive, therefore the model obtainable through linear regression assumes that on average an improvement of 1 decimal point of the digital variables translates into an increase in the socio-economic indices corresponding to the value of coefficient *b*. In this context the most correlated measures are the Social Progress Index in particular for the digital variables DESI ($r = 0.828$; $r^2 = 0.686$), Connectivity ($r = 0.843$; $R^2 = 0.711$), Human Capital ($r = 0.835$; $R^2 = 0.698$), and Digital Technology ($r = 0.785$; $R^2 = 0.611$). Moreover, also the Corruption Perception Index displays a strong correlation for the digital variables DESI ($r = 0.04$; $r^2 = 0.647$), Connectivity ($r = 0.789$; $R^2 = 0.623$), Human Capital ($r = 0.809$; $R^2 = 0.655$), and Digital Technology ($r = 0.733$; $R^2 = 0.537$) as shown in fig. n. 2 and fig. n. 3.

The least correlated measure appears to be Doing Business for which there are levels of correlation that are acceptable but lower than the other socio-economic indices considered. In particular, the best correlations for this index emerged for the digital variables DESI ($r = 0.681$; $r^2 = 0.463$), Connectivity ($r = 0.694$; $R^2 = 0.481$), Human Capital ($r = 0.694$; $R^2 = 0.481$). It should be noted that for this socio-economic index the regression analysis in the first instance highlighted the lack of correlation for all digital variables Fig. 5. Starting from the analysis of the results and the dispersion graphs, the presence of critical values for Malta and Luxembourg emerged in all correlations (fig.5). The CPI also includes, within its methodology, the territorial extension of the countries among its components, and therefore countries that have a smaller territorial extension could be penalized in terms of performance for the Doing Business and consequently also for its correlation. In light of these results, the regression analysis was processed again by eliminating the outliers showing the results above mentioned and shown in Figure 6 and Table 5.

The p-value and F values for all digital variables (Tables 1, 2, 3, 4, 5) confirmed the suitability of the regression and model. Correlation/Ranking is presented in Figure 7 below.

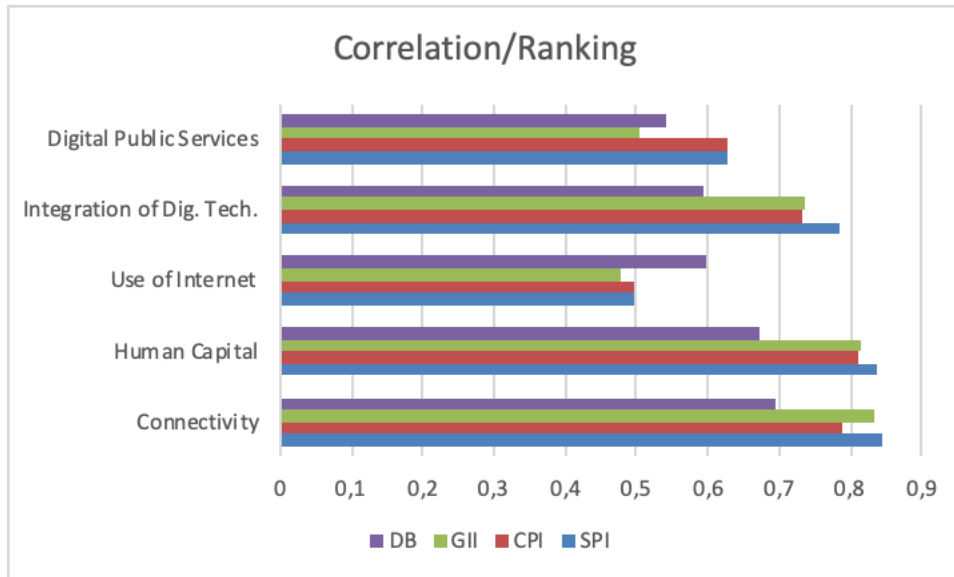


Figure 7. Correlation/Ranking

Source: Our elaboration

Changing the analysis perspective and evaluating the most influential digital levers, the results show that the three dimensions that express a greater leverage effect on socio-economic indices are Connectivity, Human Capital, and Integration of Digital Technology. This could mean that these dimensions represent the drivers on which the Member States, according to the statistical model, should invest more to accelerate and increase their socio-economic development. Therefore, the reduction of any digital divide concerning these results could be reduced through investments aimed at the development of citizens' digital skills, the creation of infrastructures with a high level of digitization, and the improvement of existing ones to bring them in line with the development. evolution of digital technological innovations and facilitate the digitalization process of companies.

Comparative analysis



Figure 8. Comparative Analysis

Source: Our elaboration

The comparative analysis between the countries that show the lowest performance in terms of improvement in the period considered highlights a scenario in which there are countries that, in the face of a low delta in terms of digital performance, express in analogy, at least partially, a low also in socio-economic terms (Figure 8). The reasons behind these results differ according to the country analyzed. The presence of countries such as Denmark (Use of Internet 0.03; Digital Public Services 0.10; Social Progress Index 0.10; Global Innovation Index 0.01), Netherlands (DESI 0.01; Human Capital 0.01; Doing Business 0.07) and Sweden (Integration of Digital Technology 0.08; Digital Public Services 0.01; Social Progress Index 0.10) is attributable to the fact that these Member States rank in absolute terms on performance levels both digital and socio-economic very high and therefore the increases in terms of improvement over the last few years are very low. On the contrary, the presence in this context of countries such as Bulgaria (DESI 0.06; Human Capital 0.06; Corruption Perception Index 0.06; Doing Business 0.04) and Latvia (Human Capital 0.03; Use of Internet 0, 01; Social Progress Index 0.07; Doing Business 0.04) highlights the difficulty of follower countries in the European context that are not able to reduce the distance from the best countries both in digital terms and in terms of economic growth and social well-being.

In line with what is shown in the comparison between the "worst" countries, the data relating to the comparative analysis between the countries that show the highest performance in terms of improvement show a scenario with the presence of profiles of countries with high deltas both in terms of digital performance both in socio-economic terms. In this case, the reasons are related to the presence of countries such as Slovakia (DESI 0.32; Human Capital 0.28; Use of Internet 0.27; Integration of Digital Technology 0.36; Social Progress Index 0.33; Corruption Perception Index -0.04; Global Innovation Index 0.04), Czech Republic (DESI 0.53; Human Capital 0.40; Use of Internet 0.23; Corruption Perception Index -0.04; Global Innovation Index 0.05) and Romania (DESI 0.28; Social Progress Index; 0.37; Corruption Perception Index -0.09; Global Innovation Index 0.06;) which are included in the least developed countries in the EU and therefore enjoy a greater room for growth both in digital and economic terms, also supported by EU economic policies for incoming countries.

The scenarios above described support the results of the statistical correlation test highlighting the probable digital lever function of DESI and its dimensions on the socio-economic context of European countries.

Conclusions

The paper highlighted the high evolutionary speed of technological innovations and the innovative trajectories that it imposes in terms of continuous and repeated changes that are inevitably reflected in organizational, cultural, socio-economic and political models. These changes are no longer product or process, incremental or evolutionary, but, in the case of digitalization, innovation is identified as disruptive, that is, it brings profound changes and improvements that are totally different from previous ones. Therefore, in the thesis, the theme of an era characterized by phenomena of rapid obsolescence of goods and services, also due to the current health and economic experience we are experiencing, becomes strategic, both concerning the ability to manage technological innovations to be part of the countries, implementing adaptive behaviors in relation to the changes that their external reference environment is capable of producing, which respond to the socio-economic uncertainties that must be faced and resolved.

This study from a theoretical point of view in relation to the topic of digital economy processes and its related effects, has contributed to provide useful tools for identifying any correlations and linear relationship models between the digital context and the socio-economic dimension of countries. In the European context, it has not directly focused on assessing the direct economic growth of countries but has taken into consideration a broader reference framework including aspects of society, such as the ability to create business and innovation by companies, the presence of corruption in government bodies and the social and environmental development of countries. In this line of research, the study focused, among other things, on finding answers to some research questions. Specifically, in carrying out a comparative analysis of the digital positions of European countries, the research aimed to assess the existence of a possible correlation and the relative level of significance between the level of digitization and the socio-economic situation in the context European. In addition, the analysis aimed to identify the most influential digital levers on the socio-economic aspects of the 28 European Member States. Following this approach, the study showed a series of correlations between the level of digitization and the four socio-economic indices considered (SPI, CPI, GII, DB), always showing positive correlations. This condition has resulted in scenarios in which socio-economic improvements are positively influenced by digital improvements. The results showed that digital dimensions showed correlations and intensity with socio-economic indices, highlighting some of them as the most effective digital levers (Human Capital, Connectivity, Integration of Digital Technology) on the aforementioned socio-economic indices.

Following this approach, in the European context, countries should operate mainly on the digital dimensions, which have emerged as the most effective, to aspire to obtain satisfactory results in the socio-economic context.

Investments in technologically advanced infrastructures are also identified in this strategic analysis for overcoming the digital divide and the development of basic and advanced digital skills, as well as for supporting digital innovation for businesses and PA.

References

- Asuero, A. G., Sayago, A., & Gonzalez, A. G. (2006). The correlation coefficient: An overview. *Critical reviews in analytical chemistry*, 36(1), 41-59. <http://dx.doi.org/10.1080/10408340500526766>
- Bangemann, M. (1994). *Recommendations to the European Council: Europe and the global information society*. Brussels: European Commission.
- Billon, M., Lera-Lopez, F., & Marco, R. (2010). Differences in digitalization levels: a multivariate analysis studying the global digital divide. *Review of World Economics*, 146(1), 39-73. <https://doi.org/10.1007/s10290-009-0045-y>
- Brynjolfsson, E., & Collis, A. (2019). How should we measure the digital economy. *Harvard Business Review*, 97, 140-148.
- Büchi, M., Festic, N., & Latzer, M. (2018). How social well-being is affected by digital inequalities. *International Journal of Communication*, 12, 21
- Burch, S. (2006). *The Information society—the knowledge society*.
- Capone, V., Marino, L., & Donizzetti, A. R. (2020). The English Version of the Health Profession Communication Collective Efficacy Scale (HPCCE Scale) by Capone and Petrillo (2012). *European Journal of Investigation in Health, Psychology and Education*, 10(4), 1065-1079. <https://doi.org/10.3390/ejihpe10040075>
- Carlsson, B., & Stankiewicz, R. (1991). On the nature, function and composition of technological systems. *Journal of evolutionary economics*, 1(2), 93-118. <https://doi.org/10.1007/BF01224915>
- Castellacci, F., & Tveito, V. (2018). Internet use and well-being: A survey and a theoretical framework. *Research policy*, 47(1), 308-325. <https://doi.org/10.1016/j.respol.2017.11.007>
- Chetty, K., Qigui, L., Gcora, N., Josie, J., Wenwei, L., & Fang, C. (2018). Bridging the digital divide: measuring digital literacy. *Economics: The Open-Access, Open-Assessment E-Journal*, 12(2018-23), 1-20. <https://doi.org/10.5018/economics-ejournal.ja.2018-23>
- Degryse, C. (2016) Digitalisation of the economy and its impact on labour markets, Available at SSRN: <https://ssrn.com/abstract=2730550>
- Di Martino, B., Marino, A., Rak, M., & Pariso, P. (2019, July). Optimization and validation of eGovernment business processes with support of semantic techniques. In *Conference on Complex, Intelligent, and Software Intensive Systems* (pp. 827-836). Springer, Cham. https://doi.org/10.1007/978-3-030-22354-0_76
- European Commission. (2010), *Towards Interoperability for European Public Services*, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2010) 744 final, Brussels, 16 December.
- European Commission. (2010). *Europe's Digital Competitiveness Report*.
- European Commission. (2013). *Unlocking the ICT growth potential in Europe: Enabling people and businesses*. Directorate-General of Communications Networks, Content & Technology. European Commission. (2015). Eurostat - E-business integration. From http://ec.europa.eu/eurostat/statistics-explained/index.php/E-business_integration
- European Commission. (2014), *Measuring Digital Skills across the EU: EU wide indicators of Digital Competence*, Report by DG Connect F4 in relation to action 62 of the Digital Agenda, May.
- European Commission. (2015). <https://ec.europa.eu/digital-single-market/europeana-european-digital-library-all>

European Commission. (2016). DESI 2016 Digital Economy and Society Index - Methodological note.

European Commission. (2016). Eurostat - National accounts and GDP. From http://ec.europa.eu/eurostat/statistics-explained/index.php/National_accounts_and_GDP#Main_GDP_aggregates

European Commission. (2016). http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_it.html

European Commission. (2016). <https://ec.europa.eu/digital-single-market/digital-agenda-europe>

European Commission. (2016). <https://ec.europa.eu/digital-single-market/en/audiovisual-media-services-directive-avmsd>

European Commission. (2017). <https://ec.europa.eu/digital-single-market/en/digital-skills-jobs-coalition> European Commission. (2017). <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

European Commission. (2017). <https://ec.europa.eu/digital-single-market/en/digital-single-market>

European Commission. (2017). <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

European Commission. (2020). Europe's Digital Competitiveness Report.

European Parliament and the Council (2006), Recommendation on key competences for lifelong learning of December 18th (2006/962/EC).

European Parliament. (2015). Broadband infrastructure. Supporting the digital economy in the European Union. From [http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/565891/EPRS_IDA\(2015\)565891_EN](http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/565891/EPRS_IDA(2015)565891_EN)

European Parliament. (2015). Broadband infrastructure. Supporting the digital economy in the European Union. From [http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/565891/EPRS_IDA\(2015\)565891_EN](http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/565891/EPRS_IDA(2015)565891_EN)

Evangelista, R., Guerrieri, P., & Meliciani, V. (2014). The economic impact of digital technologies in Europe. *Economics of Innovation and New Technology* 23:8, 802-824.

Fanea-Ivanovici, M., Muşetescu, R. C., Pană, M. C., & Voicu, C. (2019). Fighting Corruption and Enhancing Tax Compliance through Digitization: Achieving Sustainable Development in Romania. *Sustainability*, 11(5), 1480

Fransman, M. (2014). Models of innovation in global ICT firms: The emerging global innovation ecosystems. JRC Science and Policy Raport, University of Edinburgh

Garud, R., Tuertscher, P., & Van de Ven, A. H. (2013). Perspectives on innovation processes. *Academy of Management Annals*, 7(1), 775-819. <https://doi.org/10.1080/19416520.2013.791066>

Hagsall, A. E., Ahituv, N., & Naveh, N. (2019). Effective assimilation of technological innovation in an organization characterized as a Complex Adaptive System. *Journal of Innovation Management*, 7(2), 38.

Heeks, R. (2010). Do information and communication technologies (ICT) contribute to development? *Journal of International Development*, 22(5), 625-640, <https://doi.org/10.1002/jid.1716>

Kehal, H. S., & Singh, V. P. (Eds.). (2005). *Digital Economy: impacts, influences, and challenges*. IGI Global.

Kvålseth, T. O. (1985). Cautionary note about R 2. *The American Statistician*, 39(4), 279-285.

Li, M., Porter, A. L., & Suominen, A. (2018). Insights into relationships between disruptive technology/innovation and emerging technology: A bibliometric perspective. *Technological Forecasting and Social Change*, 129, 285-296. <https://doi.org/10.1016/j.techfore.2017.09.032>

Lindgren, I., Madsen, C. Ø., Hofmann, S., & Melin, U. (2019). Close encounters of the digital kind: A research agenda for the digitalization of public services. *Government Information Quarterly*, 36(3), 427-436.

- Marino, A., & Pariso, P. (2021). E-tourism: How ICTs Help the Local Tourist District Drive Economic Vitality. The Case of Campania, Italy. *International Journal of Innovation and Technology Management (IJITM)*, 18(03), 1-25.
- Marino A. & Pariso P. (2021). The global macroeconomic impacts of covid-19: four European scenarios. *Academy of Strategic Management Journal*, 20(2), 1-21.
- Marino, A., & Pariso, P. (2021). Human resource management in public transports: organizational typologies and research actions. *VINE Journal of Information and Knowledge Management Systems*. <https://doi.org/10.1108/VJKMS-01-2021-0006>
- Martin, F. M., Ciovica, L., & Cristescu, M. P. (2013). Implication of Human Capital in the Development of SMEs through the ICT Adoption. *Procedia Economics and Finance*, 6, 748-753.
- Meijers, H. (2014). Does the internet generate economic growth, international trade, or both? *International Economics and Economic Policy*, 11(1-2), 137–163. <https://doi.org/10.1007/s10368-013-0251-x>
- Nadeem, A. et al. (2018). Digital transformation & digital business strategy in electronic commerce-the role of organizational capabilities. *Journal of theoretical and applied electronic commerce research*, 13(2), 1–8. <https://doi.org/10.4067/S0718-18762018000200101>
- Negreiro M. & Madiega T. (2019). Digital transformation, EPRS - European Parliamentary Research Service, retrieved from [https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633171/EPRS_BRI\(2019\)633171_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633171/EPRS_BRI(2019)633171_EN.pdf)
- OECD, 2020. A roadmap toward a common framework for measuring the digital economy. Report for the G20 Digital Economy Task Force. Saudi Arabia. Retrieved from <http://www.oecd.org/sti/roadmap-toward-a-common-framework-for-measuring-the-digital-economy.pdf>
- Park, H., & Choi, S. O. (2019). Digital innovation adoption and its economic impact focused on path analysis at national level. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(3), 56. <https://doi.org/10.3390/joitmc5030056>
- Park, H., & Choi, S. O. (2019). Digital innovation adoption and its economic impact focused on path analysis at national level. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(3), 56
- Pérez-Morote, R., Pontones-Rosa, C., & Núñez-Chicharro, M. (2020). The effects of e-government evaluation, trust and the digital divide in the levels of e-government use in European countries. *Technological Forecasting and Social Change*, 154, 119973.
- Pradhan, R. P., Mallik, G., & Bagchi, T. P. (2018). Information communication technology (ICT) infrastructure and economic growth: A causality evinced by cross-country panel data. *IIMB Management Review*, 30(1), 91-103.
- Rachinger, M., Rauter, R., Müller, C., Vorraber, W., & Schirgi, E. (2019). Digitalization and its influence on business model innovation. *Journal of Manufacturing Technology Management*, 30, 1143-1160. <https://doi.org/10.1108/JMTM-01-2018-0020>
- Reichstein, C., Härting, R. C., & Neumaier, P. (2018, June). Understanding the Potential Value of Digitization for Business—Quantitative Research Results of European Experts. In *KES International Symposium on Agent and Multi-Agent Systems: Technologies and Applications* (pp. 287-298). Springer, Cham https://doi.org/10.1007/978-3-319-92031-3_29
- Snedecor, G. W. and Cochran, W. G. (1980). *Statistical Methods*, 7th ed. Iowa State University Press, Ames.
- Toader, E., Firtescu, B. N., Roman, A., & Anton, S. G. (2018). Impact of information and communication technology infrastructure on economic growth: An empirical assessment for the EU countries. *Sustainability*, 10(10), 3750 <https://doi.org/10.3390/su10103750>
- Vicente, M. R., & López, A. J. (2011). Assessing the regional digital divide across the European Union-27. *Telecommunications Policy*, 35(3), 220-237. <https://doi.org/10.1016/j.telpol.2010.12.013>
- Vicente, M.R., & López, A.J. (2006). Patterns of ICT diffusion across the European Union. *Economics Letters*, 93(1), 45–51. <https://doi.org/10.1016/j.econlet.2006.03.039>
- Vironen, H., & Kah, S. (2019). Meeting the challenges of digitalisation: implications for regional and rural development. EU European Policies Research Centre, University of Strathclyde, Glasgow. ISBN: 978-1-909522-50-3 <https://www.eprc-strath.eu/Publications.html?page=2> (2019. 12. 04)

Vossen, G., Schönthaler, F., & Dillon, S. (2017). Digitization and disruptive innovation. In *The Web at Graduation and Beyond* (pp. 223-247). Springer, Cham

Yousefi, A. (2011). The impact of information and communication technology on economic growth: evidence from developed and developing countries. *Economics of Innovation and New Technology*, 20(6), 581–596, [10.1080/10438599.2010.544470](https://doi.org/10.1080/10438599.2010.544470)

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**FOREIGN DIRECT INVESTMENT AS A FACTOR OF TRADE DEVELOPMENT:
CASES OF SELECTED COUNTRIES***

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Abstract. The purpose of the article is to identify the specifics and common features of the foreign direct investment (FDI) impact on foreign trade development in the Visegrad Group countries (the Czech Republic, the Republic of Hungary, the Republic of Poland and the Slovak Republic), to determine trade-related effects of FDI in the economies and the factors that caused them, as well as to highlight key points of the policy of FDI-led export expansion. The methodological basis of the study is presented by the theories of FDI and capital transnationalization that affect the FDI and international trade nexus, as well as the global value chains (GVCs) theories. The information base for the study was the UNCTAD data on FDI stock, FDI flows, merchandise and services exports and imports of the Visegrad countries for the period 1995–2017, as well as the databases of WTO, Eurostat and Central statistical offices of the Visegrad countries. The paper adds to the understanding the FDI and foreign trade nexus in a recipient country. The quantitative and qualitative trade-related effects of FDI attracted into the Visegrad Group countries are determined and calculated, the factors caused them are revealed. Econometric assessments of the relationship between FDI and export-import operations in the studied economies are carried out, tools for forecasting the export effects of FDI are developed. Key points of the policy of FDI-led export expansion are highlighted.

Keywords: foreign direct investment; foreign trade; multinational enterprise; global value chains; Visegrad Group.

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1. Introduction

Nowadays FDI is an important factor in foreign trade development in many countries of the world. According to UNCTAD, already at the edge of the XX–XXI centuries, China, Taiwan, Mexico, Republic of Korea, Costa Rica, Singapore, Thailand have succeeded in developing their export due to FDI. However, empirical studies do not lead to a conclusion about the uniquely positive impact of FDI on the host economies, including on their foreign trade. In this regard, it seems relevant to investigate the practical aspects of FDI trade-related effects formation, FDI impact on foreign trade dynamics and structure, export potential development in recipient countries.

In the article, the Visegrad Group countries (the Czech Republic, the Republic of Hungary, the Republic of Poland and the Slovak Republic) are selected to study the world experience of using FDI for foreign trade development. This choice is predetermined by two facts:

1) The Visegrad Group countries are a vivid example of the decisive role of multinational enterprises (MNEs) in expanding and changing the structure of a host country's foreign trade. So, UNCTAD research (UNCTAD, 2012) shows that according to the FDI Contribution Index among all countries of the world the largest contribution of FDI to the recipient economy development was registered in Hungary, followed by Belgium and Czechia. At the same time, all countries of the region represented in the ranking (the Czech Republic, the Republic of Hungary, the Republic of Poland) are leaders in the world by the FDI contribution to export development.

2) The experience of the Visegrad Group countries in using FDI for foreign trade development, can be adapted in developing economies and economies in transition, especially at the initial stages of the economic system transformation, when developing economic policies, especially investment, trade and industrial ones.

The methodological basis of the study is presented by the theories of FDI and capital transnationalization that affect the FDI and international trade nexus, as well as the global value chains (GVCs) theories. Some aspects of the relationship between FDI and international trade were studied in various concepts of FDI and transnational corporations, in the papers of such scientists as J. H. Dunning (Dunning 1981, 2001), S. Hirsch (Hirsch, 1976), K. Kojima, T. Ozawa, (Kojima & Ozawa, 1984), J.R. Markusen (Markusen, 2000, 2002), T. Ozawa (Ozawa, 1992), A.M. Rugman (Rugman, 1986), R. Vernon (Vernon, 1966), as well as in the papers of theorists of network economy and GVCs G. Gereffi (Gereffi, 2005), P. Gibbon (Gibbon, 2001), J. Humphrey, H. Schmitz (Humphrey, Schmitz, 2000), J.C. Jarillo (Jarillo, 1988), R. Kaplinsky (Kaplinsky, 2004), W. Powell (1991), H.B. Thorelli (Thorelli, 1986), etc.

The information base for the study was the UNCTAD data on FDI stock, FDI flows, merchandise and services exports and imports of the Visegrad countries for the period 1995–2017, as well as the databases of WTO, Eurostat and Central statistical offices of the Visegrad countries.

2. Literature Review

The most important issue and the main point of disagreement among scientists studying FDI-Trade nexus is the question of whether FDI and international trade represent complementary or alternative processes.

The internalization theory, formulated by P. Buckley, M. Casson (Buckley, Casson, 1976) and A. Rugman (Rugman, 1986), raises the issue of the FDI and international trade nexus. This concept was based on investigations of R. Coase (Coase, 1937) and E. Penrose (Penrose, 1956), and supposed that the most important motive for production transnationalization were the intention for internalization and advantages of internal operations over open market transactions.

The product life cycle theory (PLC theory), developed by R. Vernon (Vernon, 1966), clarifies the reasons of transition from export to production abroad. It is shown that FDI extends the product life. At the stages of standardization and maturity, in order to successfully compete in the market, a company has to find ways to reduce production costs, which can be done via FDI.

R. Aliber in the currency-premium theory developed monetary and financial aspects of TNCs functioning and concluded that corporations of countries with a strong currency, when choosing the way of their advantages realizing in a country with a weak currency, would prefer FDI. R. Aliber stated that host countries with weaker currencies had a high potential to attract FDI owing to differences in the market capitalization rates (Aliber, 1970).

S. Hirsch asserted that FDI could be analyzed within the framework of the industrial organization models and the location theory (Hirsch, 1976). He deduced criteria for choosing between two internationalization strategies (FDI and exports) based on minimizing total costs.

J. H. Dunning in the eclectic theory of international production (OLI model) integrated the elements of the internalization theory, ownership advantage theory and FDI location theory. So, firms choose FDI (not exports) when three preconditions coincide: the company has ownership, location and internalization advantages simultaneously (Dunning, 2001).

K. Akamatsu investigated the phenomenon of industrial development in emerging economies (Akamatsu, 1962). He substantiated the three-phase development of industries in the flying geese paradigm (FGP). According to this model, in the first phase of the industry development the demand for goods is mainly satisfied by imports, in the second stage imports are reduced as import-substituting production is developing and in the third stage industry becomes exporting. T. Ozawa added an investment aspect to this paradigm and showed that FDI helped to reduce significantly the second phase of development (Ozawa, 1992).

One of the main models that links FDI and international trade is the macroeconomic model of K. Kojima, in which FDI is divided into pro-trade and anti-trade (Kojima, Ozawa, 1984). The distinctive feature of the FDI, stimulating international trade, is its realization for production of undifferentiated, low-tech products. At the same time anti-trade FDI is carried out in high-tech industries, in which investing countries have a comparative advantage, in order to capture foreign markets, which in the result leads to exports substitution and balance of payments problems in the home country.

B. Blonigen created the model of export and foreign production nexus, according to which TNCs via FDI transfer a part of their value chain to the recipient country. So, the international production promotes intra-company trade in semi-finished products between branches of TNCs located in different countries (Blonigen, 2001).

It should be noted that at the present stage of the economic thought development, the integration of GVCs theories into the theories of international trade is taking place. So, to define a new type of trade in GVCs, G. Grossman and E. Rossi-Hansberg proposed the “trade in tasks” concept instead of the “trade in goods” concept (Grossman and Rossi-Hansberg, 2008). R. Baldwin and A. S. Blinder also concluded that the trade in finished goods was largely replaced by trade in intermediate goods and services, which was also associated with GVCs development (Baldwin, Robert-Nicoud, 2014). Later R. Baldwin and F. Robert-Nicoud introduced a simple but flexible analytical framework in which both trade in goods and trade in tasks arised (Baldwin and Robert-Nicoud, 2014).

As for the literature on the Visegrad countries, there is extensive literature on FDI in the region. For example, investigations of such scientists as L. Darmo, M. Novák and J. Lisý (Darmo et al. 2020), B. Ramasamy and M. Yeung (Ramasamy, Yeung 2020), T. Bieliński, M. Markiewicz, E. Oziewicz (Bieliński, 2019), P. Misztal (Misztal, 2020), N. Becker and A. Cie’slik (Becker, Cie’slik, 2020), M. Pečarić, T. Kusanović, P. Jakovac (Jakovac, 2021), T. Christoforidis and C. Katrakilidis (Christoforidis, Katrakilidis, 2021), P. Trąpczyński, M. Gorynia, J. Nowak and R. Wolniak (Trąpczyński et al., 2019), K. Josifidis, N. Supic and N. Doroskov (Josifidis et al., 2020), T. Dorożyński, B. Dobrowolska and A. Kuna-Marszałek (Dorożyński et al., 2020), M. Ganić and M. Hrnjic (Ganić, Hrnjic, 2019), M. Gorynia, J. Nowak, P. Trąpczyński, R. Wolniak (Gorynia et al., 2019), Ş.C. Gherghina, L.N. Simionescu, Oana S. Hudea (Gherghina et al., 2019), M. Ganić, M. Hrnjić (Ganić, 2021), B. Setiawan, A. Saleem, R. Jeyakumar Nathan, Z. Zeman, R. Magda and J. Barczy (Setiawan et al., 2021) and others.

At the same time the literature on the relationship between FDI and trade in these countries is not so numerous.

M. Weresa (Weresa, 2001) concluded that in Poland the main element of the FDI influence on trade is its contribution to export creation and restructuring. The changes in companies with foreign participation were of a different nature. They included a rise in foreign trade volume, profitability and changes in employment. The inflow of FDI did not substitute for Poland's trade with the EU. On the contrary, it created trade flows, as foreign investment was made mainly in sectors where Poland already had a comparative advantage in trade.

L. Kosekahyaoglu (Kosekahyaoglu, 2006) explored the relationship between FDI and trade flows for Turkey, the Czech Republic, Hungary and Poland. He concluded that the relationship between FDI and foreign trade in Poland is quite different than that of the Czech Republic and Hungary. The results suggested a bi-directional Granger causality relationship between FDI and foreign trade in the Czech Republic and Hungary, however, a unidirectional Granger causality between FDI and exports running from exports to FDI in Poland.

M. Sass, Z. Gál and B. Juhász (Sass, et al. 2018) analysed the impact of FDI on the host economies of the Visegrad countries in four selected service industries in two areas: export and employment. They concluded that FDI in the four selected service industries differ in terms of their vertical or horizontal nature: in business services FDI is predominantly vertical; in financial services and telecommunications it is predominantly horizontal; while in computer-related service activities both types can be found. The impact on the host economy differs in the four service industries. The authors found a positive and significant impact on exports in vertical business services and in horizontal telecommunications services. The positive impact either diminished or disappeared during the global recession of 2008–2009. The comparison of the four Visegrad countries demonstrates the heterogeneous intensity and significance of this impact, indicating their different specialisations in the analysed services industries.

C.T. Albulescu and D. Goyeau (Albulescu, Goyeau, 2019) assessed the CEE countries' intra-integration, focusing on the Czech Republic, Hungary, Poland and the Slovak Republic, and documented a complementarity effect between trade and FDI in these countries, which was stronger for historical trade partners.

A. Cieřlik (Cieřlik, 2009) studied empirically the relationship between the volume of trade and FDI in Poland. The author found that FDI contributes positively to the development of international trade between Poland and OECD countries, while the vertical model of the multinational firm may not be appropriate for explaining trade and FDI patterns between Poland and the OECD countries. Potential explanations can be such that even horizontal FDI may be trade creating if imported intermediate goods are used in the production process or alternatively FDI may be done with the aim of facilitating imports into the host country.

A. Cieřlik and J. Hagemejer (Cieřlik, Hagemejer, 2014) analysed export spillovers of multinational enterprises in Poland. The empirical results supported the existence of positive spillovers related to MNE export activity at the sectoral level but not at the regional level. Authors concluded also that the individual absorptive capacity determined the size of export spillovers.

A. Cieřlik, A. Michalek, J.J. Michalek, J. Mycielski (Cieřlik, et al. 2015) investigated the determinants of firms' export performance in three Baltic states and four Central European countries (the Czech Republic, Hungary, Poland and Slovakia). The results obtained for the Baltic and Visegrad countries indicated that the probability of exporting is positively related to the level of productivity, firm size, the share of university graduates in productive employment and the internationalization of firms.

A. Cieřlik, J. Michałek, K. Szczygielski (Cieřlik et al., 2019) used the negative binomial model to examine empirically the main reasons for multinational activity of firms originating from the new EU member states in Poland during the period 1990–2014. The estimated specification of the empirical model was based on the modified knowledge-capital model with two types of capital in which both horizontally- and vertically-integrated firms could coexist in equilibrium. The assembled empirical evidence pointed to both market access and efficiency seeking as the main reasons for undertaking foreign direct investment in Poland by multinational

enterprises based in the new EU-12 member states. However, cultural proximity does not seem to be an important factor in explaining the extent of multinational activity in Poland.

A. Cieřlik (Cieřlik, 2020) pointed to the vertical motive as the primary reason for undertaking FDI in Poland in 1996-2015 by multinational firms based in the OECD member states. However, when the model was re-estimated for the pre-accession period only, both efficiency seeking and market seeking motives were important. Finally, the estimation results obtained for the post-accession years only revealed that the pure vertical model was preferred to both the pure horizontal model and the knowledge capital model. Moreover, it was found that the importance of the vertical reason for inward FDI in Poland has increased over time. This suggests the changing pattern of inward FDI in Poland due to its increased involvement into the GVCs organized by the MNEs from the source countries.

However, the scientific literature does not provide a comprehensive study of FDI and foreign trade nexus in some regions of the world, including in the Visegrad countries' economies. It has predetermined the purpose of the article that is to identify the specifics and common features of FDI and foreign trade nexus in the Visegrad Group countries, to determine FDI trade-related effects in the economies and the factors that caused them, as well as to highlight key points of the policy of FDI-led export expansion.

3. Research results

First of all, it seems appropriate to investigate the dynamics of FDI inflows into the economies of the Visegrad countries that to a certain extent characterizes the countries' potential in the development of foreign trade due to FDI inflows.

Since the early 1990s FDI inflows into the region have been characterized by high dynamics. At present the Visegrad countries account for more than 70% of all FDI accumulated in Central and Eastern Europe². As a result, Czechia, Slovakia and Hungary surpassed most of the European Union (EU) countries in terms of FDI stock relative to GDP (the average level in the EU is 46.7%, in the world – 35%) (table 1) (UNCTAD, 2017).

Table 1. FDI stock in the Visegrad Group countries (end of the year)

Country	FDI stock, billion US dollars					FDI stock to GDP, %				
	1995	2000	2011	2017	2018	1995	2000	2011	2017	2018
Republic of Hungary	11,3	23	84	90.6	88.7	24.3	48.3	60.6	64.8	57.0
Czech Republic	7,4	22	125	156	155.0	12.3	35.1	52.9	72.3	64.1
Republic of Poland	7,8	34	198	238.5	231.8	5.5	19.5	31.1	45.3	39.6
Slovak Republic	1,3	5	51	55.8	57.1	6.5	33.7	52.9	58.4	53.6

Source: authoring based on UNCTAD data (UNCTAD, n. d.)

Poland is the leader in FDI stock in the region. At the beginning of 2019, its share amounted to 47.8%³ of all FDI accumulated in the Visegrad Group countries. Traditionally, investors were attracted in the country by a large and growing market, in which in the early 90s demand exceeded supply. Czechia ranks the first in the region in terms of the FDI stock to GDP (64.1 %, compared to 39.6 % in Poland). Hungary became the first country in the region to create favorable conditions for production cooperation with foreign investors, and FDI plays a significant role in its economy. So, at the beginning of 2019, in Hungary, the ratio of FDI stock to GDP was equal to 57.0 %. Slovakia began to import actively FDI only in the early 2000s. As a result, at the beginning of 2019, its share in

² Calculated by authors on the basis of UNCTAD data (UNCTAD, n. d.).

³ Calculated by authors on the basis of UNCTAD data (UNCTAD, n. d.).

the total FDI stock in the region amounted to only 10.6⁴. The study showed that, despite a large number of registered enterprises with foreign capital in the Visegrad countries, the most of FDI was made by MNEs, whose regional strategy is often associated with plans to rationalize production on a European scale. The MNEs contributed to the formation of industrial clusters in the region, primarily of automotive one.

As a result, an important positive FDI effect in the economies was their rapid integration into the GVCs of MNEs. Intra-industry production cooperation developed in such areas as the automotive industry, the production of communications equipment and office electronics, furniture. The GVC participation index in the Visegrad countries exceeds both the average level of developing countries (48.6) and developed ones (48). According to the WTO–UNCTAD (WTO, n. d.), the highest degree of integration in international production is observed in Slovakia, where the GVC participation index is equal to 67.3%, the lowest – in Poland (55.5%) (WTO, n. d.).

So, it was the integration of the Visegrad countries' economies into GVCs (based on FDI inflows) that had a great influence on the development of their foreign trade, especially of their export. Due to the high level of international competitiveness, access to foreign distribution networks, MNEs took dominant positions in foreign trade of the region. For example, at the end of 2016, in Poland the share of enterprises with foreign capital accounted for 43.6% of merchandise and services exports and for 56.6% of imports⁵.

As a result, in the region the foreign trade turnover and the degree of participation in international labor division increased significantly (in 2017, the foreign trade turnover of Hungary was equal to 235 billion US dollars, Poland – 551, Slovakia – 178.8, Czechia – 327.5) (UNCTAD, n. d.), as well as the foreign trade balance of the studied economies improved (figure 1).

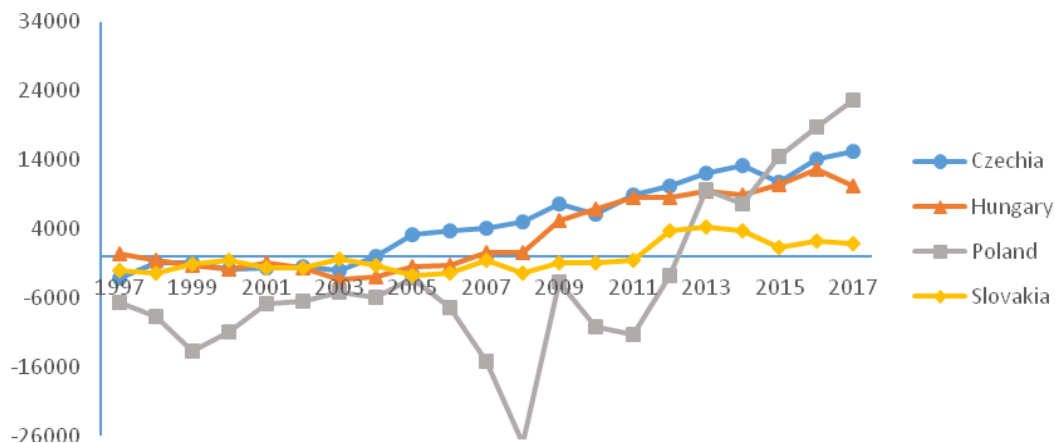


Figure 1. Foreign trade balance of the Visegrad countries (total trade in goods and services), million USD

Source: authoring based on UNCTAD data

To assess the degree and the nature of the FDI impact on the foreign trade development in the Visegrad countries, as well as to identify the quantitative trade-related effects of FDI, the FDI and foreign trade nexus in these countries was evaluated using econometric methods. It aimed to determining the form and the nature (alternative or complementary) of interrelation between the studied indicators.

The information base for the study was the UNCTAD data on FDI stock (X) and merchandise and services exports and imports (Y) of the Visegrad countries in 1995–2017. The choice of the FDI stock indicator for the

⁴ Calculated by authors on the basis of UNCTAD data (UNCTAD, n. d.).

⁵ Calculated by authors on the basis of Eurostat data.

FDI evaluating is predetermined by the fact that in the result of theoretical and empirical analysis it was justified that FDI trade-related effects in a recipient country were dependent on the FDI stock in it (Shalupayeva, 2019).

The following scientific hypotheses were formulated.

Hypothesis 1. FDI stock is one of the major factors in export development in the Visegrad Group countries.

Hypothesis 2. FDI accumulation contributes to balancing the foreign trade of the Visegrad Group countries.

To confirm/disprove the hypotheses, paired econometric dependencies of exports and imports (Y_t) on FDI stock (X_t) for each of the countries have been analyzed (for details see (Kamornikov, Shalupayeva, 2019). The calculation was carried out using a data analysis package in MS Excel.

This analysis made it possible to substantiate a number of conclusions.

1) There is a noticeable positive interrelation between FDI stock and merchandise exports volume in the economies of Czechia, Hungary and Poland (for example see figure 2).

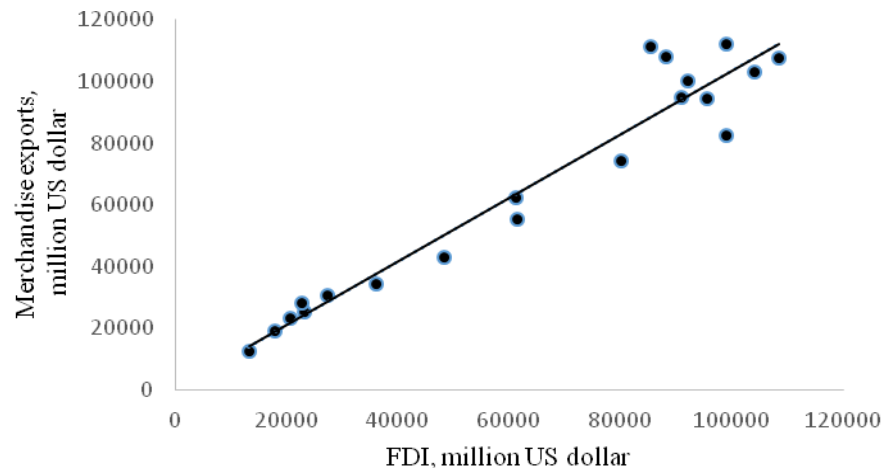


Figure 2. Correlation field of the dependence of merchandise exports on FDI stock in Hungary

Source: authoring based on UNCTAD data (UNCTAD, n. d.)

In the Slovak economy this interrelation is characterized as moderate (table 2).

2) FDI is a significant factor in the development of foreign trade in goods in all countries of the Visegrad Group. It determines the dynamics of Hungary's merchandise exports by 53%, Czechia, Poland and Slovakia – by 44, 43 and 24%, respectively (table 2).

3) The average elasticity coefficient of merchandise exports by FDI in all countries is less than 1. The smallest elasticity coefficient is observed in Czechia (0.928), the largest – in Hungary, where the change in FDI by 1% leads to an increase in merchandise exports by 0.991% (table 2).

Table 2. The results of the regression analysis of the FDI and merchandise exports interrelation in the Visegrad Group countries

Country	Correlation coefficient*, R	Determination coefficient*, R ²	Elasticity coefficient, E
Republic of Hungary	0,731	0,534	0,991
Czech Republic	0,663	0,440	0,928
Republic of Poland	0,655	0,429	0,949
Slovak Republic	0,492	0,242	0,966

* After removing trends in the model

Source: authoring based on UNCTAD data (UNCTAD, n. d.)

4) The quantitative export effects of FDI in all countries of the region exceed import effects. The largest export effect is observed in Slovakia (1,517 US dollars per 1 dollar of FDI), the smallest – in Poland (1,114 US dollars per 1 dollar of FDI) (table 3).

Table 3. Quantitative trade-related effects of FDI in the economies of the Visegrad Group countries, USD per 1dollar of FDI

Country	Export effects			Import effects		
	Goods	Services	Goods and services	Goods	Services	Goods and services
Republic of Hungary	1,062	0,206	1,268	0,947	0,167	1,114
Czech Republic	1,143	0,150	1,293	0,989	0,126	1,115
Republic of Poland	0,942	0,202	1,144	0,906	0,149	1,055
Slovak Republic	1,388	0,129	1,517	1,328	0,133	1,461

Source: authoring based on UNCTAD data (UNCTAD, n. d.)

Thus, the results of econometric assessments allowed to confirm:

- 1) the hypothesis that FDI stock is one of the major factors in export development in the Visegrad Group countries;
- 2) the hypothesis that FDI accumulation contributes to balancing the foreign trade of the considered economies.

The results of econometric assessments made it possible also to determine the tools for forecasting the foreign trade development in the Visegrad Group countries. In particular, for the Hungarian economy the following regression equation of merchandise exports (EXP) dependence on FDI was obtained:

$$\text{EXP} = 1,056 \text{ FDI} + 973.01 + \varepsilon \quad (1).$$

So, the research identified the following trade-related effects of FDI in the Visegrad Group countries.

1) Quantitative export effects of FDI.

FDI is one of the most important factor in the export development in most countries of the region (table 2). Adaptation of enterprises acquired by foreign investors to the requirements of the world market and especially the construction of new enterprises integrated into the GVCs of MNEs ensured the growth of merchandise exports in

the region. The quantitative export effects of FDI exceed import effects in all the Visegrad Group countries and it contributes to balancing their foreign trade (table 3).

Hungary has achieved significant success in developing its exports due to FDI inflows. So, at the end of 2016, in Hungary, the exports of the companies with foreign capital amounted to 72% of the total Hungarian exports (for comparison in Poland– 57.5% ⁶) (table 4).

Table 4. Trade indicators of the foreign-owned enterprises in Hungary, 2013–2016, billion HUF

Indicators	2013	2014	2015	2016
Exports	18 465,0	18 786,4	23 621,9	24 646,0
Imports	16 139,3	18 068,4	20 460,1	20 943,1
Foreign trade balance	2 325,7	718,0	3 161,8	3 702,9

Source: authoring based on the Hungarian Central Statistical Office data.

Moreover, in Hungary, this group of enterprises is characterized by a positive balance of foreign trade, which in the 1990s – early 2000s contributed to maintaining a relatively low trade deficit, and later - to formation of a positive foreign trade balance. For example, according to UNCTAD, in 1998, Hungary's trade balance deficit was only 0.554 billion US dollars, compared with 8.6 billion in Poland.

In Poland, FDI inflows also create a significant impetus for export increasing. In 1995, exports of the companies with foreign capital amounted to 30% of the total country's exports, by the end of 2016 – already 57.5%⁷ (table 5).

Table 5. Indicators of foreign trade in goods and services of the foreign-owned enterprises in Poland, 2007–2016, billion PLN

Indicators	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Exports	245,3	251,0	259,1	293,0	338,7	358,6	375,6	398,5	429,1	476,4
Imports	264,8	279,0	301,4	324,2	370,3	377,2	379,3	398,7	419,3	444,7
Foreign trade balance	-19,5	-28	-42,3	-31,2	-31,6	-18,6	-3,7	-0,2	9,8	31,7

Source: authoring based on the Central Statistical Office of Poland data.

As a result, in the last decade in Poland, active exports growth of the enterprises with foreign capital has led to reduction in their negative trade balance, which since 2015 has gained positive values (table 5). So, according to the data of the Central Statistical Office of Poland, at the end of 2016, the foreign trade balance of companies with foreign capital amounted to 31.7 billion zlotys, while in 2009 it was equal to -42.3 billion zlotys (table 5). It should be noted that intra-group exports in 2016 amounted to 32.6% of total exports of enterprises with foreign capital functioning in Poland (Central Statistical Office of Poland, 2017).

So, the comparison of the exports growth rate of companies with foreign capital in Poland with their imports growth rate shows the country's increasing ability to attract export-oriented FDI.

2) Quality export effects of FDI.

a) *Changes in the export geographical structure.* After joining the EU, the active integration policy in the investment sphere led to a deep trade integration of the Visegrad countries with Western European countries. MNEs contributed a lot to the reorientation of their trade to the EU countries. For example, in 2016, trade with the EU accounted for 79.8% of Polish exports (Central Statistical Office of Poland, 2018). Moreover, the

⁶ Calculated by authors on the basis of the Hungarian Central Statistical Office data, the Statistics Poland data.

⁷ Calculated by authors on the basis of the Statistics Poland data.

concentration of Polish exports on EU countries tends to increase. So, in 2012, this indicator was equal to 76.1% (Central Statistical Office of Poland, 2018). These processes made the Visegrad Group economies highly dependent on the EU economies.

b) *Changes in the export commodity structure.* The research showed that due to FDI inflows, there was a significant improvement in the export commodity structure of the Visegrad countries, primarily due to the increase in the share of high value-added goods (components and parts for electronic equipment, computers, cars, etc.). Already in 1999, the share of these goods in Hungary's exports to the EU accounted for 63%, in Czechia – 47 %, and in Poland – 32 %. In consumer goods exports to the EU market the share of new products with improved consumer properties that meet the EU standards and requirements has increased.

In general, there was a significant increase in the share of medium-high-technology and high- technology industries in the considered countries' exports.

The contribution of MNEs to the development of high-tech products exports in the countries of the region is explained not only by an initially higher level of technological development of foreign companies, but also by more intensive research and development in them. So, according to Eurostat, in the Visegrad Group countries the share of domestic R&D expenditures at enterprises with foreign capital in their total volume in the country ranges from 45 % in Poland to 78 % in the Slovak Republic.

In the Slovak Republic, despite relatively small volumes of FDI stock, it can be noted a high concentration of foreign capital in the high-tech sector of the economy. So, in the high-tech manufacturing sector, companies with foreign capital provide about 95 % of gross revenue, in the services sector – almost 60 %⁸.

c) *Increasing monopolization of exports.* So, the calculations show that in Hungary the export of enterprises with foreign capital is concentrated, unlike imports, mainly in the sector of large companies, and the monopolization of exports by large MNEs is only increasing (table 6).

Table 6. Indicators of the concentration of merchandise foreign trade in Hungary, %

	2013	2014	2015	2016
Exports:				
– 5 companies	16,3	21,2	28,1	29,1
– 10 companies	27,2	29,5	35,4	36,9
Imports:				
– 5 companies	10,5	6,5	7,8	8,3
– 10 companies	16,2	12,5	13,2	14,1

Source: authoring based on the Hungarian Central Statistical Office data (Hungarian Central Statistical Office, 2017a)

So, according to the Central Statistical Office of Hungary (Hungarian Central Statistical Office, 2017b), in 2016, 8,737 companies with foreign capital carried out foreign trade operations, and 7,860 of them were importers and only 5,507 were exporters (while, as noted above, a group of enterprises with foreign capital was characterized by a positive foreign trade balance this year). As a result, in Hungary, a significantly higher level of concentration of merchandise exports, compared with imports, is observed. So, in 2016, quite 30 % of Hungarian exports were realized by only five companies (compared with 8 % of imports)⁹.

3) *Quantitative import effects of FDI.*

The intensive FDI inflows were also one of the major reasons for dynamic imports development in the Visegrad Group countries (table 3). For example, in Poland, companies with foreign capital are not only the largest exporters, but also are the largest importers. So, at the end of 2016, their imports amounted to 444.7 billion zlotys

⁸ Calculated by authors on the basis of the Statistical Office of the Republic of Slovakia data.

⁹ Calculated by authors on the basis of the Hungarian Central Statistical Office data.

(which was 6.1% higher than in 2015), or 56.6 %¹⁰ of the country's total imports (table 5). At the same time, 24.1% of total imports accounted for intra-group imports (25.2% a year earlier) (Central Statistical Office of Poland, 2017).

Poland has traditionally been distinguished by the inflows of FDI oriented on a large domestic market. As a result, the FDI inflows caused the growth of the passive trade balance of the country. So, in 2016, import operations in the country were carried out by 11,938 companies with foreign capital (48.2% of all companies functioning in the country), export – by 11,239 enterprises (45.4%). At the same time, 40.8% of imports of enterprises with foreign capital represented the imports of final goods for resale (Central Statistical Office of Poland, 2017).

It should be noted that small and medium companies with foreign capital, compared to large ones, are more oriented on the domestic market. So, in 2016, in the group of enterprises with the number of employees up to 50 people, 8,330 enterprises carried out import operations and only 7,657 – export ones. In the group of large enterprises with 250 employees and more, this gap is significantly smaller – 1,255 and 1,233 enterprises respectively (Central Statistical Office of Poland, 2017).

4) *Quality import effects of FDI.*

a) *Changes in the import geographical structure.* The FDI inflows of MNEs contributed to the increase in import concentration on the EU countries. So, in 2016, the trade with the EU accounted for 61.2 % of Polish imports (Central Statistical Office of Poland, 2018). Moreover, the concentration of Polish imports on the EU countries tends to increase. So, in 2012, this indicator was equal to 57.5 % (Central Statistical Office of Poland, 2018).

b) *Changes in the import commodity structure.* Due to the trade operations of MNEs the share of capital-intensive and high-tech products in the Visegrad Group countries imports increased while the share of fuel and raw materials decreased. Already in 1999, the share of equipment and vehicles in Hungarian imports amounted to 50 %, in Poland and Slovakia – to 38 %, in Czechia – to 40 %. The inflows of market-oriented FDI also stimulated the growth of high-quality consumer goods imports, primarily in Poland.

At the same time, the research revealed also a number of negative trade-related effects of FDI in the economies of the Visegrad Group countries:

- foreign trade activities of companies with foreign capital (which as a rule use imported materials, equipment and components more actively than domestic firms) negatively affected the balance of payments of the Visegrad Group countries in the case of FDI oriented to the domestic market (example of Poland);
- expansion of the export-oriented foreign sector made the economies of the region highly dependent on the external economic environment;
- reorientation of foreign trade to one main geographical direction (EU market) while losing positions in the markets of traditional partners, which made the economies of the Visegrad Group countries highly dependent on the European countries' economies (for example, in 2016, trade with the EU amounted to 79.8% of Polish exports and 61.2% of imports);
- closure or reorganization for assemblies or simple components production of a number of enterprises purchased during the privatization process (examples of Polish companies Zamech, Dolmel, etc.);
- FDI concentration at 100% foreign-owned enterprises, poorly integrated into the national economy, which is due to the EU legislation that did not allow a selective approach to FDI (for example, in the Czech motor vehicle industry the Czech-owned companies are totally absent from the first tier suppliers and are only linked

¹⁰ Calculated by authors on the basis of the Statistics Poland data (Central Statistical Office of Poland, 2017; Central Statistical Office of Poland, 2018).

by casual technological relationships to foreign-owned multinational subsidiaries which has limited vertical spillovers of foreign-owned multinational subsidiaries on the indigenous industry) (Rugraff, 2010);

- growth of the national currencies real value (caused by FDI inflows and a decrease in economic risks for foreign investors), which in turn negatively affected the considered countries' exports;
- crowding out of domestic producers from entire segments of the economies, as a result economic growth in the region became highly dependent on the activities of the leading MNEs;
- relatively narrow production specialization of these countries, formed in accordance with the interests of MNEs, which made their economies more vulnerable during crisis.

As a result of the research, the factors that caused the mentioned trade-related effects of FDI in the Visegrad countries are revealed and divided into three groups.

1) *Factors related to the motivation and strategies of MNEs.* The main types of FDI attracted to the Visegrad countries are export-platform and complex FDI, which predetermined the significant role of MNEs in the export development of the studied economies. However, there are also inflows of market-oriented FDI in the region, aimed at satisfying domestic demand of the recipient countries, which are mainly characteristic of Poland. It may explain the fact that FDI in Poland caused the least export effects among all the countries of the region (table 3).

2) *Factors related to the characteristics and economic potential of the host countries,* including the countries' geographical position; unsaturated growing domestic markets; significant intellectual capital and research potential; relatively low cost of resources; agglomeration effect.

3) *Factors related to economic policy of the host countries,* including privatization processes; economic reforms that improved the investment climate; liberalization of investment and trade regimes; FDI incentive policies; creation of special economic zones; development of communication and financial infrastructure; involvement in the process of European integration and unification of national legislation with the European one.

The study of the Visegrad countries' experience highlighted key points of the policy of FDI-led export expansion.

1) *Regional economic integration as a way to attract export-oriented FDI.* Obviously, the joining the EU and the harmonization of national legislation with the European one, firstly, reduced investment risks in the Visegrad Group countries for foreign investors, and secondly, provided investors with additional benefits in the form of free trade in goods and services, free capital and labor movement within the intraregional market. The elimination of trade barriers with European countries has attracted the investment of East and Southeast Asia, Japan, seeking to expand exports to the EU market. The EU membership facilitated also the participation in GVCs, especially for the smaller firms in the CEE countries (Cieřlik, Michałek and Szczygielski, 2019). As a result, the joining the EU increased the investment attractiveness of the countries of the region, which led to new export-oriented, in particular export-platform, FDI inflows and to profits reinvestment in these countries.

2) *Integration into GVCs as an effective way to develop export due to FDI inflows.* The integration of national producers in GVCs of transnational corporations was one of the main factors of exports development in the Visegrad group countries. Due to a high level of competitiveness and access to a foreign distribution network, branches of MNEs took dominant positions in the foreign trade of the countries. As a result, their foreign trade balance improved significantly.

3) *Coherency of investment, trade and industrial policies.* The success of the Visegrad Group countries in FDI attraction can be largely explained by the fact that their FDI policy, firstly, was a part of industrial policy and economic development policy as a whole, and secondly, was directed to achieving strategic goals, including foreign trade development. The methods and instruments of investment and trade policies used in these countries were well coordinated. For example, in the Czech Republic since 1998, investment incentives were dependent on the results of enterprises' economic activity. For example, one of the requirements was that investments should be

made in the manufacturing sector, and at least 50% of the investment should be directed to the purchase of high-tech equipment. In addition, government grants were provided for creation of new jobs (from 2,000 to 6,000 US dollars per person) and for training of employees (up to 35% of expenses).

4) *Focus on large investment projects and targeted approach to strategic investors*, which was especially evident in Hungary. Thus, most of the investment incentives in Hungary were provided by the tax system. For example, the full exemption from income tax for 10 years was provided for foreign companies if the investment was at least 33 million US dollars and at least 500 workers were employed. In Hungary, to attract large transnational corporations, free customs zones were also created in which the largest MNEs established their subsidiaries for assembling manufactured goods primarily for export. After joining the EU, Hungary had to abandon the practice of using these free customs zones as a tool for FDI attracting, but after 2004, for these purposes industrial parks harmonized with EU standards began functioning in the country.

5) *Retention of the investment promotion system in new forms even after joining the EU*, which has become possible due to the transformation of investment incentives. So, preferences began to be actively included into the employment policy, as well as the regional development and R&D policies. For example, after joining the EU, in Hungarian export zones, they had to abandon differentiated tariffs for exported goods depending on the value added amount. Tariff protectionism, provided by the Czech Republic to Volkswagen group in exchange for large investment in Skoda, has also become impossible in EU. Nevertheless, the system of investment incentives in the Visegrad group countries has been preserved. For example, in Hungary, in order to stimulate research and development, the tax base might be reduced by the full amount of expenses on it.

6) *Trade liberalization, primarily in the industries that are priority for the GVCs development*. As the study showed, the trade liberalization is a key element in the strategy of attracting export-oriented FDI of MNEs in the context of GVCs development. In the Visegrad Group countries, trade liberalization has also become one of the main factors in increasing the attractiveness of their economies for FDI.

7) *Active policy of increasing the potential of small and medium-sized enterprises as GVC participants*, including by stimulating vertical economic relations between MNEs and local suppliers. So, in the Visegrad group countries different programs, grants and other financial instruments were used to support the investment of small and medium-sized enterprises, to develop relations between domestic suppliers and large foreign companies and MNEs. In Hungary, financial instruments have been used for delivering investments for Structural Funds since the 1994–1999 programming period (Nyikos, Soós, 2018). Their relative importance has increased during the programming period 2007–2013 and 2014–2020 as well.

8) *Combination of human capital development policy with the development of legislation in the field of intellectual property rights protection* in order to stimulate FDI inflows to the high-tech sector of the economy. In the Visegrad Group countries, relatively inexpensive and skilled workforce, along with increasing labor productivity, became an important factor stimulating the FDI inflows and the R&D in the high-tech sector, that were further stimulated by harmonization of the countries' systems of intellectual property rights protection with the EU legislation.

Conclusions

It was justified that the integration of the Visegrad Group economies into the GVCs of MNEs, realized via FDI inflows, was the major factor in their foreign trade development, primarily, in the increase in their export potential and the transformation of their international specialization. It is the FDI of MNEs that became one of the main factors that ensured the creation of export-oriented and competitive companies in the automotive, electronic, chemical, food, tobacco industries in the considered countries. A special feature of the Visegrad Group countries is that their deep integration into the GVCs is realized mainly by imports of parts and components rather than raw

materials, which ensures their participation in the final stages of international production process, rise of the value added created and development of high-tech exports.

Based on the results of econometric assessments, the hypothesis that there is a positive connection between FDI and merchandise exports in all Visegrad Group countries was confirmed. It is proved that FDI is an important factor in export development in all considered economies, determining the change in the volumes of Hungarian merchandise exports by 53%, Czech, Polish and Slovak – by 44, 43 and 24% respectively. The quantitative trade-related effects of FDI in the Visegrad Group economies are calculated. It's justified that the quantitative export effects of FDI in all countries of the region are superior to import effects. The largest export effects per 1 US dollar of FDI are observed in Slovakia, the smallest – in Poland.

The trade-related effects of FDI revealed in the Visegrad Group countries are divided into quantitative (significant increase in commodity exports and an increase in imports) and qualitative (change in the export geographical structure due to the trade reorientation to EU countries and other developed countries; change in the export commodity structure, which is manifested in a radical decrease in the share of traditional labor-intensive products and an increase in the share of capital-intensive products; growth of the share and volumes of high-tech products exports, which was the result not only of an initially higher level of technological development of foreign companies, but also more intensive R&D in them; change in the import geographical structure due to an increase in its concentration in the EU countries; change in the import commodity structure, which is manifested in an increase of the share of capital-intensive and high-tech products and a reduce in the share of fuel and raw materials). Both positive and negative trade-related effects of FDI in the economies of the Visegrad Group countries are identified, but it is justified that the positive macroeconomic trade-related effects of FDI exceed the negative ones. And it is shown that FDI inflows to the economies of the region have largely positively influenced both quantitative and qualitative indicators of their participation in international trade and contributed to transformation of their specialization in international labor division.

It is shown by the example of the Visegrad Group countries that a recipient country's ability to use FDI as a tool for export development depends, on the one hand, on the motivation and strategies of MNEs and, on the other hand, on the economic potential and policies of the host country. In general, an active policy of FDI attracting, an individual approach to investors, development of dynamic competitive advantages, as well as the economic integration with developed EU countries ensured a significant optimization of the process of integrating of the Visegrad Group countries into international production.

The study made it possible to highlight a number of key points of the policy of FDI-led export expansion, among them: regional economic integration as a way to attract export-oriented FDI; integration into GVCs as an effective way to develop export due to FDI inflows; focus on large investment projects, targeted approach to strategic investors; the investment promotion system based on the coherency of investment, trade and industrial policies; trade liberalization, primarily in the industries that are priority for the GVCs integration; active policy of increasing the potential of small and medium-sized enterprises as GVC participants; combination of human capital development policy with the development of legislation in the field of intellectual property rights protection.

References

- Akamatsu, K. (1962). A Historical Pattern of Economic Growth in Developing Countries. *Journal of Developing Economies*, Vol. 1, No 1, 3-25. <http://doi.org/10.1111/j.1746-1049.1962.tb01020.x>
- Albulescu, C.T. and Goyeau, D. (2019). The interaction between trade and FDI: The CEECs experience. *International Economics and Economic Policy*, Vol. 16, 489–509, available at: <https://doi.org/10.1007/s10368-019-00438-1> (accessed 26 May 2021).
- Aliber, R.Z. (1970). *A Theory of Direct Foreign Investment. The International Corporation*.
- Baldwin, R. and Robert-Nicoud, F. (2014). Trade-in-goods and Trade-in-tasks: An Integrating Framework. *Journal of International Economics*, Vol. 92, No. 1, 51–62.
- Becker, N., Cieřlik, A. (2020). Determinants of German Direct Investment in CEE Countries. *Journal of Risk and Financial Management*, Vol. 13, No 11, 268-285. <https://doi.org/10.3390/jrfm13110268>
- Bieliński, T., Markiewicz, M. and Oziewicz, E. (2019). Do Central and Eastern Europe Countries Play a Role in the Belt and Road Initiative? The Case of Chinese OFDI into the CEE–16 Countries. *Comparative Economic Research*, No 22, 7-22. <https://doi.org/10.2478/ceer-2019-0009>
- Blonigen, B. A. (2001). In Search of Substitution between Foreign Production and Exports. *Journal of International Economics*, Vol. 53, No. 1, 81–104.
- Buckley, P.J and Casson, M. (1976). *The Future of the Multinational Enterprise*. London: Macmillan.
- Central Statistical Office of Poland. (2017). *Economic Activity of Entities with Foreign Capital in 2016*, available at: <https://stat.gov.pl/en/topics/economic-activities-finances/activity-of-enterprises-activity-of-companies/economic-activity-of-entities-with-foreign-capital-in-2016,2,11.html> (accessed 26 June 2020).
- Central Statistical Office of Poland. (2018). *Yearbook of Foreign Trade Statistics of Poland 2017*, available at: <https://stat.gov.pl/en/topics/statistical-yearbooks/statistical-yearbooks/yearbook-of-foreign-trade-statistics-2017,9,11.html> (accessed 21 July 2020).
- Christoforidis, T., Katrakilidis, C. (2021). Does Foreign Direct Investment Matter for Environmental Degradation? Empirical Evidence from Central–Eastern European Countries. *Journal of the Knowledge Economy*. <https://doi.org/10.1007/s13132-021-00820-y>
- Cieřlik, A. (2009). Foreign direct investment and the volume of trade: the case of Poland. *Economic Change and Restructuring*, Vol. 42, 273–291. <https://doi.org/10.1007/s10644-009-9072-x> (accessed 26 May 2020).
- Cieslik, A. (2019). What attracts multinational enterprises from the new EU member states to Poland? *Eurasian Business Review*, No 10, 1-17. <https://doi.org/10.1007/s40821-019-00122-z>
- Cieřlik, A. (2020). Determinants of foreign direct investment from OECD countries in Poland. *Eurasian Economic Review*, Vol. 10, 9–25, available at: <https://doi.org/10.1007/s40822-019-00136-y> (accessed 26 May 2021).
- Cieslik, A. and Hagemejer, J. (2014). Multinational Enterprises, Absorptive Capacity and Export Spillovers: Evidence from Polish Firm's Level Data. *Review of Development Economics*, Vol. 18, Issue 4, 709-726, available at: <http://dx.doi.org/10.1111/rode.12113>
- Cieslik, A., Michalek, A., Michalek, J.J. and Mycielski, J. (2015). Determinants of Export Performance: Comparison of Central European and Baltic Firms, *Czech Journal of Economics and Finance (Finance a uver)*, Vol. 65, Issue 3, 211-229.
- Cieřlik, A., Michalek, J. and Szczygielski, K. (2019). What matters for firms' participation in Global Value Chains in Central and East European countries? *Equilibrium. Quarterly Journal of Economics and Economic Policy*, Vol. 14, Issue 3, 481–502. <https://doi.org/10.24136/eq.2019.023> (accessed 26 May 2020).
- Ciobanu, R., Șova, R., & Popa, A.F. (2020). The Impact of FDI over Economic Growth and how COVID-19 Crisis Can Impact the CEE Economies. *CECCAR Business Review*, No 4, 64-72. <http://dx.doi.org/10.37945/cbr.2020.04.08>
- Coase, R. H. (1937). The nature of the firm. *Economica*, Vol. 4, No 16, pp. 386–405.
- Darmo, L., Novák, M. and Lisý, J. (2020). Relationship between Foreign Direct Investment Inflow and Unemployment in the Slovak Republic. *Politická ekonomie*, Vol. 68, No 4, 443–461. <https://doi.org/10.18267/j.polek.1289>
- Dorożyński, T., Dobrowolska, B., & Kuna-Marszałek, A. (2020). Institutional Quality in Central and East European Countries and Its Impact on FDI Inflow. *Entrepreneurial Business and Economics Review*, Vol. 8, No 1, 91-110. <https://doi.org/10.15678/EBER.2020.080105>
- Dunning, J. H. (1981). The Eclectic Theory of International Production. *Managerial and Decision Economics*, Vol. 2, No. 12, 197–210.

- Dunning, J. H. (2001). The Eclectic (OLI) Paradigm of International Production: Past, Present and Future. *International Journal of the Economics of Business*, Vol. 8, No. 2, 173-190. <http://doi.org/10.1080/13571510110051441>
- Ganic, M. and Hrnjic, M. (2019). Does a country's business regulatory environment affect its attractiveness to FDI? Empirical evidence from Central and Southeast European countries. *Eastern Journal of European Studies*, Vol. 10, No 2, 89-105.
- Ganić, M. and Hrnjić, M. (2021). How Does International Financial Integration Really Affect Post-Transition Countries' Growth? Empirical evidence from the CEE-10 countries. *Journal of Central Banking Theory and Practice*, No 3, 117-136. <http://doi.org/10.2478/jcbtp-2021-0027>
- Gereffi, G. (2005). The Governance of Global Value Chains. *Review of International Political Economy*, Vol. 12, No. 1, 78–104.
- Gherghina, Ș.C., Simionescu, L.N. and Hudea, O.S. (2019). Exploring Foreign Direct Investment–Economic Growth Nexus—Empirical Evidence from Central and Eastern European Countries. *Sustainability*, Vol. 11, No 19, pp. 5421-5454. <https://doi.org/10.3390/su11195421>
- Gibbon, P. (2001). Upgrading Primary Production: A Global Commodity Chain Approach. *World Development*, Vol. 29, No. 2, 345–363.
- Gorynia, M., Nowak, J., Trapeczyński, P. and Wolniak, R. (2019). Geographic patterns of Poland's FDI: the investment development path perspective. *Post-Communist Economies*, Vol. 31, No 4, 507-529. <http://doi.org/10.1080/14631377.2019.1578581>
- Grossman, G.M. and Rossi-Hansberg, E. (2008). Trading Tasks: A Simple Theory of Offshoring. *American Economic Review*, Vol. 98, No. 5, 1978–1997.
- Hirsch, S. (1976). An International Trade and Investment Theory of the Firm. *Oxford Economic Papers*, Vol. 28, No. 2, 258–270.
- Humphrey, J. and Schmitz, H. (2000). Governance and Upgrading: Linking Industrial Cluster and Global Value Chain Research, Working paper 120, IDS, Brighton, 37 p.
- Hungarian Central Statistical Office. (2017a). *Concentration of External Trade in Goods (2013–2016)*, available at: <http://www.ksh.hu> (accessed 15 June 2020).
- Hungarian Central Statistical Office. (2017b). *Number of Enterprises, Imports and Exports by Enterprise Size Class, Types of Enterprise and Owners (2013–2016)*, available at: <http://www.ksh.hu> (accessed 18 August 2020).
- Jarillo, J.C. (1988). On Strategic Networks. *Strategic Management Journal*, Vol. 9, No. 1, 31–41.
- Josifidis, K., Supic, N. and Doroskov, N. (2020). Foreign Direct Investment and Income Distribution: Evidence from Post-Communist New EU Member States. *Eastern European Economics*, No 58:6, 497-516. <http://doi.org/10.1080/00128775.2020.1762496>
- Kamornikov, S. and Shalupayeva, N. (2019). Experimental Modeling of Merchandise Exports Dependence on the Foreign Direct Investment Attracted in the Republic of Belarus. *Proceedings of Francisk Scorina Gomel State University*, No. 2, 111–116.
- Kaplinsky, R. (2004). Spreading the Gains from Globalization: What Can Be Learned from Value-Chain Analysis? *Problems of Economic Transition*, Vol. 47, No. 2, 74–115.
- Kojima, K. and Ozawa, T. (1984). Micro and Macroeconomic Models of Direct Foreign Investment: Towards a Synthesis. *Hitotsubashi Journal of Economics*, Vol. 25, No. 1, 1–20.
- Kosekahyaoglu, L. (2006). A comparative analysis of FDI in Turkey and the CEECs: Is there any link between FDI and trade?. *Journal of Business Economics and Management*, Vol. 7, No. 4, 183-200, available at: <https://doi.org/10.1080/16111699.2006.9636140> (accessed 26 May 2020).
- Markusen, J.R. (2000). *Foreign Direct Investment and Trade*. University of Adelaide, Adelaide, 40 p.
- Markusen, J.R. (2002). *Multinational Firms and the Theory of International Trade*. MIT Press, Boulder, 682 p.
- Misztal, P. (2020). Foreign Direct Investment, Production Factors Productivity and Income Inequalities in Selected CEE Countries. *TalTech Journal of European Studies*, No 10, 146-172. <https://doi.org/10.1515/bjes-2020-0008>
- National Bureau of Statistics of China. (2017). *China Statistical Yearbook 2016*, available at: <http://www.stats.gov.cn/tjsj/ndsj/2016/indexeh.htm> (accessed 15 June 2020).
- Nyikos, G. and Soós, G. (2018). *Public and Private Funds in National Economic Development in Hungary*. Papers from the 26th NISPAcee Annual Conference, available at: https://www.researchgate.net/publication/329375407_Public_and_Private_Funds_in_National_Economic_Development_in_Hungary (accessed 15 December 2020).
- Ozawa, T. (1992). Foreign Direct Investment and Economic Development. *Transnational Corporations*, Vol. 1, No. 1, 27–54.

- Pečarić, M., Kusanović, T., Jakovac, P. (2021). The Determinants of FDI Sectoral Structure in the Central and East European EU Countries. *Economies*, Vol. 9, No 2, 66-82. <https://doi.org/10.3390/economies9020066>
- Penrose, E. T. (1956). Foreign investment and the growth of the firm. *Economic Journal*, Vol. 66, No 262, 220–235.
- Powell, W. (1991). Neither Market nor Hierarchy: Network Forms of Organization. SAGE Publications, London, 306 p.
- Ramasamy, B. and Yeung, M. (2020). China's outward foreign direct investment (OFDI) to developing countries: the case of Central and Eastern Europe (CEE). *Journal of the Asia Pacific Economy*, <https://doi.org/10.1080/13547860.2020.1790182>
- Rugman, A.M. (1986). New Theories of the Multinational Enterprise: An Assessment of Internalization Theory. *Bulletin of Economic Research*, Vol. 38, No. 2, 101–118.
- Rugraff, E. (2010). FDI and Supplier-Oriented Upgrading in the Czech Motor Vehicle Industry. *Regional Studies*, Vol. 44, Issue 05, 627-638.
- Sass M., Gál, Z. and Juhász, B. (2018). The impact of FDI on host countries: the analysis of selected service industries in the Visegrad countries. *Post-Communist Economies*, Vol. 30, Issue 5, 652–674. <https://doi.org/10.1080/14631377.2018.1445332>
- Setiawan, B., Saleem, A., Nathan, R.J., Zeman, Z., Magda, R. and Barczy J. (2021). Financial Market Development and Economic Growth: Evidence from ASEAN and CEE Region. *Polish Journal of Management Studies*, Vol. 23, No. 2, 481-494. <https://doi.org/10.17512/pjms.2021.23.2.29>
- Shalupayeva, N. (2019). Trade-related Effects of Foreign Direct Investment in Recipient Countries: Integrated Approach. *Economy and Banks*, No. 1, pp. 106–115.
- Thorelli, H.B. (1986). Networks: Between Markets and Hierarchies. *Strategic Management Journal*, Vol. 7, No. 1, 37–51.
- Trąpczyński, P., Gorynia, M., Nowak, J., Wolniak, R. (2019). EU Countries from Central and Eastern Europe, and the Investment Development Path Model: A New Assessment. *Argumenta Oeconomica*, No 2 (43), 385-406. <https://doi.org/10.15611/aoe.2019.2.16>
- UNCTAD (2011). World Investment Report 2011: Non-equity Modes of International Production and Development, New York, Geneva, 226 p., available at: <http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=84> (accessed 18 August 2020).
- UNCTAD (2017). World Investment Report 2017: Investment and the Digital Economy. New York, Geneva, 237 p., available at: <http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=1782> (accessed 18 August 2020).
- UNCTAD (n. d.), UNCTAD Data Center, available at: http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en (accessed 10 July 2020).
- UNCTAD. (2012). World Investment Report 2012: Towards a New Generation of Investment Policies. New York, Geneva, 204 p., available at: <http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=171> (accessed 10 July 2020).
- Vernon, R. (1966). International Investment and International Trade in the Product Life Cycle. *Quarterly Journal of Economics*, Vol. 80, No. 2, 190–207.
- Weresa, M. (2001). The Impact of Foreign Direct Investment on Poland's Trade with the European Union. *Post-Communist Economies*, Vol. 13, No. 1, 71-83. <https://doi.org/10.1080/14631370125114>
- WTO (n. d.). Trade in Value-added and Global Value Chains: Statistical Profiles, available at: https://www.wto.org/english/res_e/statistics_e/miwi_e/countryprofiles_e.htm (accessed 15 June 2020).

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DIGITALIZATION AND HUMAN CAPITAL DEVELOPMENT*

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Abstract. The onset of Fourth Industrial Revolution and its related development of digitization processes has created the need to focus more attention on creating the conditions for the development of adequate human resources skills, on which the pace of innovation depends. The digital transformation of economies has become a global trend, so the need to innovate cannot be ignored if countries want to be competitive in international environment. Therefore, particular governments must respond to this situation and take relevant steps to support these processes. However, the situation in each country is diametrically different. Some of them strive to be leaders in a particular field and systematically support the development of ongoing processes. Others are more indifferent to this situation and their progress is much slower. As in the past, at the time of scientific and technical revolution, this attitude is subsequently reflected in their economic situation. There are also significant differences among EU Member States, despite the fact that the EU is trying to set certain development parameters that should be achieved in each country. The goal of this paper is to theoretically define what changes are taking place as a result of digitization, how the current situation has contributed to those changes, and which key areas should be given priority within each country. In addition, our goal is to find out how the population in Slovak Republic is developing in terms of the achieved level of education, what share of expenditures from GDP goes to education area and research and development support, as well as what is the average amount of these expenditures per capita, and thus to point out to the possible reasons of lagging innovation and modernization capacity of Slovak Republic. The method of descriptive statistics, time series analysis as well as the method of synthesis to formulate conclusions were used.

Keywords: digitalisation; labour market; human capital; education; research and development expenditure

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1. Introduction

Digitization and the gradual transition of economies to the digital level have recently become one of the priorities of economic development in most countries. New technologies create new possibilities of operating and change all so far used activities, often even the overall structure of a society; being expected to contribute to the modernization of economies, competitiveness development and living standards raising and the overall level of well-being. The digital transformation affects all areas, including education. Outdated educational systems are going to be a serious issue being not able to prepare graduates with the required characteristics, which in turn affects the operating of all other spheres. The downside is the lack of digital skills in a relatively large part of the population. It usually refers to older generation and socially disadvantaged groups, but large differences in the level of digital skills can also be observed among younger generation as well. However, the obstacle is not only the persistence of education systems in its outdated form, but also the underfunding of key areas related to human capital development and the creation of innovations that is dependent on it. National governments have different approaches to supporting this key area in the future, and there are significant differences within Europe, especially when comparing Western European countries with those ones in Central and South-Eastern Europe. The Covid-19 pandemic and the associated measures regarding social isolation have also shown how important it is to pay attention to creating conditions for digital transformation. The forced reduction of social contacts has accelerated the pace of new digital elements implementation. Many people have been forced to adapt to these changed conditions and learn to cope with technologies they have been trying to avoid so far.

2. Theoretical background

The digital economy and the ongoing processes significantly affect the functioning of all spheres within the world economy, including education systems. In many countries, however, there can be seen stagnation or too slow implementation of changes in this area. This can be a problem in the future due to the need to provide workers with new skills and the ability to take up new professions. These trends in the world therefore raise the need to focus more on human resources issue and the possibilities for their development. In general, formal education is considered to be the most important prerequisite for their development, although many studies suggest that the impact of non-formal education is not negligible, but its contribution is difficult to assess exactly. For this reason, the level of human capital is in some cases assessed only based on a survey regarding the education degree - the highest formal education achieved is determined.

The assessment on the educational level of population is the object of many researches (Šprocha, 2011; Lauko et al. 2012; Poráčová et al., 2021 and others). The authors also examine the impact of educational level on the economic growth of a society (e.g. Marquez-Ramos and Mourelle, 2019; Goczek et al., 2021 and others) and the relationship between the level of education and digital economy (Gupta, 2019; Koroleva and Kuratova, 2020; Miethlich, 2020 and others).

However, when assessing the level of education, several problems can emerge. First, the same levels of education can vary significantly and do not include the degree of human capital depreciation. Secondly, the fact that the number of people with higher levels of education in society is increasing may not be of a sufficient value unless we know in which professional fields these numbers are increasing. If this refers to areas, which will be gradually less and less necessary, the problem may be the so-called technological unemployment. The expected fast pace of technological change could make it impossible for workers to be retrained quickly for new occupations, which in turn will lead to an increase in unemployment rate (Kivarina, Makarevich, 2020). Many other areas that are linked to the economic prosperity of countries will therefore depend on a proper education system setup.

As already mentioned, as a result of ongoing digitization processes, there is a shift towards different ways of economic activity organization (Sundararajan, 2016). That is why the education systems modernization is

necessary, so it is possible to prepare people with the qualifications required by emerging new occupations. In terms of the ongoing digitization and its close connection to Industry 4.0, the Education 4.0 concept comes to the fore, which should include 4 dimensions, such as vocational, financial, business, and digital education (Sima et al., 2020). Education systems in individual countries are undergoing gradual reforms and are enriched with new elements. Nevertheless, the huge potential of digital technologies to improve education remains largely untapped (Abdovakhidov et al., 2021). New technologies not only facilitate and speed up access to information, make it easier to process and store, but also bring new elements to educational processes. If necessary, they can transfer the entire educational process to the virtual space and perform it by means of particular tools without any negative impact on its level. Nevertheless, during the current ongoing pandemic of Covid-19, there are concerns about the insufficient quality of education provided in this way, i.e., concerns if performing in this way in the long run would not lead to a decline in the level of knowledge and skills of pupils and students. Although concerns about the quality decline may be justified and need to be addressed, they cannot overshadow the enormous benefits that such training offers - it can be widely accessible to all. In a situation where, as a result of the pandemic, people were forced to reduce their social contacts to a minimum level, it was the online connection being the element that enabled the smooth continuation of ongoing processes. As far as possible, all activities were moved to this mode. At the beginning, the transition to a new way of working conditions was challenging for both sides - education providers, who in many cases did not have the necessary ICT equipment, but also for its recipients, who were also forced to learn to use ICT in a short time, so far used by them very rarely, maybe never. The crisis caused by the pandemic has accelerated the pace of digitization elements implementation in society, being considered one of its a few positives. Under its influence, many services provided via the Internet, which until then were perceived by most people only as ancillary, have become very necessary.

Regarding education systems digitization, there is a debate on the untapped technology potential, but there are also studies arguing that the effort to digitize individual processes should not be exaggerated. Before using any new trends, goals should be set to be achieved in order to avoid that technologies are implemented in areas where they are not needed at all (Abdovakhidov et al., 2020). While implementing them, the needs of teachers and pupils / students should be taken into account in particular, as well as the opinions of other experts, such as psychologists or IT specialists. It is recommended that the adoption process be gradual and new users would have enough time to adapt to the new way of working processes. This is the only way to achieve the results expected from the digital technologies implementation. If the pace of their implementation had been disproportionately fast, it could have rather provoked a wave of resistance and a negative attitude of potential users towards them.

The significance of digital technologies will gradually increase in all manufacturing and non-manufacturing sectors of the economy. This will put increased demands on higher education system in particular, as higher education is expected to generate human capital, which will be crucial for the future socio-economic development of individual countries (Ershovak et al., 2019). All developed countries are aware that the higher the level of education within a society, the more efficient economy performance, and thus the income and quality of life in the country is increasing. Therefore, investing into higher education and closely related research and development or innovation areas is becoming a priority. Even today, however, it is possible to meet with opinions that deviate from the majority and do not attach such great importance to education. For instance, already in the second half of the 20th century, Randall Collins diverged from the thesis of the interaction between economic growth and increasing the level of human capital, thus creating room for controversy as to whether innovation is a source or a consequence of countries' economic progress. He argued that even a high level of formal education brought nothing to the economy, but on the contrary, the fast pace of economic development in recent times has generated sufficient resources to invest in education, and therefore those two categories are often mistaken to be related (Collins, 1979). According to him, the increase in the number of people with a university degree is a consequence and not the cause of economic boom in individual countries. However, the world development trends show that Collins's view cannot be fully accepted, as those countries that put great emphasis on the quality of education and adapt education systems to new requirements are among the most successful and progressive ones. Of course,

these countries must have a number of other conditions in place, closely linked to each other, first of all, within the potential usage of their people.

Even today, there is a situation where the two mentioned facts are met. The Covid-19 pandemic has created the preconditions for faster digital elements implementation. On the other hand, the economic crisis, the signs of which appeared as early as 2019 and was accelerated by the pandemic outbreak, may pose a problem within the digital infrastructure development (Ganichev, Koshovets, 2021). The decline in industrial production, which occurred in most countries, also caused a decline in GDP. This, together with anti-crisis measures aimed at supporting the most affected areas, has drained a significant part of government resources, which is likely to reduce next funding for the digital infrastructure development support.

Observing the investment into human capital and education systems adaptation to the new requirements arising from the digital transformation of society is an essential issue because these processes have crucial impact on labor market performance. The attention is focused primarily on possible risks. The highlighted issues are the social inequalities intensification, the insufficient ability of some groups of workers to develop their digital knowledge and skills, and the question regarding the extent to which the digital economy creates conditions for human potential development due to automation and robotics being implemented within a large part of production processes (Davydova et al., 2020). The modernization of labour market should take all these facts into account and should aim at information transparency increasing, mobility enhancement, information technology skills improvement or human potential realization enhancement. In the long run, digitalization is expected to reduce labour demand, increase atypical forms of employment, and widen the salary gap within occupations; and this is one of the reasons why the flexibility of potential employees' incensement needs to be highlighted. In addition to the changing conditions related to labour market performance, attention should be paid to the adaptation of social security systems to these new conditions and in this context the concept of unconditional basic income as a solution to deal with the technological unemployment needs to be considered (Jepsen, Drahokoupil, 2017).

Technological unemployment appears to be the biggest threat in the digital economy, but the extent to which it will be presented is difficult to predict. Many jobs are already being lost in certain sectors, and forecasts point to an even faster pace of job losses. However, these forecasts need to be seen with some caution, as the mere possibility of automation and digitization does not mean that it will actually be reflected in all areas where its implementation is being considered, as there are many economic, legal and other regulatory constraints that cause significant time delays between the new technologies' discovery and their spread within the global economy (Islam, 2018). Although technological unemployment poses a threat, it does not necessarily mean the job loss. This is also evidenced by the development of many developed countries, in which, although many jobs have recently been displaced in certain sectors of the economy, many new ones have been created in other emerging, more promising sectors in the future. It is precisely these changes that are changing the structures of individual economies that should be the impetus to point out to the need to prepare people with new qualifications for the labour market.

In terms of labour markets performance, within individual countries there are efforts to determine the level of digital skills within the population. In Slovak Republic, the initiative is being developed in this direction mainly by the Digital Coalition - the national coalition for digital skills and professions of Slovak Republic. In 2021, for the tenth time in cooperation with other institutions (especially the Ministry of Education, Science, Research and Sport of Slovak Republic), it offers opportunities for pupils, students and teachers, as well as general public to find out the level of their digital skills bay means of the IT Fitness Test, which includes five areas: internet, security and computer systems, complex tasks, office and collaborative tools and social networks. The results from previous years show that a large part of the population still has underdeveloped classic office skills, which are one of the basic conditions to be successful on labour market. On the positive side, the test results are improving slightly each year and this trend is expected to continue in the upcoming years. In 2020, there was even

a significant improvement in digital skills. Experts explain this by saying that people have been forced to use digital technologies much more, and this has led to a bigger increase in these skills. During this period, many companies, whose approach to them was previously reserved, also realized the significance of digital technologies implementation and tried to avoid their implementation as long as possible. Although the situation has improved, the data available on Eurostat show that Slovak Republic still lags quite significantly behind many European countries regarding the digital skills level of the population. Even half of the Slovak population still does not have basic digital skills, while e.g. in Scandinavian countries or Iceland, this share is only around 20%.

3. Research objective and methodology

The goal of this article is to theoretically define what changes are taking place as a result of digitization, how the current situation has contributed to those changes, and which key areas should be given priority within each country. In addition, our goal is to find out how the population of Slovak Republic is developing in terms of the achieved level of education, what share of expenditures from GDP goes to education area and research and development support, as well as what is the average amount of these expenditures per capita, and thus to point out to the possible causes of lagging innovation and modernization capacity of Slovak Republic.

Several scientific methods to process the paper were used. By means of descriptive method the phenomena and processes in the theoretical part of the paper were described. The methods of induction, deduction, analysis, or synthesis have also been used several times. It was also necessary to apply the method of abstraction, as the researched issue includes a large number of features and contexts, and in order to be able to elaborate the selected ones in depth, it was necessary to abstract them from the others. In the empirical part of the paper, we focused on quantitative research. While observing the selected indicators development, several statistical methods were applied. By means of the time series analysis, the share of expenditures on research and development was examined, along with the share of expenditures on education in the years of 2010-2019 in Slovak Republic and selected EU countries. The time series analysis to have a higher informative value, within the value of expenditures on research and development per capita, a geometric mean was also calculated, which removes the distortions caused by the existence of extreme values. Subsequently, the comparison method to compare the situation in the observed countries was used. The dependence size among the development of examined indicators was determined by the correlation analysis. The synthesis method to formulate conclusions was also used. Through the methods used, we managed to meet all the set goals.

The statistical data is drawn from the Eurostat database and from the database of the Statistical Office of Slovak Republic.

4. Results and discussion

The level of education within the population, and especially working-age population, is the object of many scientific studies, which show that the share of the population with higher education is increasing in developed countries. The same scenario can be observed in Slovak Republic. Šprocha (2014) even claims that there is a historically unique increase within the level of education, it is the dynamic increase regarding the number and especially the share of university graduates within younger generations. Figure 1 shows the development of the number of university students and the structure of the population in Slovak Republic in terms of the level of education.

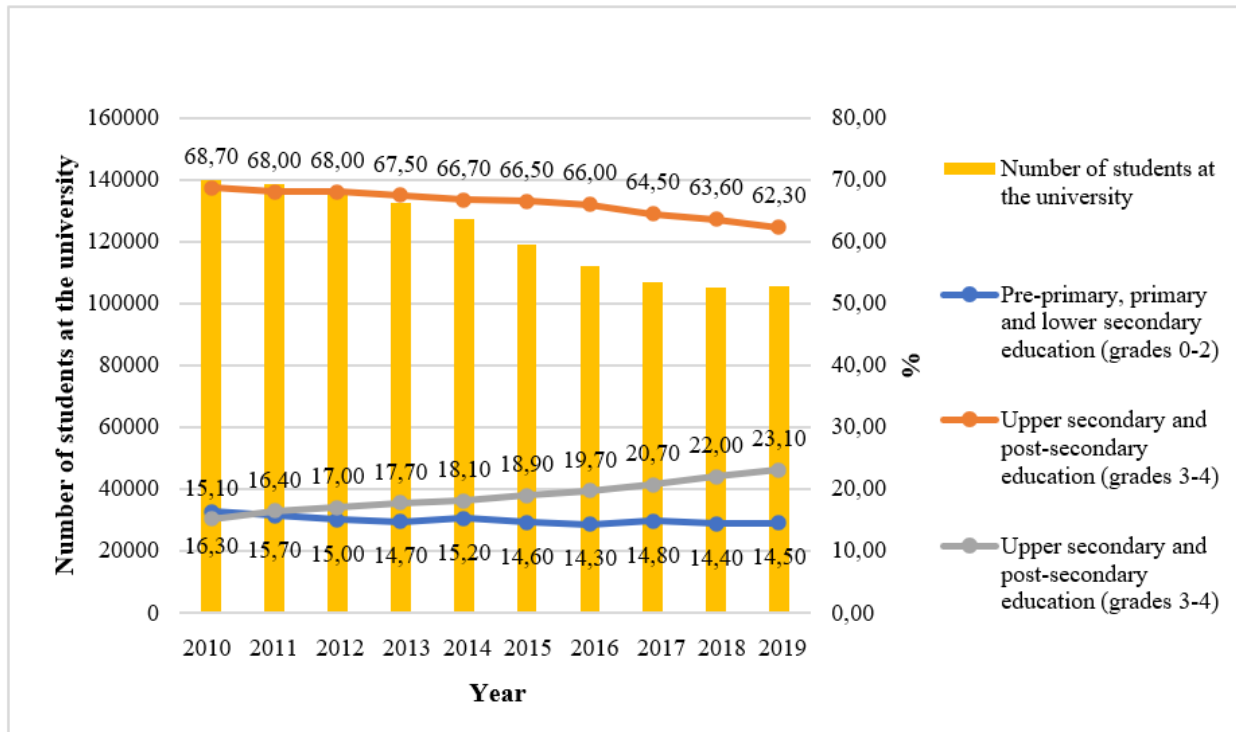


Figure 1. Number of students at universities and structure of the population of the Slovak Republic by education

Source: Statistical Office of the Slovak Republic (2021), own processing

In the observed period, the share of people with tertiary education in the population aged 15-64 increased and the share of people with upper secondary but also primary and lower secondary education decreased. Since 2010, the share of university graduates in the 15-64 age group has increased by 8 percentage points: from 15.1% in 2010 to 23.1% in 2019. On the contrary, the share of people with upper secondary and post-secondary education has decreased since 2010 from 68.7% to 62.3% in 2019, i.e. by 6.4 percentage points. The number of people with pre-primary, primary and lower secondary education also decreased, but only slightly, from 16.3% in 2010 to 14.5% in 2019 - a decrease of 1.8 percentage points in this category. Even though the share of the population with tertiary education is increasing, the number of students at universities is declining every year. However, this situation is not caused by the insufficient interest of young people to study, but especially by demographic development, or to a lesser extent by the increasing number of students going to study abroad.

Opponents of mass education at colleges and universities argue that the number of people with a university degree is increasing unnecessarily and that secondary school education would suffice for many jobs. However, in certain areas, people with a university degree are preferred. As an example, it is possible to mention the field of ICT (Figure 2).

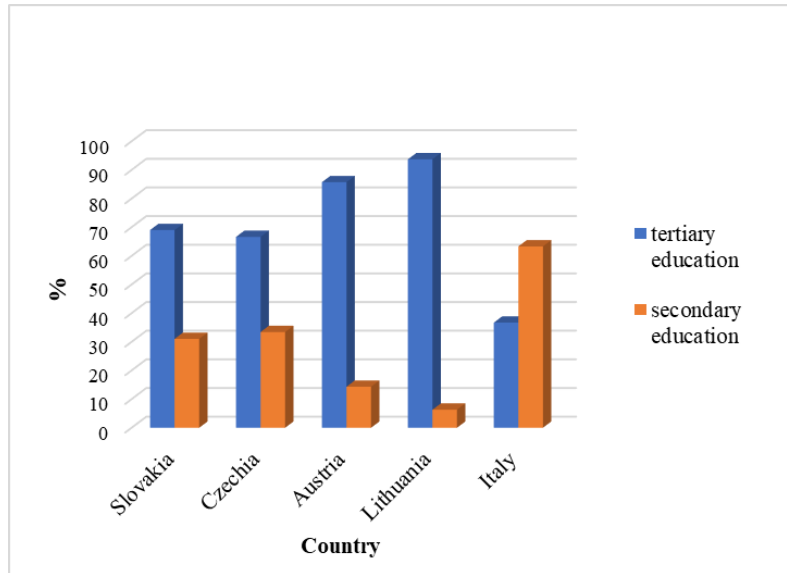


Figure 2. Employed ICT specialists by educational attainment level in 2020

Source: Eurostat (2021), own processing

In most European countries, most people working in ICT area have a university degree. Also, on job portals in job offers in this area, first or second-degree of university education is usually mentioned as a requirement for applicants. In Slovak Republic 69% of employees working in this area have a university degree, in Czech Republic it is 66.6% of employees. In most countries, this share is even higher, e.g., in Austria 85.7% and in Lithuania up to 93.7%. There are few countries in which people with a secondary education predominate in this area, and most of them are countries that are also lagging behind in terms of the innovation implementation and the pace of digitalization in the economy, e.g. in Italy, only 36.7% of ICT employees account for higher education, and 32.1% of all employees in Portugal. However, it is not necessary to look at this fact only negatively, as there are differences among countries in the achieved levels of education and the quality of graduates within individual degrees is difficult to compare on an international scale.

The digital economy and the new opportunities it creates for more efficient functioning of education systems are closely linked to the implementation of innovation. For this reason, R&D spending, which is a driver of innovation, is very often observed in individual countries. Due to the possibility of international comparison, not only the absolute share of R&D expenditure is observed, but also the development of R&D intensity. R&D intensity is expressed as a percentage of R&D expenditure to GDP. In Figure 3 we see the development of the share of expenditures on research and development in Slovak Republic and the share of expenditures on GDP.

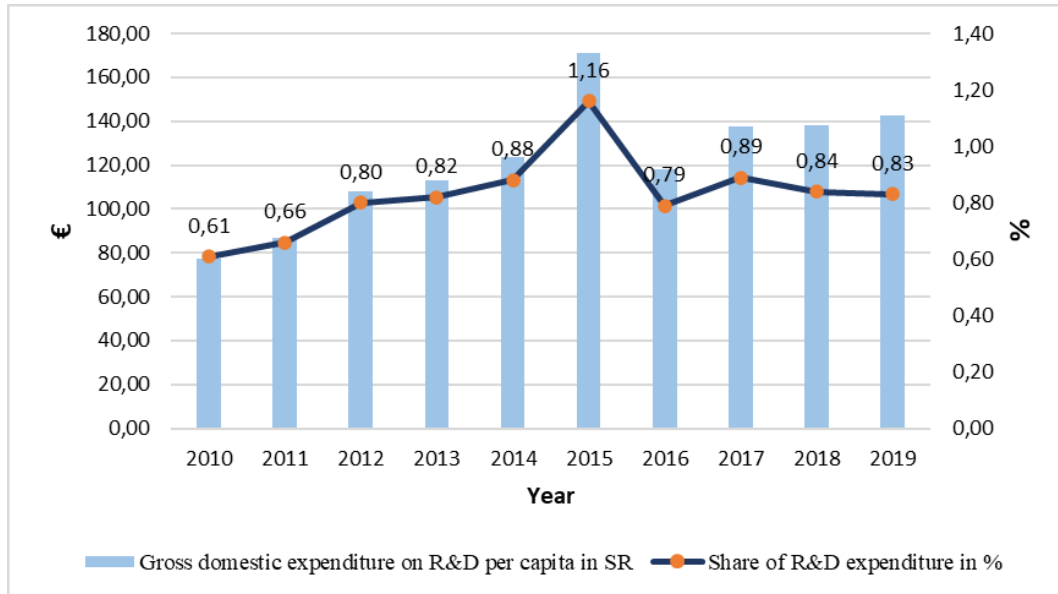


Figure 3. Gross domestic expenditure on research and development in SR

Source: Eurostat (2021), own processing

In the observed period, the research intensity in Slovak Republic increased slightly. Until 2015, the share of R&D expenditure in GDP increased every year and for the first time exceeded 1%. In the following year, however, there was a more significant decline and the research intensity in Slovak Republic got back to approximately the same value as in 2012. In recent years, it has remained at values between 0.8 and 0.9% so the EU goal to spend at least 3% of GDP on research and development will probably remain unattained for a long time in Slovak Republic.

If we look at the expenditures spent on research and development in relation to the population, in Slovakia in 2019 they accounted for almost 143 EUR per capita. The highest values were achieved in 2015 - 171 EUR per capita, while the lowest in 2010 - only about 77 EUR per capita. As no significant differences within the amount of GDP were recorded in the observed period, the amount of expenditures per capita in Slovak Republic was largely influenced by the share of expenditures on research and development in GDP. This assumption was also confirmed by a correlation analysis (Figure 4), which was used to determine the relationship between the share of R&D expenditure in GDP and its amount per capita.

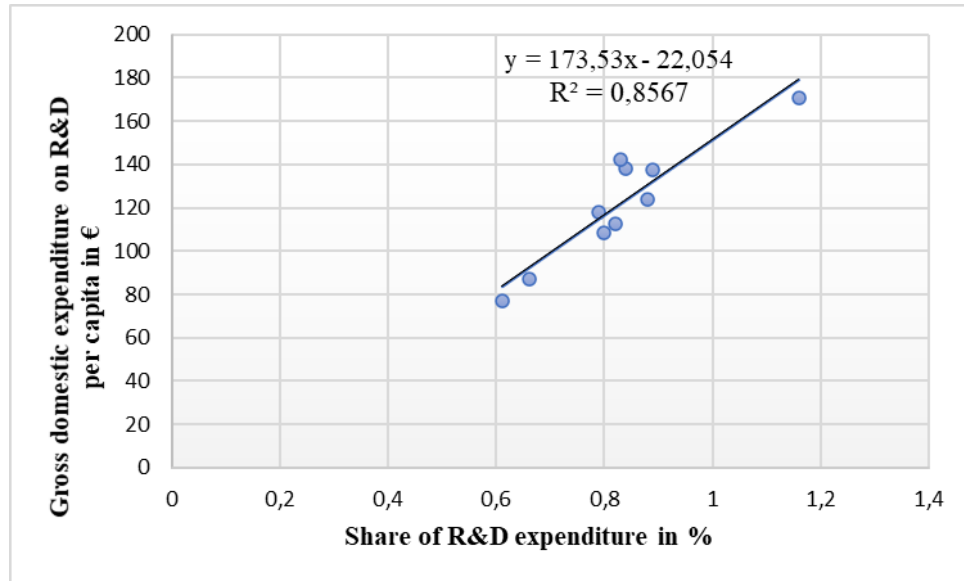


Figure 4. Dependence between the share of R&D expenditure in GDP and its value per capita

Source: own processing

The calculated value of the correlation coefficient was 0.925581. This means that the dependence among the variables examined is very high and the only possible way to increase the R&D expenditure per capita is to increase the % of GDP earmarked to support this area. The coefficient of determination reached a value of 0.8567, which means that up to more than 85% of the total variability is explained by the model and a linear relationship was correctly determined among the selected variables. The regression function has the form $y = 173.53x - 22.054$.

Although the research intensity in Slovakia has slightly increased, Slovakia is still at the bottom of European countries rankings. The average share of research and development expenditure in EU countries has been around 2.2% in recent years (2.19% in 2019). However, there are significant differences among countries. While in some the share of R&D expenditure in GDP exceeds 3% (Sweden 3.39%, Austria 3.19%, Germany 3.17%), in others it is well below 1% (Romania 0.48%, Malta 0.61%, Cyprus 0.63%, Latvia 0.64 %, Ireland 0.78%, Slovakia 0.83%, Bulgaria 0.84% and Lithuania 0.99%).

Table 1. Value of expenditure on research and development per capita in € /% of GDP

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Geometric mean
Czechia	200	243	274	285	294	308	281	325	378	408	294
	1,33%	1,54%	1,77%	1,88%	1,96%	1,92%	1,67%	1,77%	1,90%	1,93%	1,75%
Romania	28	33	32	28	29	39	41	48	52	55	37
	0,46%	0,50%	0,49%	0,39%	0,38%	0,49%	0,48%	0,50%	0,50%	0,48%	0,46%
Slovakia	77	87	108	113	124	171	118	138	138	142	119
	0,61%	0,66%	0,80%	0,82%	0,88%	1,16%	0,79%	0,89%	0,84%	0,83%	0,82%
Sweden	1 271	1 397	1 465	1 508	1 411	1 504	1 537	1 615	1 545	1 579	1 480
	3,17%	3,19%	3,23%	3,26%	3,10%	3,22%	3,25%	3,36%	3,32%	3,39%	3,25%
Hungary	135	144	150	167	168	176	158	191	233	244	173
	1,36%	1,41%	1,49%	1,63%	1,56%	1,54%	1,33%	1,47%	1,67%	1,63%	1,50%
Austria	966	988	1 105	1 132	1 208	1 223	1 281	1 287	1 373	1 432	1 190
	2,73%	2,67%	2,91%	2,95%	3,08%	3,05%	3,12%	3,06%	3,14%	3,19%	2,99%

Source: Eurostat (2021), own processing

If we look at the amount of expenditure on research and development per capita (Table 1) in some other European countries (e.g. in Hungary 221 EUR, in Czech Republic 408 EUR, in Austria 1,432 EUR per capita), it is clear that Slovak Republic within the innovation capacity is lagging far behind these countries. The amount of expenditure on research and development per capita is related not only to the size of their share in GDP, but also to the level of GDP as such. In Romania the GDP per capita was the lowest within the observed countries, there is also the least investment in research and development - on average 0.46% and the average amount of expenditure per capita is only 37 EUR. Hungary has the second lowest GDP per capita within these countries, but the investment share in % of GDP is higher in the field of research and development than in Slovak Republic, so the average amount of expenditure on research and development per capita there is higher than in Slovak Republic - it is 173 EUR, being on average by 54 EUR more than in Slovakia. In Czech Republic, this was on average 294 EUR per capita during the observed period. The situation is diametrically different in Austria and Sweden, which meet the EU criterion and have spent more than 3% of GDP on R&D expenditure in recent years. In Austria, the average amount of R&D expenditure was 1,190 EUR, which is 10 times more than in Slovak Republic, in Sweden it was on average 1,480 EUR, which is even 12.4 times more.

Slovakia's lack of innovative capacity is also pointed out by its places in various rankings. For example, since 2016, the Institute for Management Development has been showing digital competitiveness in 63 countries and assessing the extent to which the country is engaged in research and digital technologies implementation, with the goal to contribute to the overall society transformation. In 2019, Slovak Republic ranked 47th spot. Within the European Union, the Digital Economy and Society Index (DESI) is compiled annually and consists of 34 indicators. This index evaluates the development of individual EU countries in accordance with the effectiveness of their transition to digital economy. Even within the evaluation of this index, Slovak Republic lags behind and ranks among the worst evaluated countries, behind the EU average.

Next, we will focus on the share of expenditure on education in GDP (Table 2) and compare the situation in Slovak Republic with the situation in other European countries, having been also included in previous analysis.

Table 2. General government expenditure on education (% of GDP)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Slovakia	4,6	4,3	4	4,1	4	4,2	3,9	3,9	4	4,2
Czech Republic	4,6	4,6	4,5	4,5	4,5	4,4	3,9	4,1	4,6	4,9
Hungary	5,5	5,1	4,7	4,7	5,2	5,2	5	5,1	5	4,7
Austria	5,1	5	5	5	4,9	4,9	4,9	4,8	4,8	4,8
Romania	3,3	4,1	3	2,8	3	3,1	3,3	2,8	3,2	3,6
Sweden	6,4	6,3	6,4	6,5	6,5	6,4	6,6	6,7	6,9	6,9
EU average	5	4,9	4,9	4,9	4,9	4,8	4,7	4,7	4,7	4,7

Source: Eurostat (2021)

There are no significant differences among countries regarding the expenditure amount on education in GDP as in the share of expenditure on research and development in GDP. Slovakia is approaching the EU average, which was 4.7% in 2019, of which expenditure on pre-primary and primary education accounted for 1.6% of GDP, expenditure on secondary education 1.8% of GDP and expenditure on tertiary education reached 0.8% of GDP. Slovak Republic is at a similar level as Czech Republic, Hungary and Austria, i.e. the field of education in our country is not as significantly underfunded as the field of research and development. In the observed period, the share of expenditure on education in GDP did not change significantly in any of the observed countries, it remained at relatively stable figures. Iceland (7.1% of GDP) and Sweden (6.9% of GDP) achieved the highest share of education expenditure among EU countries in 2019. This share was lowest in Ireland (3.1%) and Romania (3.6%). Bulgaria and Italy (3.9%), which were not included in the table, also spend less than 4% of GDP on education.

Conclusions

The evidence of digital transformation can be seen in all areas of social life. It affects not only the functioning of manufacturing companies, but also the provision of services. Today, personal contact of a client with clerk is not so necessary when it comes to paperwork, but the whole process can be done electronically through ICT from the comfort of home. The same trend exacerbated by the impact of Covid-19 pandemic can be observed in the functioning of educational processes. It is obvious that personal contact will never be completely replaced by technology, as people are a social human beings and long-term separation from society often leads to psychological problems, but an adequate level of digitization brings far more positives than negatives. Therefore, the attention is rightfully focused on increasing the level of human capital, but also the development of digital skills within the population. On one hand, education systems need to be updated and able to train people with new skills. On the other hand, we must not forget to create conditions in which people will be able to apply the acquired skills. These two issues cannot be separated from each other, because only with their common development a comprehensive advance of a society can be achieved. Of course, there is no need to increase only aimlessly artificially the number of people with a university degree and to increase the share of public expenditure earmarked for education or research and development. The crucial issue is which sectors are promising and soon there will be an increased demand for them on labour market, as well as to which areas of research and development the increased expenditures should be oriented. The research limitation is that our research is based on quantitative indicators, but some authors argue that the quality of human capital must be expressed comprehensively also through qualitative indicators (Hanushek & Woessmann, 2012). Another limitation is that the impact of human capital quality on economic indicators cannot be reliably determined in this kind of research (Diebolt & Hippe, 2019).

References

- Abdudevkhidov, A.M., Mannapova, E.T., & Akhmetshin, E.M. (2021). Digital Development of Education and Universities: Global Challenges of the Digital Economy. *International Journal of Instruction*, 14 (1), 743–760. <https://doi.org/10.29333/iji.2021.14145a>
- Collins, R. (1979). *The Credential Society. An Historical Sociology of Education and Stratification*. New York, San Francisco & London: Academic Press, 222 p.
- Davydova, T., Avdeeva, A., Amichba, L., Zhutaeva, E., & Vorotyntseva, A. (2020). The labour market in the digital economy and features of its modernization in Russia and Abkhazia. *IOP Conference Series: Materials Science and Engineering*, 890 (2020) 012196. <https://doi.org/10.1088/1757-899X/890/1/012196>
- Diebolt, C. & Hippe, R. (2019). The long-run impact of human capital on innovation and economic development in the regions of Europe. *Applied Economics*, 51(5), 542–563. <https://doi.org/10.1080/00036846.2018.1495820>
- Ershova, I., Belyaeva, O., & Obukhova, A. (2019). Investment in human capital education under the digital economy. *Economic Annals-XXI*, 180 (11-12), 69–77. Retrieved May 18, 2021 from <https://10.21003/ea.V180-08>
- Eurostat. (2021). *Statistics A-Z*. Retrieved from <https://ec.europa.eu/eurostat/data/statistics-a-z/def>
- Hanushek, E.A., & Woessmann, L. (2012). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth*, 17, 267–321 (2012). <https://doi.org/10.1007/s10887-012-9081-x>
- Ganichev, N. A., & Koshovets, O. B. (2021). Forcing the Digital Economy: How will the Structure of Digital Markets Change as a Result of the COVID-19 Pandemic. *Studies on Russian Economic Development*, 32 (1), 11–22. <https://10.1134/S1075700721010056>
- Goczek, L., Witkowska, E., & Witkowski, B. (2021). How Does Education Quality Affect Economic Growth? *Sustainability*, 13 (11), 6437. <https://doi.org/10.3390/su13116437>
- Gupta, G. (2019). Education and Digital Economy: Trends, Opportunities and Challenges. ICMLT 2019: Proceedings of the 2019 4th International Conference on Machine Learning Technologies, June 2019, 88–92. <https://doi.org/10.1145/3340997.3341013>
- IMD. (2020). *IMD World Digital Competitiveness Ranking 2020*, 182 p. Retrieved from <https://www.imd.org>
- Islam, I. (2018). Automation and the Future of Employment: Implications for India. *South Asian Journal of Human Resources Management*, 5 (2), 234–243. <https://doi.org/10.1177/2322093718802972>
- Jepsen, M., & Drahekoupil, J. (2017). The digital economy and its implications for labour. The consequences of digitalisation for the labour market. *Transfer*, 23 (3), 249–262. <https://doi.org/10.1177/1024258917714659>
- Kivarina, M., & Makarevich, A. (2020). Economic research and education in the era of digital economy. *E3S Web of Conferences TPACEE-2019*, 164. pp. <https://doi.org/10.1051/e3sconf/202016412006>
- Koroleva, E., Kuratova, A. (2020). Higher Education and Digitalization of the Economy: The Case of Russian Regions. *International Journal of Technology*, 11 (6), 1181–1190. <https://doi.org/10.14716/ijtech.v11i6.4431>
- Kučera, P., & Jakab, F. (2020). *IT Fitness test: záverečná správa (IT Fitness test: final report)*. 51 p. Retrieved June 3, 2021 from <https://digitalnakoalicia.sk/wp-content/uploads/2021/01/IT-Fitness-Zaverecna-Sprava-2020.pdf>
- Lauko, V., Guriňák, D., Križan, F., & Tolmáči, L. (2012). Najnovšie vývojové trendy vzdelanostnej štruktúry obyvateľstva Slovenska v časovo-priestorových súvislostiach (The latest development trends in the educational structure of the population of Slovakia in a spatio-temporal context). *Geographia Cassoviensis*, 6 (2), 91–102. Retrieved from https://uge-share.science.upjs.sk/webshared/GCass_web_files/articles/GC-2012-6-2/09_Lauko_akol_tlac2.pdf
- Marquez-Ramos, L. & Mourelle, E. (2019). Education and economic growth: an empirical analysis of nonlinearities. *Applied Economic Analysis*, 27 (79), 21–45. <https://doi.org/10.1108/AEA-06-2019-0005>

Miethlich, B., Kvitka, S., Ermakova, M., Bozhko, L., Dvoryankin, O., Shemshurina, S., & Kalyakina, I. (2020). Correlation of Educational Level, Labor Potential and Digital Economy Development in Slovakian, Ukrainian and Russian Experience. *TEM Journal*, 9 (4), 1597–1605. Retrieved from https://www.temjournal.com/content/94/TEMJournalNovember2020_1597_1605.pdf

Poráčová, J., Zahatňanská, M., Nagy, M., Konečná, M., Mydlárová Blaščáková, M., Sedlák, V., & Tkáčová, R. (2021). Tertiary education in EU countries. *Opus et Educatio*, 8 (1), 54–60. <http://dx.doi.org/10.3311/opec.421>

Rodrigues, A.L., Cerdeira, L., Machado-Taylor, M.d.L., & Alves, H. (2021). Technological Skills in Higher Education—Different Needs and Different Uses. *Education Sciences*, 11, 326. <https://doi.org/10.3390/educsci11070326>

Sima, V., Gheorghe, I.G., Subic, J., & Nancu, D. (2020). Influences of the Industry 4.0 Revolution on the Human Capital Development and Consumer Behavior: A Systematic Review. *Sustainability*, 12 (10), 4035. <https://doi.org/10.3390/su12104035>

Slovenská sporiteľňa. (2020). *Analýzy: Výdavky na výskum a vývoj cieľ stále nedosiahli*. Retrieved May 7, 2021 from <https://www.slsp.sk/sk/aktuality/2020/12/8/vydavky-na-vyskum-a-vyvoj-ciel-stale-nedosiahli>

Statistical Office of the Slovak Republic. (2021). *Databases*. Retrieved from <https://slovak.statistics.sk/wps/portal/ext/Databases/>

Šprocha, B. (2011). Regionálne rozdiely v štruktúre obyvateľstva podľa najvyššieho dosiahnutého vzdelania a vnútorná migrácia na Slovensku (Regional differences in the structure of the population according to the highest educational attainment and internal migration in Slovakia). *RELIK 2011: sborník příspěvků: 4. mezinárodní konference: Praha, 5.-6.12.2011*. Slaný: Melandrium. Retrieved from <https://relik.vse.cz/2011/sbornik/download/pdf/179-Sprocha-Branislav-paper.pdf>

Stavytskyy, A., Kharlamova, G., & Stoica, E. A. (2019). The Analysis of the Digital Economy and Society Index in the EU. *Baltic Journal of European Studies*, 9 (3), 245–261. <https://doi.org/10.1515/bjes-2019-0032>

Sundararajan, A. (2016). *The Sharing Economy. The End of Employment and the Rise of Crowd-Based Capitalism*. MIT Press Ltd, 256 p. Výdavky na výskum a vývoj v EÚ v roku 2019. Retrieved May 7, 2021 from <https://eraportal.sk/aktuality/vydavky-na-vyskum-a-vyvoj-v-eu-v-roku-2019/>

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FIXING A PAYOUT RATIO BY DIVIDEND POLICIES: A CASE OF THE UTILITY SECTOR

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Abstract. The dividend policy presents an important tool to decide whether to pay or with hold the earning. The resolute information about purchasing shares and subsequent dividends show the future prosperity of the company and its position on the market. The article aims at analysing the development of the payout ratio estimated from the current dividend policy of ČEZ Company. CEZ is one of the most important suppliers and producers of electricity in the Czech Republic. The majority owner of the company is the Czech state. It can be stated that the area of operation does not only cover the Czech market, because ČEZ company also operates in other countries, mainly in Central Europe. For this reason, it is very interesting to watch the development of this power giant in terms his dominant role in a small and open economy such as the Czech Republic. The data extraction from company annual reports of 2008-2018 allows the correlation analysis to collect and interpret data on the payout ratio adequacy, examining the actual state of the company, earning distribution and corporate expectations from the market. The earning has a visibly positive impact on the payout ratio. The article offers advice for the organization changes to generalize achieved results, subsequently passing on advice for the whole segment.

Keywords: payout ratio; dividends; dividend policy; funding; earning

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1. Introduction

Proposing the number of dividends presents one of the most important events in capital markets in Central Europe. For ČEZ Company, this challenge involves increased activity and lengthy discussions, the reasons being, apart from others, a launched plan to build a new nuclear block in the area of Dukovany with estimated overnight price 140-150 Bill. CZK (ca 6 Bill EUR). The state as the majority owner of ČEZ, where dividends present huge earnings of the national budget, must consider that the organization is subject to substantial energetic changes caused by the wave of liberalization at the end of 1990s (Šuleř, Horák and Krulický, 2020; Iovino and Migliaccio, 2019; Rybáček, 2018).

The cornerstone of the company dividend policy is the term ‘Payout ratio’, consisting of two parts. The first one tells us which part of the net profit after taxation to pay to shareholders in the form of dividends, whereas the second component informs on the amount remaining for the company after re-investments and business evaluation (Vlachý, 2018; Čaha, 2017). This indicator refers to the specific dividend policy of the company.

Nowadays, we have 3 different models of dividend policies, the most common in the Czech Republic being announcing dividends according to the net income. ČEZ Company officially pursues the policy of maintaining the fixed dividend totals, thus being deeply dependent on the company net profit, with the view to avoiding potential risks incurred from wrongly choosing the payout ratio, cash-flow insolvency and failure to perform obligations. Between 2017 and 2018, the corporation followed the dividend policy of the temporary extension of the payout ratio 60%-100%, as contrasted with former 60%-80%, of the consolidated net income. As of 2019, ČEZ developed the existing dividend policy from 80% to 100% of the net profit (Annual report ČEZ, 2018, 2019).

Fixing an optimum payout ratio presents an important aspect for companies. The decision is not easy to make, as enterprises must take into account two crucial elements. On the one hand, the corporation strives for exploiting available internal resources for further funding and business re-investments; on the other, it must pay owners dividends for its investments to their satisfaction.

The question is how to set the adequate amount of the payout ratio, i.e. investors’ dividends. Having invested his capital, the shareholder would ideally expect the highest returns with the lowest risk and hugest liquidity. By investing in the company, he takes on the risk of losses and stock rate fluctuations from poor management, rendering the optimistic scenario impossible. The corporation is aware that choosing an inept payout ratio poses a risk, which may result in failing its obligations.

The article focuses on analysing the development of the payout ratio according to the earning of ČEZ in 2008-2018, concluded by professional advice not only for the given enterprise but also the entire segment of similar companies.

2. Literature Review

The professional literature has conducted painstaking research in paying dividends and payout ratios as an important financial indicator. The first issue is its amount, which has always been a subject of considerable discussions on corporate finance. A large number of scientists have been dealing with theoretical dividend models for a long time Jing et al. (2017), focusing on changes in the company’s characteristics and the follow-up dividend development (Fama and French, 2001). Floyd et al. (2015) argue that these models describe factors playing an essential role in deciding on dividends. This resolution is crucial for company investors, as it provides feedback to the corporation to use earnings for re-investments to evaluate the enterprise, while shareholders see the importance in the earning distribution into their dividends. Grullon et al. (2002) state that changes in dividends are dependent on differences in the company’s growth rate and returns on investments. Some theories on dividends suggest that dividend variations contain information on future enterprise incomes (Benartzi et al., 1997).

When investing, all investors expect maximum earnings, minimal risk and maximal liquidity. Models that play a crucial role in investors' decisions in corporate companies to protect their interests, or in the decision-making of municipal managers from the time of stability to the pandemic, can be found, for example, in the works of Kelemen et al. (2021) and Polishchuk et al. (2019). During this period, even more emphasis is placed on management in an effort to achieve profitability and avoid risk (Bacik et al., 2019; Dvorský et al., 2021). Professional experts Havlíček and Stupavský (2013) call it the investment triangle – the required income from a

specific property, the minimal threat of not reaching the expected earnings and maximal liquidity to realize the investment at the lowest possible costs. The investor should ideally achieve all three goals, which is completely impossible. Subject to frauds, no investments meet all three requirements.

Other professionals also agree upon the basic principle of achieving only two of the three goals at a time. Kohout (2014) points out the importance of compromises, which is confirmed by Rejnuš (2014) referring to sacrificing the fulfilment of a particular objective to attain a higher, yet uncertain, future value.

On the contrary, Miller and Modigliani, pioneers to this issue, claim that when deciding upon earning distribution and follow-up dividends, the company management considers important available investment opportunities which would boost future earnings. Without making these conveniences possible, the income should go to shareholders (Miller and Modigliani, 1961).

There are several criteria to pay out or withhold dividends, the most significant being the company net profit. All incomes, irrespective of them coming from the previous or current period, need cleaning. The next factor, frequently mentioned by Gill et al. (2010) can be the corporate strategy or a phase of the company's life-cycle.

The dividend payout ratio raises a contentious issue analysed to the point of the impact on stock yields or their effects on liquidity. Ansem (2009) has recently examined the influence of the amount of dividend payout on earnings and stock price dynamics. Georgen et al. (2005) claim that changes in dividends in German companies moulded the opinion on the net income being the main reason for dividend changes. Other researchers – Tan et al. (2018) used a system of Hamilton-Jacobi-Bellman generalized equations for determining the optimal ratio, which is also highly supported by (Barth et al., 2016). Other experts, e.g. Ye et al. (2019) state that the earning plays a decisive role for paying or withholding dividends, explaining the earning rate presents a crucial factor to pay out dividends, concluding that a more profitable and liquid corporation has higher chances to pay out dividends. Gill et al. (2010) found and established an intimate connection between the dividend payout and company's earning rate, arguing that the profitability of a specific organization constitutes an essential element of the dividend payout determination on the capital market.

Fidrmuc et al. (2010) declare that components shaping the dividend policy also point in the right direction, making this specific strategy a widely discussed topic in the professional literature. The dividend payout ratio became one of the leading indicators used for analysing dividend schemes (Dragota et al., 2019). Situations when corporations do not always pay shareholders 100% earning, setting aside a certain amount to invest in company's assets, refer to the dividend policy that consists of paying a specific amount to shareholders in the form of dividends, sparing the other amount for re-investments, with the view to boosting higher future earning and shareholders' dividends.

Insider trading presents the next essential factor to determine the payout ratio. Anderson et al. (2020) and Balachandran et al. (2019) argue that companies with a higher insider trading rate have higher payout ratios than corporations owned by foreign institutions. Tran (2020) says that foreign investments negatively influence the effectiveness of national organizations on the Vietnamese market. Kim et al. (2017) analysed the same area classifying individual investors, claiming that active investors directly affect cutting down on reserves and increasing dividend payouts.

Zainudin et al. (2018) explore relations between stock price volatility and dividend policies of publicly negotiable companies in Malaysia, declaring the dividend rate reliably predicts the development of a specific stock. Kahle and Stulz (2017) spotted a rapid growth in publicly negotiable corporations on the American market within the last decade, while dividend payouts reached record values. The authors explain the trend by growing fusions,

globalization and technological changes. Herwartz et al. (2016) present consumption growth volatility as one of the determinants long-term influencing the dividend rate.

Koussis and Makrominas (2019) examine differences between the dividend payout ratio in the US and European banks, emphasizing the importance of the risk assessment and different regulatory environment. Farooq and Ahmed (2019) reveal that the presidential election period has a deep impact on the American market when companies pay increased dividends contrary to common seasons. The next hypothesis aims at the influence of re-investment dividend schemes in publicly negotiable corporations, analysed by Bond et al. (2019), suggesting that enterprises re-investing dividends rely less on external funding, which at the same time leads to more aggressive investments, contrary to firms paying only financial dividends.

The dividend rate and the related corporate strategy comprise a composition criterion within the evaluation index of company performance using logistic regression (Mun and Jang, 2019; Huang and Zheng, 2017). Geyer-Klingberg et al. (2019) apply the dividend rate, capital costs, debt ratio and interest coverage rate to explore the heterogeneity of determinants of corporate security by meta-regression analysis. Charles, et al. (2017) focus on the effectiveness of ratio predictors such as dividend yield, dividend-price ratio and payout ratio examined on the sample of sixteen Asian-Pacific and twentyone European stock markets, concluding that however high effect their application has, their ability to predict is fairly weak. Badruzaman and Kusmayadia (2017) deal with the correlation between the payout ratio and stock prices of publicly negotiable companies, finding a direct connection between both indicators on the Indonesian market. Ernayan et al. (2017) conducted multiple regression analysis of the investment return relating to the payout ratio in the same region, revealing a profound impact on the first indicator. Evaton and Paye (2017) compare the performance of predicting the investment return on shares and alternative incomes, considering the net payout income more precise than a traditional payout ratio.

In the last decades, utility companies ranked amongst the most stable institutes on financial markets relating to dividends. This situation, however, has been changing, regarding the pursuit of climatic objectives. In fact, environmental aspects are gaining in importance (Stefko et al., 2021). A large number of researchers have been focusing on the impact of strategically cutting emissions on financial results and dividend payouts. Balachadran and Nguen (2018) argue that what plays an essential role in fixing the dividend payout ratio is the amount of emitted carbon dioxide, at the same time lowering the value of the financial results, where polluters significantly reduce the ratio and create more extensive reserves. McLaughlin et al. (2019) indicate the same problem, considering regulatory measures a principal cause of system changes in funding utility corporations in Great Britain. Wu and Kung (2020) examine lower competitiveness of utility firms focused on emission-free technologies, calling for regulatory taxation on emission machinery.

Rose and Wei (2020) evaluate the economic impacts of the Property Assessed Clean Energy (PACE) in California, exploring ecological contributions and impacts of imposed measures in terms of increased risks for the involved. Barroco and Herrera (2019) present the paradox in state-promoted investments in renewable resources in the Philippines widely used by capitalized investors (utility companies), resulting in full ownership of the utility infrastructure rather than small investors sharing the property of renewable resources.

Innovations play an important role in economic life (Gavurova et al., 2021a; Gavurova et al., 2021b), and Lüdeke-Freund presents business models for sustainable innovations (BMfSI) for sustainable energetics. Liu et al. (2019) emphasize the influence of regulatory models and programme support systems on reducing emissions in individual countries, arguing that occasional costs of the loss of earnings are in direct conflict with long-term environmental goals. McNerney and Bunn (2019) analyse investments in renewable and low-carbon resources by classifying utility investors, suggesting other fiscal or tax measures to make this sector more attractive, so far considered by investors as strongly dependent on political-economic decisions.

Stede (2017) further confirms this fact by evaluating the effectiveness of stimulation-restrictive measures in Italy leading to an increase in utility and protection of the environment. He declares that there is no direct correlation between government or European encouragement and funding of utility or distribution companies. Gallego-Alvarez et al. (2017) prove by linear-regression models that corporations gradually devise their strategies to be more compatible, showing social and institutional characteristics.

Li et al. (2019) reveal indirect correlation through political resources in Chinese utility enterprises, demonstrating that the stronger the political relations are, the closer the connections between political contacts and corporate performance appear. Shi (2019) uses a model of investment expectations in utility organizations within the same region to measure excessive investments and free cash flow.

Nylund et al. (2019) focus on internal and external funding of utility companies, claiming that external financing in the form of increased debt burden discourages them from innovating. Lambrecht and Myers (2017) indicate a strong aversion to taking risks and security and limited use of a tax shield, capital accumulation and other negative influences on a dynamic model of a utility corporation, considering the corporate strategic management as the crucial factor. Von Eije et al. (2017) work on the theory of Lambrecht-Myers, demonstrating regional differences where Latin American companies adjust payout ratios faster than their US counterparts. Straehl and Ibbotson (2018) reveal a remarkable correlation between GNP growth and the total payout per share (cleaned by the decline in shares from buyback), arguing that the cyclically adjusted total yield (CATY) predicts a change in the expected income, as in the cyclically adjusted price-earnings ratio (CAPE). Ning and Sobel (2018) deal with the connection between the market volatility and dividend rates, maintaining that growing endogenous values of capacities and cash coincide with the increased insecurity of the development, to which companies respond by reducing payout ratios.

Biasin et al. (2019) point out an apparent paradox phenomenon of increasing the value in companies including the earning payout in the form of investments in programmes of corporate social responsibility in terms of reviewing the company performance discussing yields on model portfolios in the sample of 50 enterprises listed on stock markets. Hsu (2018) analyses the same area, claiming that CSR (Corporate Social Responsibility) presents a functional predictor for determining the company life-cycle and, apart from other, earning management. Amor-Esteban et al. (2020) examine the same sector in the area of energy companies on the example of Norsk Hydro Company, accurately assessing effects of imposed measures throughout the scope of entrepreneurship by an index of corporations using CUR matrix.

ČEZ Company provides a striking example of insider trading by an option programme for the top management available in the organization until 2019. Oded (2019) explores this area by presenting a reusable predictive model focusing on the influence of insider trading. He suggests using programmes implemented via the free market, warning about the risk of the excessively strong motivation of involved employees and related negative outcomes such as considerably low investment rates.

The dividend payout policy is a very complex issue leading to various theories explaining the payout ratio by different variables. The most frequently confirmed theories are the dividend payout ratio being dependent on the earning rate of the company, accepting the opinion that the company net income ranks amongst the main reasons to change dividends. We monitor this connection in the further steps of the specific enterprise, subsequently suggesting results for the whole segment.

3. Data and Methodology

To examine the relation between profitability and payout ratio, the data obtained in the last 11 years (between 2008 and 2018) from ČEZ was used. This Czech company is active in the generation of electrical energy. Its main activity is selling electricity and providing related services. The company is dependent on the prices of electricity. If the price decreases, the earning decreases as well. Further information is available on the ČEZ web sites.

Table 1 provides information on the individual years with selected data that affects the following analysis. The data is extracted from annual reports of the given period.

Table 1. Selected data of ČEZ company (2008-2018)

	Net profit after taxation (CZK million)	Dividends declared (CZK million)	Number of shares (millions of pieces)	Market price of share (in CZK/share)
2008	47,351	21,300.0	538	784.8
2009	51,855	26,700.0	538	864.0
2010	46,941	28,300.0	538	783.0
2011	40,753	26,700.0	538	786.0
2012	40,153	24,000.0	538	680.0
2013	35,207	21,400.0	538	517.0
2014	22,432	21,400.0	538	591.0
2015	20,547	21,400.0	538	444.3
2016	14,575	21,519.6	538	430.0
2017	18,959	17,753.7	538	496.5
2018	10,500	17,753.7	538	535.0

Source: Compiled by authors with data from www.cez.cz

Based on the data, an analysis of payout ratio will be carried out. According to Vochozka (2011), these are capital market indicators, which are of special importance for investors. This is supported by Růžicková (2019) claiming that these indicators are important for the following calculation, not only for the investors but also for the company itself. For the calculation of payout ratio (PR), further data is necessary, in particular the indicators of EPS and DPS. The definitions of these indicators have been modified and interpreted by the authors mentioned above.

EPS, which refers to earn per share, represents net profit per share. It is calculated as a net earning after taxation (Z) divided by the number of shares (qa). It thus indicates the earning per one share. The formula is as follows:

$$\text{EPS} = Z / qa \quad (1)$$

DPS (dividend per share) is another indicator. It represents a given dividend per one share. It is calculated as the company's declared dividends from net profit (D) divided by the number of shares (qa). The formula is as follows:

$$\text{DPS} = D / qa \quad (2)$$

The ratio of the above indicators EPS and DPS is used for the calculation of the payout ratio (PR) using the formula below. This indicator is expressed in percentage and indicates the percentage from the net earning that was divided between shareholders in the form of dividends:

$$PR = \frac{\frac{D}{qa}}{\frac{Z}{qa}} = \frac{D}{qa} \times \frac{Z}{qa} = \frac{DPS}{EPS} \quad (3)$$

Another calculation using payback ratio (PB) indicates the percentage reinvested back into a company. The calculation is carried out by subtracting the payout ratio 1:

$$PB = 1 - PR \quad (4)$$

PR and PB indicators are thus closely related, one of them expressing the share of earnings after taxation paid to shareholders, while the other expressing the share used for company's reinvestments. An important fact is that the sum of both indicators must be equal to 1:

$$PR + PB = 1 \quad (5)$$

Another important indicator is dividend cover (DC). This indicator shows how many times the dividend is covered by attributed earnings, thus indicating the use of the earnings for other purposes. The calculation of DC is very simple, as it refers to the inverse value of the indicator PR, i.e.:

$$DC = EPS / DPS \quad (6)$$

To determine the return on investment and its profitability, the ratio indicator ensures the price earnings ratio (P/E). Its value is determined by the ratio of two variables, market share price (Ta), which appears in the statements as the price of the share at the end of the year. This share price (Ta) is then divided by the aforementioned earnings per share (EPS):

$$P / E = Ta / EPS \quad (7)$$

The above formulas help to analyse the situation of share indicators in the company. This indicates the real situation of the company, that is, the share of the economic earnings (net profit) that is allocated to dividends and the share that is used for reinvestments in the company. Using these results, it is possible to obtain further information, e.g. on how the market perceives the prospects of the company on the basis of the earnings. The indicators also enable to determine the development of the dividend depending on the earnings for the recent years. The analysis results will be presented by means of a table and figures and interpreted subsequently. It is clear that a shareholder's view is not sufficient. It is necessary to connect the management, with the shareholders, who require the highest amount of dividends possible. Therefore, it is necessary to find the optimum. Using the results obtained, it needs to be assessed whether the company divides the payout ratio well or not on the basis of the earnings. There must not be loss on the side of the management nor on the other side – shareholders. For the proper evaluation of both parties, correlation analysis will be used.

Using correlation r it is possible to identify and prove the mutual dependence of two variables. According to Momber et al. (2017) it is so-called Pearson correlation coefficient, defined as a quotient of covariance (cov) and a product of standard deviations (σ):

$$r = \frac{\text{cov}(x,y)}{\sigma_x * \sigma_y} \quad (8)$$

In further detail:

$$r = \frac{\sum (x_i - \bar{x}) * (y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 * \sum (y_i - \bar{y})^2}} \quad (9)$$

It is an expression of the strength of the relationship between two variables, in this case, the retained earnings from the previous year and the earnings in the current year. The strength of the relationship can take values between – 1 and +1. The closer it is to one of the above values, the strong the linear correlation is.

It is generally acknowledged that there are various levels of the correlation strength, as Momber believes. Fu also mentions the levels of correlation with various values (Fu et al., 2020) When searching for these levels, it is necessary to divide the values of correlation and to determine its limit values. By connecting the limits determined by Momber et al. (2017) and Fu et al. (2020), four basic types of correlation level are achieved, which can be described verbally (see Table 2).

Table 2. Values of correlation “r”

Weak correlation	$r \leq 0.39$
Moderate correlation	$r = 0.40-0.69$
Strong correlation	$r = 0.70-0.90$
Very strong correlation	$r \geq 0.90$

Source: Authors

This analysis enables to assess the relationship between the retained earnings of the previous year and the earnings in the current year. In conclusion, it is possible to identify whether the ratio is adequate or not, and to propose changes a company in such a situation shall adopt. Considering the results of the correlation analysis, recommendations for the whole segment can be made, specifically the recommendation on how to determine the payout ratio in other companies.

4. Results and Discussion

In order to examine the relationship of the indicators, the analysis of a given company’s annual statements needs to be carried out. From the statements, the data for the years 2008-2019 will be extracted to analyse the effect on the payout ratio and others. Table 3 shows the calculated values of the ratio indicators in order to determine the overall situation of a company to analyse the payout ratio influenced by earnings.

Table 3. Ratio indicators

	EPS (CZK/share)	DPS (CZK/share)	PR (%)	PB (%)	DC (%)	P / E
2008	88.0	40	45.46	54.54	220.00	8.92
2009	96.4	50	51.87	48.13	192.80	8.96
2010	87.3	53	60.71	39.29	164.72	8.97
2011	75.7	50	66.05	33.95	151.40	10.38
2012	74.6	45	60.32	39.68	165.78	9.12
2013	65.4	40	61.16	38.84	163.50	7.91
2014	41.7	40	95.92	4.08	104.25	14.17
2015	38.2	40	104.71	-4.71	95.50	11.63
2016	27.1	40	147.60	-47.60	67.75	15.87
2017	35.2	33	93.75	6.25	106.67	14.11
2018	19.5	33	169.23	-69.23	59.09	27.44

Source: Authors

It follows from the table that EPS (earnings per share) decreases in the last years due to the decrease in the overall company earnings.

The development of the dividends paid as a function of earnings for the last 11 years seems to be stable, which is confirmed by the general evaluation of energy companies in terms of dividends as one of stable sectors (Romero, 2017).

However, there was a significant decrease in the last two years, which can be disturbing for investors. The payment of DPS in 2018 was CZK 33/share from the 2017 earnings, which is 169.23% of the profit per share, which was CZK 19.5. The situation was the same in 2016, when the profit per share was CZK 35.2. Figure 1 shows the declining trend of the dividends paid. The reason for this unfavourable development is the prices on the energy stock exchange. These are the prices of electricity ČEZ profitability depends on.

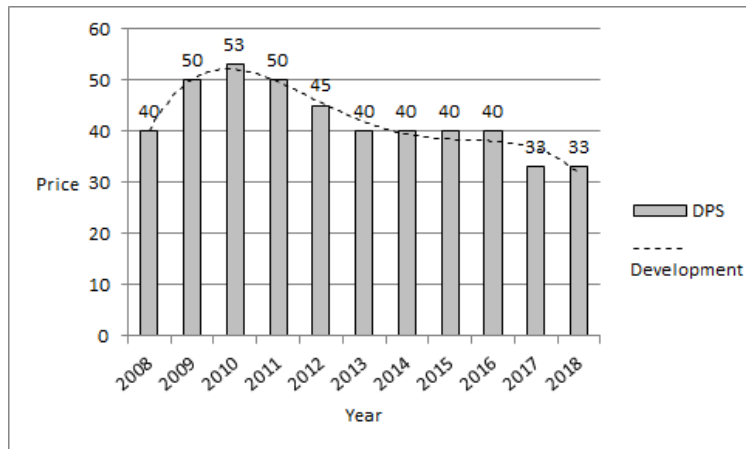


Figure 1. Development of ČEZ dividend (in CZK)

Source: Authors

A company's payout ratio (PR) is a method to measure the sustainability of the dividend flow. A lower ratio indicates sustaining more of its income for reinvestment and growth of the company, while a higher PR, in the

case of paying more than 100%, means paying the dividends exceeding the company's net income. The company thus draws from the retained earnings from the past years to pay out higher dividends. In recent years, ČEZ has been implementing a dividend policy, where the payout ratio has been temporarily expanded compared to the past years. This was also the reason for paying higher dividends to the investors and for the reduction of reinvestments in the company. This situation, when more money is paid than received does not seem to be sustainable in the long run, which is also evident from the correlation with the general trend, when energy companies in many European countries adapt their business models to the changes of the market conditions (Salm and Wüstenhagen, 2018). On the other hand, the company shows relatively low level of indebtedness and makes profit from advance sale of key commodities in the medium term. Another factor distinguishing ČEZ from the other companies operating in the energy market is a complex supply and demand vertical and relatively invested wide portfolio of production resources, where nuclear power plants play a major role. These appear to be a key price stabilization factor even to the value of the company's shares. According to Jiménez-Rodríguez (2019) in Europe, there is a clear relationship between the price of emission allowances and the price of large energy companies' shares, where emission-free resources significantly increase the value of the company.

On the basis of the monitored payback ratio (PB), it can be concluded that the reinvestments in the company have been reduced significantly in the last 5 years.

The company's prospects using the market price ratio indicator P/E can be formulated as positive. This indicator is influenced by share price and the profit. In the current monitored situation, the P/E value rises. Generally, it is believed that the higher the value of P/E indicator, the more positive the evaluation. However, in the last year, the value significantly exceeded 15. Why 15? In the case of investments, it is generally recommended to buy shares with the P/E lower than 15; it is a long-term average of the P/E index S&P 500. It means that on average, a company with this index has 15 times higher value to the profit per share. For example, in the initial year of the research (in 2008), the company had a P/E of 8.92. This means that the buyers are willing to pay almost 9 times higher price for a share than the yearly profit is. Furthermore, this value can be seen as a return on investment; in this case, the investment will return in less than 9 years.

In the current situation, when the world is dominated by chaos and panic from the spread of COVID-19, the development of the financial market seems unclear. Due to the declaration of the state of emergency in the Czech Republic on 12 March 2020, Prague Stock Market weakened. There was noted the biggest drop since the economic crisis in 2008. According to the Czech Press Agency (CPA), almost all issues of Prague Stock Exchange fell into the red. This applies also to the shares of the energy company ČEZ, which fell by 11.27% in one day. The price at the end of the previous day was CZK 420.40, while on the following day, on 12 March, it was CZK 373. Here can be seen a specific decrease by 11.27%. According to CPA, it has been the biggest decrease in ČEZ share prices in the last 4 years. Given the situation, the development of ČEZ share prices improves and starts to achieve the original values. However, it is premature to expect further positive development of the market, as the situation remains unclear.

Table 4 shows the relationship between the retained earnings of the previous year and the net profit in the current year. On the basis of the results achieved by means of correlation analysis, it can be determined whether an adequate payout ratio has or has not been set.

Table 4. Correlation analysis

Year	Net profit of current year (CZK million)	Retained earnings of previous year (CZK million)
2008	47,351	9.951
2009	51,855	20.458
2010	46,941	16.887
2011	40,753	7.836
2012	40,153	13.102
2013	35,207	13.790
2014	22,432	4.828
2015	20,547	0.609334
2016	14,575	6.595
2017	18,959	8.919
2018	10,500	12.648
Correlation coefficient = 0.607218		

Source: Authors

The purpose of the correlation analysis is to determine the relationship between the two variables. The values of the given earnings were used for the determination of the correlation coefficient by means of Pearson formula. The strength of the relationship (0.607218) can be considered adequate. It is a moderate correlation close to 1 and thus closer to stronger correlation. The positive linear correlation thus shows moderate to strong relationship between two variables. The positive value of 0.607218 indicates direct correlation, which means that the values of the second variable increase with the increase of the values of the first variable.

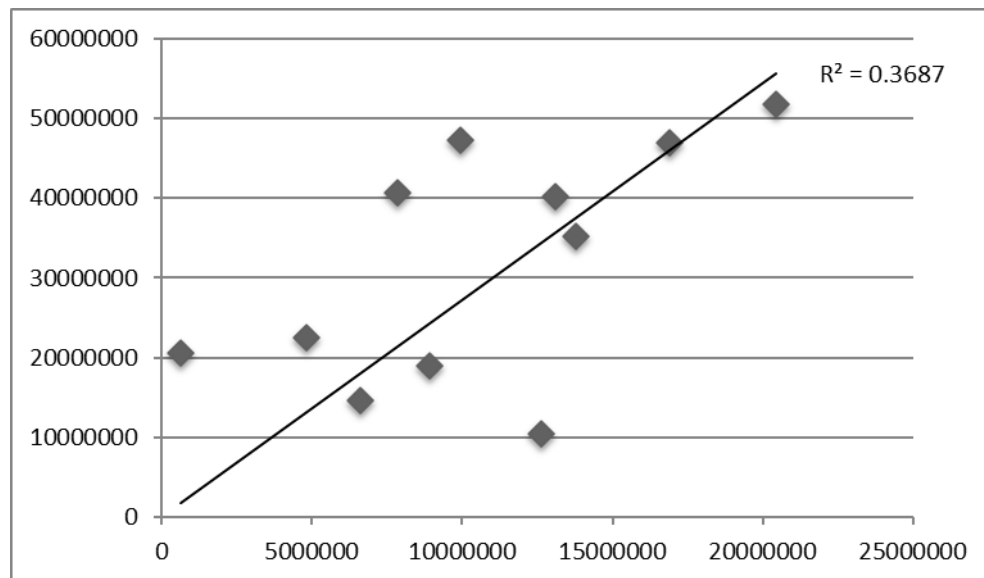


Figure 2. Positive correlation

Source: Authors

It follows from this research that profit influences the payout ratio in a positive way. If the profit increase, the correlation coefficient will get closer to 1 and thus to almost perfect correlation. This means that the closer the relationship between the two given variables, the closer the coefficient is to 1. The positive correlation is shown in Figure 2.

Conclusions

ČEZ is the biggest player in the market, with good economic results, stable, expanding to Europe. Czech market is open and anyone can choose; it can be said that this company is a leader in its segment. As all industries, the energy sector has also been affected by economic and financial crisis since 2008. However, its effect did not affect ČEZ significantly, since it showed high earnings even during this crisis. ČEZ owes its success to a good business policy. It sells a substantial part of its electricity production to trading companies for 2 years in advance. The permanently good economic results allow ČEZ to improve its dividend policy. Compared to previous years, when the payout ratio was 50-60%, the company has reached a new payout limit since 2017, which was 60-100% of the net profit. According to ČEZ's semi-annual report, a further adjustment of the payout ratio is planned for 2019. The adjustment will consist in increasing the lower limit of the payout ratio interval, the new ratio reaching 80-100% of the net profit. The main reason is the change in the strategy of the business concept and the assumption of the non-existence of the investments in renewable resources abroad. After five years of a steady economic decline, a radical change is expected for the year 2019. Thanks to better financial results and prospects for the future, better conditions for dividend payment are being created. The main reason for these results will be the rising prices of electricity the company ensures by pre-selling a part of electricity for 2 years in advance. ČEZ has and in the coming years will have better conditions for the payment of the 2019 dividend than it had in the period of 2016-2018. Thanks to pre-selling its product, even the COVID-19 crisis will not affect it significantly. Although the share prices fell to the minimum in the last 4 years during the declared state of emergency, they are currently rising back to their previous or even higher value.

The objective of this article was to analyse the development of payout ratio and its determination on the basis of the given development of the company's earnings. This objective was achieved. By means of examining the relationship of the given indicators and their subsequent analysis, the actual situation of the company, the distribution of a part of the earnings, and the prospects of the company in the market were identified on the basis of the earnings of the company. For a complex determination of whether the payout ratio is or is not adequate, correlation analysis was used, specifically, Pearson correlation coefficient, which ensured the adequate strength of the relationship, thus confirming its correct level. On this basis, it was possible to conclude that the profit has a positive effect on payout ratio. This applies to energy companies only. A prerequisite for the application of this model is the existence of the linear relationship and dependence of two variables, which refers to the profits in the given dividend policy in this case.

Adequate payout ratio requires the existence of the correlation coefficient close to 1 and a close relationship between the variables. This ensures that the values of one variable rise or decline depending on the other variable. In statistics, it is not possible to rely on one calculation only. For further determination of the payout ratio, other scientific and statistical methods can be used. Pearson correlation coefficient would be complemented by the confidence interval, which would provide the information on the variability of this estimate. This way it would be possible to further construct a confidence interval or test zero hypotheses. The sample data range should be sufficient in size for statistical methods. In addition to statistics, it is also necessary to include the knowledge of this issue in the resulting interpretation, so that it is possible to connect the results with the practical part of the context.

References

- Amor-Esteban, V., Galindo-Villardón, M., & García-Sánchez, I. (2020). Bias in composite indexes of CSR practice: An analysis of CUR matrix decomposition. *Corporate Social Responsibility and Environmental Management*, 27 (4), 1914–1936. <https://doi.org/10.1002/csr.1936>
- Anderson, W., Bhattacharyya, N., Morrill, C., & Roberts, H. (2020). Dividend payout and executive compensation: theory and evidence from New Zealand. *Accounting & Finance*, 60 (S1), 1007–1022. <https://doi.org/10.1111/acfi.12399>
- Ansem, E. (2009). Dividends and price momentum. *Journal of Banking and Finance*, 33 (3), 486–494. <https://doi.org/10.1016/j.jbankfin.2008.09.004>
- Bacik, R., Fedorko, R., Abbas, E. W., Rigelsky, M., Ivankova, V., & Obsatnikova, K. (2019). The impact of selected quality management attributes on the profitability of TOP hotels in the Visegrad group countries. *Polish Journal of Management Studies*, 19 (1), 46–58. <https://doi.org/10.17512/pjms.2019.19.1.04>
- Badruzaman, J., & Kusmayadia, D. (2017). Dividend payout ratio influence towards stock price. ASIA International Conference (AIC) on Emerging Issues in Economics and Finance (EIEF) and Future of Marketing and Management (FMM). Retrieved 14 October, 2021, from: <https://www.ingentaconnect.com/content/asp/asl/2017/00000023/00000009/art00146;jsessionid=1n655o4cfclsi.x-ic-live-01>
- Balachandran, B., & Nguyen, J. (2018). Does carbon risk matter in firm dividend policy? Evidence from a quasi-natural experiment in an imputation environment. *Journal of Banking & Finance*, 96, 249–267. <https://doi.org/10.1016/j.jbankfin.2018.09.015>
- Balachandran, B., Khan, A., Mather, P., & Theobald, M. (2019). Insider ownership and dividend policy in an imputation tax environment. *Journal of Corporate Finance*, 54, 153–167. <https://doi.org/10.1016/j.jbankfin.2018.09.015>
- Barroco, J., & Herrera, M. (2019). Clearing barriers to project finance for renewable energy in developing countries: A Philippines case study. *Energy Policy*. <https://doi.org/10.1016/j.enpol.2019.111008>
- Barth, A., Moreno-Bromberg, S., & Reichmann, O. (2016). A Non-stationary model of dividend distribution in a stochastic interest-rate setting. *Computational Economics*, 47 (3), 447–472. <https://doi.org/10.1007/s10614-015-9502-y>
- Benartzi, S., Michaely, R., & Thaler, R. (1997). Do changes in dividends signal the future or the past? *Journal of Finance*, 52, 1007–1034. <https://doi.org/10.1111/j.1540-6261.1997.tb02723.x>
- Biasin, M., Cerqueti, R., Giacomini, E., Marinelli, N., Quaranta, A. G., & Riccetti, L. (2019). Macro asset allocation with social impact investments. *Sustainability*, 11 (11). <https://doi.org/10.3390/su11113140>
- Bond, S. A., Pai, Y., Wang, P., & Zheng, S. (2019). The impact of dividend reinvestment plans on firm payout choices-evidence from real estate investment trusts. *Real Estate Economics*, 47 (1), 178–213. <https://doi.org/10.1111/1540-6229.12248>
- Caha, Z. (2017). Exploitation of external financial resources for corporate training purposes in the Czech Republic. *Littera Scripta*, 10 (1), 10–21. Retrieved October 13, 2021, from: <https://littera-scripta.com/exploitation-of-external-financial-resources-for-corporate-training-purposes-in-the-czech-republic/>
- Charles, A., Darné, O., & Kim, J. H. (2017). International stock return predictability: evidence from new statistical tests. 5th International Conference of the Financial-Engineering-and-Banking-Society. Retrieved 14 October, 2021, from: <https://www.sciencedirect.com/science/article/abs/pii/S1057521916300904?via%3Dihub>
- Dragota, V., Pele, D. T., & Yaseen, H. (2019). Dividend payout ratio follows a Tweedie distribution: International evidence. *Economics E-Journal*, 13. <https://doi.org/10.5018/economics-ejournal.ja.2019-45>
- Dvorsky, J., Belas, J., Gavurova, B., & Brabenec, T. (2021) Business risk management in the context of small and medium-sized enterprises. *Economic Research-Ekonomska Istraživanja*, 34 (1), 1690–1708. <https://doi.org/10.1080/1331677X.2020.1844588>
- Eaton, G., & Paye, S. (2017). Payout yields and stock return predictability: how important is the measure of cash flow? *Journal of Financial and Quantitative Analysis*, 52 (4), 1639–1666. <https://doi.org/10.1017/S0022109017000370>

- Ernayani, R., Sari, O., & Robiyanto, R. (2017). The effect of return on investment, cash ratio, and debt to total assets towards dividend payout ratio (A study towards manufacturing companies listed in Indonesia stock exchange). 2nd International Research Conference on Business and Economics (IRCBE). Retrieved 14 October, 2021, from: <https://www.ingentaconnect.com/content/asp/asl/2017/00000023/00000008/art00047>
- Fama, E. F., & French, K. R. (2001). Disappearing dividends: changing firm characteristics or lower propensity to pay? *Journal of Financial Economics*, 60 (1), 3–43. <https://doi.org/10.7208/9780226426983-030>
- Farooq, O., (2019). Aktaruzzaman, K. Financial centers and dividend policy: evidence from an emerging market. *Management Decision*, 58 (6). <https://doi.org/10.1108/MD-12-2017-1230>
- Fidrmuc, J. P., & Jacob, M. (2010). Culture, agency cost and dividends. *Journal of Comparative Economics*, 38 (3), 321–339. <https://doi.org/10.1016/j.jce.2010.04.002>
- Floyd, N., Li, S., & Douglas, J. (2015). Payout policy through the financial crisis: the growth of repurchases and the resilience of dividends. *Journal of Financial Economics*, 118 (2), 299–316. <https://doi.org/10.1016/j.jfineco.2015.08.002>
- Fu, T., Tang, X. B., Cai, Z. K., Zuo, Y., Tang, Y. M., & Zhao, X. H. (2020). Correlation research of phase angle variation and coating performance by means of Pearson's correlation coefficient. *Progress in Organic Coatings*, 139. <https://doi.org/10.1016/j.porgcoat.2019.105459>
- Gallego-Alvarez, I., Ortas, E., Vicente-Villardón, J., & Álvarez Etxeberria, I. (2017). Institutional constraints, stakeholder pressure and corporate environmental reporting policies. *Business Strategy and the Environment*, 26 (6), 807–825. <https://doi.org/10.1002/bse.1952>
- Gavurova, B., Belas, J., Zvarikova, K., Rigelsky, M., & Ivankova, V. (2021a). The effect of education and R&D on tourism spending in OECD countries: An empirical study. *Amfiteatru Economic*, 23 (58), 806–823. <https://doi.org/10.24818/EA/2021/58/806>
- Gavurova, B., Belas, J., Valaskova, K., Rigelsky, M., & Ivankova, V. (2021b). Relations between infrastructure innovations and tourism spending in developed countries: A macroeconomic perspective. *Technological and Economic Development of Economy*, 27 (5), 1072–1094. <https://doi.org/10.3846/tede.2021.15361>
- Georgen, M., Silva, L., & Renneboog, L. (2005). When do German firms change their dividends? *Journal of Corporate Finance*, 11 (2), 375–399. <https://doi.org/10.1016/j.jcorpfin.2003.09.001>
- Geyer-Klingenberg, J., Hang, M., & Rathgeber, A. W. (2019). What drives financial hedging? A meta-regression analysis of corporate hedging determinants. Symposium on Meta-Analysis and Systematic Reviews in International Finance. Retrieved 14 October, 2021, from: <https://www.sciencedirect.com/science/article/abs/pii/S1057521918300681?via%3Dihub>
- Gill, A., Biger, N., & Tirbewala, R. (2010). Determinants of dividend payout ratios: evidence from United States. *The Open Business Journal*, 3, 8–14. <https://doi.org/10.2174/1874915101003010008>
- Grullon, G., Michaely, R., & Swaminathan, B. (2002). Are dividend changes a sign of firm maturity? *Journal of Business*, 75, 387–424. <https://doi.org/10.1086/339889>
- Havlíček, D., & Stupavský, M. (2013). *Investor 21 století [21st century investor]*. Prague: Plot.
- Herwartz, H., Rengel, M., & Xu, F. (2016). Local trends in price-to-dividend ratios-assessment, predictive value, and determinants. *Journal of Money, Credit and Banking*, 48 (8), 1655–1690. <https://doi.org/10.1111/jmcb.12370>
- Hsu, F. J. (2018). Does corporate social responsibility extend firm life-cycles? *Management Decision*, 56 (11), 2408–2436. <https://doi.org/10.1108/MD-09-2017-0865>
- Huang, X., & Zheng, J. (2017). Research into the impact of analysts forecasts on management earnings forecasts - evidence from China. *Littera Scripta*, 10 (1), 35–49. Retrieved October 13, 2021, from: <https://littera-scripta.com/research-into-the-impact-of-analysts-forecasts-on-management-earnings-forecasts-evidence-from-china/>
- Iovino, F., & Migliaccio, G. (2019). Energy companies and sizes: an opportunity? Some empirical evidences. *Energy Policy*, 128, 431–439. <https://doi.org/10.1016/j.enpol.2019.01.027>

- Jiang, F., Ma, Y., & Shi, B. (2017). Stock liquidity and dividend payouts. *Journal of Corporate Finance*, 42, 295–314. <https://doi.org/10.1016/j.jcorpfin.2016.12.005>
- Jiménez-Rodríguez, R. (2019). What happens to the relationship between EU allowances prices and stock market indices in Europe? *Energy Economics*, 81, 13–24. <https://doi.org/10.1016/j.eneco.2019.03.002>
- Kahle, K. M., & Stulz, R. M. (2017). Is the US public corporation in trouble? *Journal of Economic Perspectives*, 31 (3), 67–88. <https://doi.org/10.1257/jep.31.3.67>
- Kelemen, M., Polishchuk, V., Gavurova, B., Rozenberg, R., Bartok, J., Gaál, L., Gera, M., & Kelemen, M., Jr. 2021. Model of evaluation and selection of expert group members for smart cities, green transportation and mobility: from safe times to pandemic times. *Mathematics*, 9, 1287. <https://doi.org/10.3390/math9111287>
- Kim, W., Sung, T., & Wei, S. (2017). The diffusion of corporate governance to emerging markets: evaluating two dimensions of investor heterogeneity. *Journal of International Money and Finance*, 70, 406–432. <https://doi.org/10.1016/j.jimonfin.2016.10.002>
- Kohout, P. (2014). *Investiční strategie pro třetí tisíciletí [Investment strategies for the third millennium]*. Prague: Grada.
- Koussis, N., & Makrominas, M. (2019). What factors determine dividend smoothing by US and EU banks? *Journal of Business Finance & Accounting*, 46 (7–8), 1030–1059. <https://doi.org/10.1111/jbfa.12399>
- Lambrecht, B. M., & Myers, M. S. (2017). The dynamics of investment, payout and debt. *The Review of Financial Studies*, 30 (11), 3759–3800. <https://doi.org/10.1093/rfs/hhx081>
- Li, M., Sun, X., Wang, Y., & Song-Turner, H. (2019). The impact of political connections on the efficiency of China's renewable energy firms. *Energy Economics*, 83, 467–474. <https://doi.org/10.1016/j.eneco.2019.06.014>
- Mcinerney, C., & Bunn, D. W. (2019). Expansion of the investor base for the energy transition. *Energy Policy*, 129, 1240–1244. <https://doi.org/10.1016/j.enpol.2019.03.035>
- Liu, J., Zhang, L., Cai, J., & Davenport, J. (2019). Legal systems, national governance and renewable energy investment: evidence from around the world. *British Journal of Management*, 32 (3), 1467–8551. <https://doi.org/10.1111/1467-8551.12377>
- McLaughlin, C., Elamer, A. A., Glen, T., Alhares, A., & Gaber, A. (2019). Accounting society's acceptability of carbon taxes: Expectations and reality. *Energy Policy*, 131, 302–311. <https://doi.org/10.1016/j.enpol.2019.05.008>
- Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth and the valuation of share. *Journal of Business*, 34 (4), 411–433. Retrieved 14 October, 2021, from: <https://www.jstor.org/stable/2351143>
- Momber, A. W. S., Buchbach, P., Plagemenn, T., & Marquardt, T. (2017). Edge coverage of organic coatings and corrosion protection over edges under simulated ballast water tank conditions. *Progress in Organic Coatings*, 108, 90–92. <https://doi.org/10.1016/j.porgcoat.2017.03.016>
- Mun, S. G., & Jang, S. (2019). Indicating restaurant firms' financial constraints: a new composite index. *International Journal of Contemporary Hospitality Management*, 31 (4), 2014–2031. <https://doi.org/10.1108/IJCHM-06-2018-0466>
- Ning, J., & Sobel, M. J. (2018). Production and capacity management with internal financing. *Manufacturing & Service Operations Management*, 20 (1), 147–160. <https://doi.org/10.1287/msom.2017.0655>
- Nylund, P. A., Arimany-Serrat, N., Ferras-Hernandez, X., Viardot, E., Boateng, H., & Brem, A. (2019). Internal and external financing of innovation sectoral differences in a longitudinal study of European firms. *European Journal of Innovation Management*, 23 (2), 200–213. <https://doi.org/10.1108/EJIM-09-2018-0207>
- Oded, J. (2019). Payout policy, financial flexibility, and agency costs of free cash flow. *Journal of Business Finance & Accounting*, 47 (1–2), 218–252. <https://doi.org/10.1111/jbfa.12407>
- Polishchuk, V., Kelemen, M., & Kozuba, J. 2019. Technology improving safety of crowdfunding platforms functioning in the context of the protection of the start-up investors in the financial and transport sectors. *Journal of KONBiN*, 49 (1), 313–330. <https://doi.org/10.2478/jok-2019-0016>

Rejnuš, O. (2014). Finanční trhy [Financial markets]. Prague: Grada.

Romero, F. P. (2017). How the rivals reacted? An empirical analysis on the impact of dividend announcements on the rival firms' stock valuation. 2nd International Research Conference on Business and Economics (IRCBE). Retrieved 14 October, 2021, from: <https://www.ingentaconnect.com/content/asp/asl/2017/00000023/00000008/art00146>

Rose, A., & Wei, D. (2020). Impacts of the Property Assessed Clean Energy (PACE) program on the economy of California. *Energy Policy*, 137. <https://doi.org/10.1016/j.enpol.2019.111087>

Růžicková, P. (2019). *Finanční analýza. Metody, ukazatele, využití v praxi [Financial analysis. Methods, indicators, use in practice]*. Prague: Grada Publishing.

Rybáček, V. (2018). The size of government in empirical research: a case study from the Czech Republic. *Littera Scripta*, 11 (2), 141–154. Retrieved October 13, 2021, from: <https://littera-scripta.com/the-size-of-government-in-empirical-research-a-case-study-from-the-czech-republic/>

Salm, S., & Wüstenhagen, R. (2018). Dream team or strange bedfellows? Complementarities and differences between incumbent energy companies and institutional investors in Swiss hydropower. *Energy Policy*, 121, 476–487. <https://doi.org/10.1016/j.enpol.2018.04.046>

Shi, M. (2019). Overinvestment and corporate governance in energy listed companies: evidence from China. *Finance Research Letters*, 30, 436–445. <https://doi.org/10.1016/j.frl.2019.05.017>

Stede, J. (2017). Bridging the industrial energy efficiency gap – Assessing the evidence from the Italian white certificate scheme. *Energy Policy*, 104, 112–123. <https://doi.org/10.1016/j.enpol.2017.01.031>

Stefko, R., Gavurova, B., Kelemen, M., Rigelsky, M., & Ivankova, V. (2021). Relationships between renewable energy and the prevalence of morbidity in the countries of the European Union: A panel regression approach. *International Journal of Environmental Research and Public Health*, 18 (12), 6548. <https://doi.org/10.3390/ijerph18126548>

Straehl, P. U., & Ibbotson, R. B. (2018). The long-run drivers of stock returns: total payouts and the real economy. *Financial Analysts Journal*, 73 (3), 32–52. <https://doi.org/10.2469/faj.v73.n3.4>

Šuleř, P., Horák, J., & Krulický, T. (2020). Validation of the prediction of ČEZ stock prices. *Littera Scripta*, 13 (1), 194–210. https://doi.org/10.36708/Littera_Scripta2020/1/13

Tan, S., Jin, Z., & Yin, G. (2018). Optimal dividend payment strategies with debt constraint in a hybrid regime-switching jump–diffusion model. *Nonlinear Analysis: Hybrid Systems*, 27, 141–156. <http://doi.org/10.1016/j.nahs.2017.08.007>

Tran, Q. T. (2020). Foreign ownership and investment efficiency: new evidence from an emerging market. *International Journal of Emerging Markets*, 15 (6), 1185–1199. <https://doi.org/10.1108/IJOEM-07-2019-0573>

Vlachý, J. (2018). Applying the options framework to a value-based model of the firm. *Littera Scripta*, 11 (2), 69–79. Retrieved October 13, 2021, from: <https://littera-scripta.com/applying-the-options-framework-to-a-value-based-model-of-the-firm/>

Vochozka, M. (2011). *Metody komplexního hodnocení podniku [Methods of comprehensive evaluation of the company]*. Prague: Grada Publishing.

Vonejše, H., Goyal, K., & Muckley, C. B. (2017). Flexible firm-level dividends in Latin America. *Finance Research Letters*, 23, 133–136. <https://doi.org/10.1016/j.frl.2017.02.012>

Wu, T., & Kung, Ch. (2020). Carbon emissions, technology upgradation and financing risk of the green supply chain competition. *Technological Forecasting and Social Change*, 152. <https://doi.org/10.1016/j.techfore.2019.119884>

Ye, D., Deng, J., Liu, Y., Szweczyk, S., & Chen, X. (2019). Does board gender diversity increase dividend payouts? Analysis of global evidence. *Journal of Corporate Finance*, 58, 1–26. <https://doi.org/10.1016/j.jcorpfin.2019.04.002>

Zainudin, R., Mahdzan, N. S., & Yet, Ch. H. (2018). Dividend policy and stock price volatility of industrial products firms in Malaysia. *International Journal of Emerging Markets*, 13 (1), 203–217. <https://doi.org/10.1108/IJoEM-09-2016-0250>

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LAFFER CURVE – A COMPARATIVE STUDY ACROSS THE V4 (VISEGRAD) COUNTRIES*

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Abstract. The essence of the Laffer curve is simple - it represents the relationship between the tax rate imposed by a government and the tax revenues. Tax revenues are the product of the tax rate and the tax base. For this article and based on the theory that underpins the Laffer curve, the application thereof is generalized, and the economic growth rate adopted instead of tax revenues. The purpose of this article is, on the basis of the theory that underpins the Laffer curve, to determine the optimal tax rate in the V4 countries and to compare the results across these countries. Data on the GDP growth rates and tax rates in the Visegrad countries (V4 countries) for the period 1995-2017 are collated and the regression method applied to them to determine the suitable parameter values. For this study, the V4 countries are looked at as a whole. According to the conclusion drawn, it can be stated that the relationship between the GDP growth rate and the tax rate is significant for the V4 countries, and that the parameters of the regression equations conform to the expected symbols. This implies that the Laffer curve conforms with the overall situation in the V4 countries. Further analysis of the optimal tax rate and the situation in each country showed that Poland and the Slovak Republic have the more appropriate tax rates, whereas the Czech Republic and Hungary need to appropriately adjust their tax rates.

Keywords: Laffer curve; Visegrad countries; tax revenues; GDP growth

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JEL Classifications: E00, H71, O1

1. Introduction

The formulation of tax policy is a test of political wisdom, whereby tax policy is often the beginning of a dramatic political debate. In general elections across western countries, tax reduction policies are often used as an important tool with which to win elections (Kubátová, 2013). Tax revenues can have a large impact on an

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economy. An excessive tax burden can hinder economic growth and even increase social conflict (Novák et al., 2016). However, it is undeniable that taxes are indispensable in modern civilized countries and a cost society must pay (Rybáček, 2018). Since the introduction of the Laffer curve, the idea that increases in average tax rates lead first to an increase and then to a decrease in tax yields has played a significant role in the popular discussion about the size of the public sector (Patrick et al., 2013).

The purpose of this article is, on the basis of the theory that underpins the Laffer curve, to determine the optimal tax rate in the V4 countries and to compare the results across these countries. To this end, the application of the Laffer curve is generalized, and the economic growth rate adopted instead of tax revenues. Within this context, data on the tax rates and economic growth rates in the four countries for the period 1995-2017 were collated, the Laffer curve constructed and described for each country and the tax policies in the four countries subsequently compared. The economy of the V4 countries has been discussed by many authors in the past (Bacik et al., 2019; Gavurova et al., 2020; Bilan et al. 2017). For example, Šuleř and Machová (2020) focused on the financial situation of companies operating on the V4 markets and on predicting the further development of their financial situation.

2. Literature Review

A. Laffer presented the Laffer curve for the first time in an article published in 1978 (Wanniski, 1978). The essence of the Laffer curve is simple - it represents the relationship between the tax rate imposed by a government and the tax revenues. Tax revenues are the product of the tax rate and the tax base. A common argument for the shape of the Laffer curve runs as follows. If the tax rate is zero, tax revenues from that tax are also zero. However, if the tax rate is 100%, the tax revenues are also zero because no rational agent would generate a tax base for a 100% tax. It follows, that between these extremes, as the tax rate increases from zero to 100%, tax revenues will first increase, reach a maximum, and finally decrease (Trabandt and Uhlig, 2011). In an economy with a single tax, this implies that increasing the tax rate to increase tax revenues delivers diminishing returns and must eventually lead to a fall in tax revenues (Colombatto, 2015).

The Laffer curve has been used as the basis for a number of economic studies. Nutahara (2015) investigated the Laffer curve for Japan based on a neoclassical growth model. He found that while the labor tax rate is smaller than that at the peak of the Laffer curve, the capital tax rate is either very close to, or larger than, that at the peak of the Laffer curve. He also found that to maximize total tax revenues, the government should increase the labor tax rate, but decrease the capital tax rate. Miravete et al. (2018) studied commodity taxation and characterize the Laffer curve, a trade-off between tax rates and revenues, in non-competitive markets. They found that the strategic response of non-competitive firms to changes in taxation flattened the Laffer curve significantly. Dahlby and Ferede (2018) estimated tax base elasticities for Canadian provinces in order to compute the Marginal Cost of Public Funds (MCF) for three major taxes and to assess the revenue implications of tax rate changes. They found that in general, the corporate income tax has the highest and the sales tax the lowest MCF, and that four provinces were on the negatively sloped sections of their total revenues Laffer curves with respect to their corporate income tax rate. Bosi and Desmarchelier (2017) studied the relationship between the Laffer curve and the green paradox in the context of a Ramsey model with endogenous labor supply in which pollution increases consumer demand (through a compensation effect). They found that in the long run the conditions under which a Laffer curve and a green paradox emerge are mutually exclusive. Varela-Candamio and Morollon (2017) contrasted the Laffer hypothesis for the Spanish case under different spatial scenarios using microdata for 2009 provided by the country's Institute for Fiscal Studies. They employed a cross-sectional sample of tax filers, estimated by means of least squares. They found justification for the existence of a high level of fiscal decentralization. Arbel et al. (2019) constructed Laffer curves to evaluate the efficiency of local property tax collection based on a micro-level panel dataset for 2013-2016 obtained from the municipality of Jerusalem. Steinmüller et al. (2019) conducted a survey on corporate taxes around the world, using tax data from a large sample of countries to construct Laffer

curves in order to study effective tax measures. Feve et al. (2018) describe the Laffer curve for public debt as S-shaped and give an explanation as to why. It is clear from these and many other studies that the Laffer curve is a common method for studying the tax economy.

Tax revenues are closely linked to many factors, including economic growth, social stability and citizens' welfare, as well as have a great impact on individuals' incomes and decision-making behavior (Alavuotunki et al., 2019; Klieštík et al., 2018). For governments, tax revenues are an important source of revenue (Andreoni, 2019; Balcerzak et al., 2017). At the micro level, tax revenues affect everyone's daily lives, thereby affecting the choices and decisions people make with regards to job choice, employment, savings, education, consumption and even retirement (Marečková, 2013; Čihovská and Hudec, 2018). At the macro level, tax revenues have a significant impact on economic development, investment structure, resource allocation and the social services industry (Bilicka, 2019; Popílková and Raušer, 2018). Tax policies can reflect national cultures and social values (Toossi and Zhang, 2019). Kabourková and Popílková (2017) examined the effect of the number of children on tax credit rebates from taxpayers' income tax. According to the achieved results, it was found that the largest tax credit rebates from taxpayers' income tax are achieved with a monthly gross salary of 600 EUR. As the taxpayer's gross wage increases, the effect of this tax credit decreases, which in turn increases the state's tax revenues. Many experts have conducted studies into tax revenues from varying points of view. Szigeti et al. (2019) analyzed the revenue mix of the Hungarian health insurance fund for the period 1994-2015 and discussed the policy implications of their findings. Liesegang and Runkel (2019) explicitly modeled multinational enterprises and a corporate tax system designed according to formula apportionment, which contributed to literature on fiscal equalization and corporate tax competition. Kabourková and Rousek (2010) describe the historical development of the tax system of the Czech Republic and compare this development with the currently applicable tax rates. Mao and Wu (2018) applied the propensity score matching method and the difference-in-differences design to empirically examine the impact of the government-mandated adoption of international financial reporting standards on a country's income tax revenues. Mourre and Reut (2019) assessed the size, composition and volatility of non-tax revenues in the European Union, and explored, by means of panel data analysis, whether macroeconomic and fiscal conditions can explain the observed heterogeneity in non-tax revenues across the member states. They found that the relative variability of non-tax revenues was around three times higher than that of tax revenues, thereby posing a significant source of fiscal risk that is often overlooked. Examination of fiscal conditions for self-government (municipality management) from the time of stability to the pandemic, and in the framework of strengthening investor protection can be found in the work Kelemen et al. (2021), and Polishchuk et al. (2019).

To estimate the effect of exchange rate volatility on tax revenues, Ofori et al. (2018) employed the Auto Regressive Distributed Lag (ARDL) technique after the yearly exchange rate volatilities had been generated using the GARCH (1,1) method. The results of their study suggested that exchange rate volatility had a deleterious effect on tax revenues both in the short-run and long-run, but that the effect was more pronounced in the long-run than the short-run. Langer and Korzhenevych (2018) estimated the effect of changes in the built-up industrial and commercial area on business tax revenues through cross-sectional instrumental variable estimations. Based on detailed data for Bavaria, they found that an increase in the municipal built-up industrial and commercial area would have a significant and positive tax-revenue effect.

The tax rate is the ratio at which a business or person is taxed. Tax rates are usually expressed as a percentage (Tennant and Tracey, 2019) and are an important factor affecting tax revenues (Chernick and Reimers, 2019). The ambition of most governments is to achieve a proactive fiscal policy through the reduction of tax rates. This does not necessarily imply that tax revenues will decrease accordingly (Gius, 2018). As a result, many experts conduct research into tax rates. Rousek and Králová (2010) performed an analysis of fiscal policy from the perspective of the revenue side. Taxes are a key item of revenue in the fiscal budget. There is differentiation between tax and non-tax revenues of the state. Wang et al. (2019) analyzed data about cigarette tax compliance from the first US-

based national collection of littered cigarette packs. They provided evidence that non-compliance was due to both cross-border shopping and cigarette trafficking. They proved that tax avoidance is linked to the distance to lower-tax borders. Annuar et al. (2018) analyzed time series data for the period 1996-2014 using the autoregressive distributed lag approach in order to investigate the impact of the reduction of the corporate tax rate on corporate tax revenues. They found that the corporate tax rate had a dual effect on corporate tax revenues over the study period. Parchet (2019) exploited the fact that jurisdictions located close to a state border have neighbors in another state and created an instrument for comparing the tax rate of neighboring jurisdictions with the state-level tax rate of the neighboring state. He used this instrument to identify how strategic personal income taxes were set by local jurisdictions in Switzerland and found that tax rates were strategic substitutes. Using new narrative measures for exogenous variation in marginal tax rates associated with postwar tax reforms in the United States, Mertens and Olea (2018) estimated that the short-term tax elasticities of reported income were around 1.2 based on time series for the period 1946-2012. Matikka (2018) used Finnish data to analyze the elasticity of taxable income and used changes in flat municipal income tax rates as an instrument for overall changes in marginal tax rates. It is clear that the tax rate is directly relative to tax revenues, which is important research finding.

3. Data and Methodology

The GDP growth rates and tax rates for the V4 countries (Czech Republic, Slovak Republic, Poland and Hungary) were collated for the period 1995-2017, as sourced from World Bank, Trading Economics. The development of GDP growth rates (Figures 1) and tax rates (Figure 2) in the V4 countries are presented below.

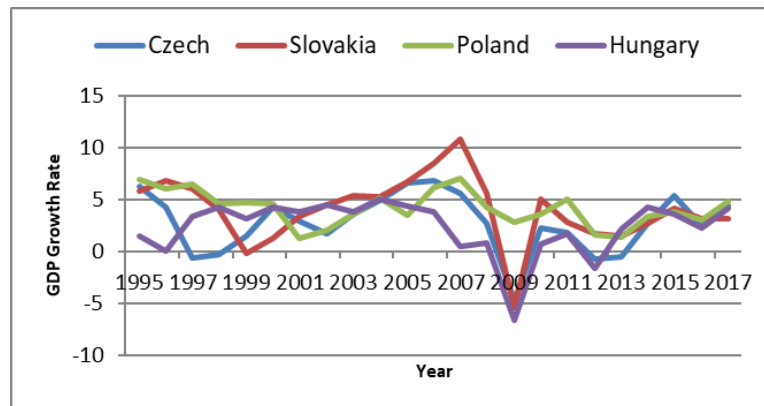


Figure 1. Development of GDP growth rates in V4 countries (1995-2017)

Source: Authors compiled

In Figure 1, it is evident that the GDP growth rate in the V4 countries fluctuated between 10% and -5%, reaching its lowest level in 2009. In Figure 2, it is evident that the tax rates in three of the V4 countries showed a downward trend, the exception being Hungary, which maintained a higher tax rate throughout the analyzed period. The country with the lowest taxes during the same period was the Slovak Republic. The relationship between the GDP growth rate and the tax rate across the V4 countries is presented in Figure 3.

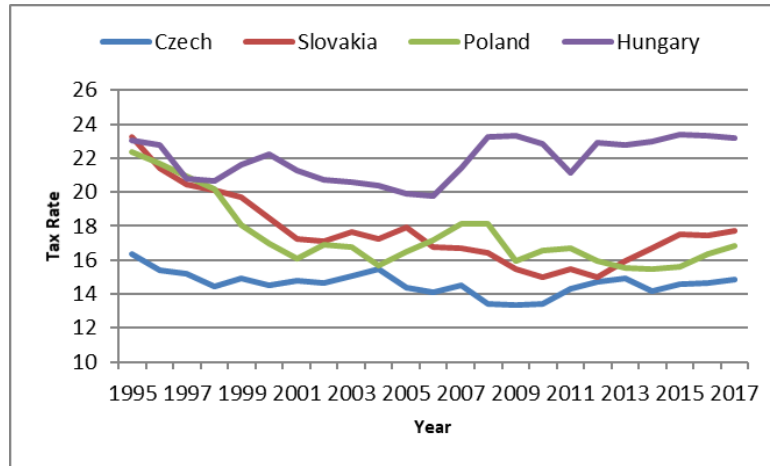


Figure 2. Development of tax rates in V4 countries (1995-2017)

Source: Authors compiled

In Figure 3, each point represents the GDP growth rate or tax rate of one of the V4 countries for the period 1995-2017. Intuitively, higher tax rates tend to be associated with lower GDP growth rates.

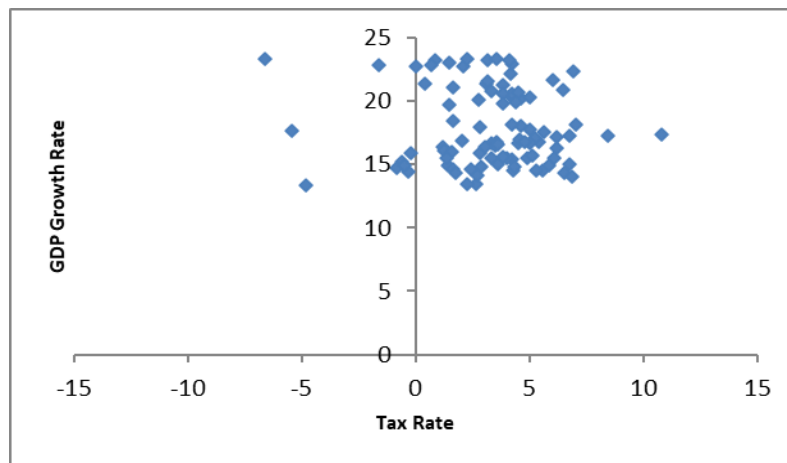


Figure 3. GDP growth rate and tax rate in V4 countries

Source: Authors compiled

The tax revenue and tax rate data for the V4 countries are listed in Table 1.

Table 1. Dataset of tax revenues and tax rates

Year	Czech Republic		Slovak Republic		Poland		Hungary	
	GDP growth rate (%)	Tax rate (%)	GDP growth rate (%)	Tax rate (%)	GDP growth rate (%)	Tax rate (%)	GDP growth rate (%)	Tax rate (%)
1995	6.221406	16.3390	5.843495	23.2554	6.951857	22.3936	1.489525	23.0570
1996	4.222815	15.3878	6.757147	21.4200	6.05658	21.6882	0.014155	22.7908
1997	-0.59466	15.1793	6.067543	20.4227	6.45955	20.9363	3.340164	20.7960
1998	-0.32872	14.4357	4.011814	20.1088	4.614648	20.1871	4.235848	20.6349
1999	1.432839	14.9401	-0.20507	19.6979	4.642211	18.0976	3.186896	21.6023
2000	4.266741	14.5169	1.210173	18.4666	4.559571	16.9937	4.20918	22.1991
2001	2.908765	14.8035	3.316468	17.2345	1.248005	16.0883	3.84051	21.2623
2002	1.652494	14.6155	4.522792	17.0747	2.041604	16.8739	4.528206	20.7452
2003	3.602989	15.0555	5.418716	17.6392	3.562472	16.7454	3.84862	20.6104
2004	4.906564	15.4908	5.258836	17.2455	5.13565	15.7017	5.004918	20.3621
2005	6.533469	14.3654	6.750961	17.9607	3.493659	16.5170	4.388215	19.9109
2006	6.853522	14.0829	8.452888	16.7546	6.179604	17.1859	3.851173	19.7817
2007	5.602644	14.5023	10.79958	16.7158	7.034802	18.1252	0.434762	21.3895
2008	2.682283	13.4418	5.629779	16.4063	4.249711	18.1635	0.855513	23.2500
2009	-4.80257	13.3608	-5.42254	15.4844	2.82026	15.9304	-6.59997	23.3235
2010	2.27342	13.4495	5.041717	14.9904	3.606928	16.5499	0.682378	22.8482
2011	1.777833	14.3139	2.8191	15.5015	5.017235	16.6912	1.657657	21.134
2012	-0.79984	14.6878	1.657149	14.9713	1.607907	15.9645	-1.6314	22.8920
2013	-0.48367	14.9464	1.490646	15.9224	1.391892	15.5623	2.093642	22.7502
2014	2.715116	14.1715	2.750335	16.6995	3.318448	15.4968	4.224654	22.9914
2015	5.309239	14.5558	4.174873	17.5444	3.838948	15.6189	3.536425	23.3941
2016	2.450542	14.6754	3.12541	17.4251	3.0626	16.3724	2.280798	23.3207
2017	4.352604	14.8773	3.188341	17.7448	4.805746	16.8101	4.137064	23.2162

Source: Authors compiled

The statistical data is presented in Table 2, which shows the essential features of the tax revenues and tax rates (minimum, maximum, average, median, variance and standard deviation). Microsoft Excel software was subsequently utilized to process the statistical data used in this article.

Table 2. Statistical data for tax revenues and tax rates

Variable	V4 Countries	
	GDP growth rate (%)	Tax rate (%)
Minimum	-6.59997406	13.36082326
Maximum	10.79957705	23.39414753
Average	3.312225903	17.9113379
Median	3.60495886	16.93386008
Variance	7.425407919	9.394793915
Standard Deviation	2.881186494	3.080557988

Source: Authors compiled

The general shape of the Laffer curve, as described above, is presented in Figure 4.

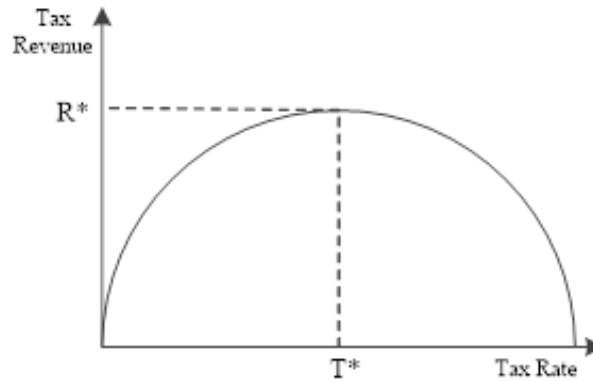


Figure 4. The Laffer curve

Source: Authors compiled

The horizontal axis expresses the tax rate and the vertical axis tax revenues. The curve expresses the non-linear relationship between the tax rate and tax revenues. The curve is shaped like a parabola, whereby T^* represents the optimal tax rate and R^* the corresponding tax revenues. To the left of the optimal tax rate (T^*), a tax rate increase generates increasing tax revenues, whereas to the right of the optimal tax rate (T^*), a tax rate increase generates decreasing tax revenues.

According to the shape of the Laffer curve, we can use binomial to fit it. The regression model can be expressed as follows:

$$TaxRevenue_{i,t} = \alpha * Tax_{i,t} + \beta * Tax_{i,t}^2 + \varepsilon_{i,t} \quad (1)$$

In the above regression model, $TaxRevenue_{i,t}$ expresses the tax revenue of i th country in the t th year, $Tax_{i,t}$ expresses the tax rate of i th country in the t th year, $\varepsilon_{i,t}$ expresses the disturbance term. According to the theory underpinning the Laffer curve, tax revenues should be 0 when the tax rate is 0. In other words, the model should start at the point of origin, i.e. at the point at which the intercept on the vertical axis of the model is zero, namely $\varepsilon_{i,t} = 0$. α and β are unknown model parameters. The regression model should therefore be expressed as:

$$TaxRevenue_{i,t} = \alpha * Tax_{i,t} + \beta * Tax_{i,t}^2 \quad (2)$$

In reality, other factors also affect government income, including bank interest rates (Gavurova et al., 2017). The model above can therefore only be used to show the tendency of tax revenues to first rise and then fall as tax rates rise. Based on the theory of the Laffer curve, a similar relationship (Lin and Jia, 2019) exists between the economic growth rate and the tax rate, which is a more suitable relationship for the study of the macroeconomic situation as controlled by fiscal policy. In light of this, the application of the Laffer curve was generalized, whereby the economic growth rate was adopted instead of tax revenues to determine the optimal tax rate. The generalized regression model of the Laffer curve can be expressed as follows:

$$GDPGT_{i,t} = \alpha * Tax_{i,t} + \beta * Tax_{i,t}^2 \quad (3)$$

According to the methodology described in Section 3, the GDP growth rate was adopted instead of tax revenues in Formula 3 in order to construct the Laffer curve. The values for the GDP growth rates and tax rates were

obtained from the relative data for the V4 countries, as referenced above. Subsequently, it was important to acquire the parameters α and β . According to the definition of the model, the specific description of the two parameters under ideal conditions is presented in Table 3. If the two parameters conform to expectations, the existence of the Laffer curve is proven. To this end, all the data for the V4 countries were combined to construct one model with which to check conformity with the Laffer curve. The results were then subjected to a comparative analysis.

Table 3. Parameter declaration

Parameter	Explanation	Expected symbol
α	Parameter for tax rate	+
β	Parameter for the square of tax rate	-

Source: Authors compiled

Using SPSS statistics software (version 19), the least squares method was applied to carry out a regression analysis and to obtain suitable values for the corresponding parameters.

4. Results and Discussion

According to the description of the study design above, the V4 countries were regarded as a whole. All of the data for the V4 countries were entered into the statistical software for the regression analysis. The Anova table (see Table 4) illustrates the validity of the final result. The final formula for the Laffer curve for the V4 countries can therefore be expressed as follows:

$$GDPGT_{i,t} = 4.565 * Tax_{i,t} - 0.125 * Tax_{i,t}^2 \quad (4)$$

In Table 4, the significance level of the F-value is $0.003 < 0.05$ for the V4 countries, which shows that the regression equation is significant. The two parameters, which are 4.565 and -0.125, conform with the expectation symbol. This implies that the Laffer curve is valid for the situation in the V4 countries and that the relationship between the GDP growth rate and the tax rate is significant. The Laffer curve for the V4 countries can be presented graphically as follows:

Table 4. Anova for V4 countries

Model		Quadratic Sum	df	Mean Square	F	Sig.
1	Regression	83.227	2	41.614	6.251	0.003
	Residual	592.485	89	6.657		
	Total	675.712	91			

Source: Authors compiled

From Figure 5, when compared with the Laffer curves for the individual countries, it can be concluded that the shape of the Laffer curve for the V4 countries combined is more conform with the original shape. In addition, the regression equation for the V4 countries is significant. Within this context, it therefore makes sense to study the Laffer curve for the four countries as a group.

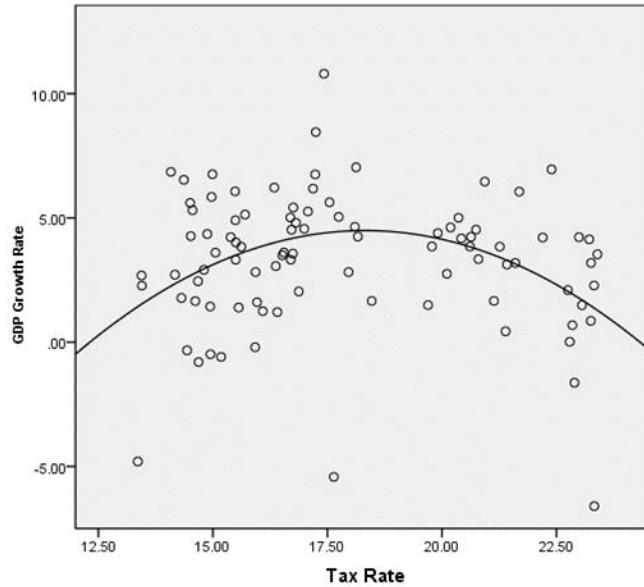


Figure 5. Laffer curve for V4 countries

Source: Authors compiled

Having obtained the parameters with expectation symbols and the Laffer curve with inverted U-shape, the regression equation was utilized to estimate the value of the tax rate that can maximize the GDP growth rate. In order to obtain the optimal value of the tax rate, it was necessary to take the first derivative of Formula 3 and set it to equal 0.

$$\frac{\partial TaxRevenue_{i,t}}{\partial Tax_{i,t}} = \alpha + 2\beta * Tax_{i,t} = 0 \quad (5)$$

So,

$$Tax_{i,t} = -\frac{\alpha}{2\beta} \quad (6)$$

According to the parameters in the regression equation for the V4 countries, it was possible to calculate the optimal value of the tax rate, which equaled 18.26. When this result was checked against the tax rates in the V4 countries, it was found that the Slovak Republic had the most appropriate tax rate at 17.74489, closely followed by Poland at 16.81013, and that the Czech Republic needed to enhance its tax rate, and Hungary decrease its tax rate.

According to Mareček and Machová (2017), the GDP of each country is very important, because its value directly correlates with the amount of public debt within all EU states and thus also the V4. For this reason, government officials should take steps to strengthen economic development in various dimensions of economic life (Gavurova et al., 2021a; Gavurova et al., 2021b).

Conslusions

Tax rate and tax revenue data for the V4 countries for the period 1995-2017 were used to analyze the Laffer curve for the group. The formula is presented according to the shape of the Laffer curve, which is quadratic through the origin. Based on the theory underpinning the Laffer curve, we adopted the GDP growth rate instead of tax revenues. The collected data were summarized, described and presented in figures. For the study, the V4 countries were regarded as a whole, and the overall dataset used to conduct a regression analysis. On this basis, an assessment of the situation was carried out in order to determine the optimal tax rate and tax revenues.

According to the conclusion drawn, it can be stated that the relationship between the GDP growth rate and the tax rate is significant for the V4 countries, and that the parameters of the regression equations conform to the expected symbols. This implies that the Laffer curve conforms with the overall situation in the V4 countries. Further analysis of the optimal tax rate and the situation in each country showed that Poland and the Slovak Republic have the more appropriate tax rates, whereas the Czech Republic and Hungary need to appropriately adjust their tax rates.

References

- Alavuotunki, K., Haapanen, M., & Pirttila, J. (2019). The effects of the value-added tax on revenue and inequality. *The Journal of Development Studies*, 55 (4), 490-508. <https://doi.org/10.1080/00220388.2017.1400015>
- Andreoni, V. (2019). Environmental taxes: Drivers behind the revenue collected. *Journal of Cleaner Production*, 221, 17-26. <https://doi.org/10.1016/j.jclepro.2019.02.216>
- Annuar, H.A., Isa, K., Ibrahim, S.A., & Solarin, S.A. (2018). Malaysian corporate tax rate and revenue: The application of Ibn Khaldun tax theory. *ISRA International Journal of Islamic Finance*, 10 (2), 251-262. <https://doi.org/10.1108/IJIF-07-2017-0011>
- Arbel, Y., Fialkoff, C., & Kerner, A. (2019). Can the Laffer curve become a policy tool for reducing tax evasion? Stratification of property tax collection by land use. *Journal of Urban Management*, 8 (1), 57-74. <https://doi.org/10.1016/j.jum.2018.09.001>
- Bacik, R., Kloudova, J., Gonos, J., & Ivankova, V. (2019). Management of competitiveness and economic performance based in the V4 countries. *Marketing and Management of Innovations*, 3, 73-88. <http://doi.org/10.21272/mmi.2019.3-06>
- Balcerzak, A.P., Klietstik, T., Streimikiene, D. & Smrcka, L. (2017). Non-parametric approach to measuring the efficiency of banking sectors in European Union countries. *Acta Polytechnica Hungarica*, 14 (7), 51-70. <https://doi.org/10.12700/APH.14.7.2017.7.4>
- Bilan, Y., Gavurova, B., Stanislaw, G., Tkacova, A. (2017). The Composite Coincident Indicator (CCI) for Business Cycles. *Acta Polytechnica Hungarica*, 14 (7), 71-90. SI. <https://doi.org/10.12700/aph.14.7.2017.7.5>.
- Bilicka, K. (2019). The effect of loss-offset provisions on the asymmetric behavior of corporate tax revenues in the business cycle. *National Tax Journal*, 72 (1), 45-78. <https://doi.org/10.17310/ntj.2019.1.02>
- Bosi, S., & Desmarchelier, D. (2017). Are the Laffer curve and the green paradox mutually exclusive? *Journal of Public Economic Theory*, 19 (5), 937-956. <https://doi.org/10.1111/jpet.12242>
- Chernick, H., & Reimers, C. (2019). Consumption taxes, income taxes, and revenue sensitivity: States and the Great recession. *Public Finance Review*, 47 (2), 349-381. <https://doi.org/10.1177/1091142117741669>
- Čihovská, V., & Hudec, M. (2018). Measurement and evaluation of the real economic convergence of the V4 countries with the European Union. *Littera Scripta*, 11 (1), 38-53. Retrieved September 9, 2021, from: https://www.littera-scripta.com/wp-content/uploads/2019/05/4_%C4%8Cihovsk%C3%A1-1.pdf
- Colombatto, E. (2015). An alternative to the Laffer curve: Theory and consequences. *Review of Austrian Economics*, 28 (1), 75-92. <https://doi.org/10.1007/s11138-013-0249-1>

- Dahlby, B., & Ferede, E. (2018). The marginal cost of public funds and the Laffer curve: Evidence from the Canadian provinces. *FinanzArchiv*, 74 (2), 173-199. <https://doi.org/10.1628/fa-2018-0005>
- Feve, P., Matheron, J., & Sahuc, J.G. (2018). The horizontally s-shaped Laffer curve. *Journal of the European Economic Association*, 16 (3), 857-893. <https://doi.org/10.1093/jeea/jvx027>
- Gavurova, B., Belas, J., Zvarikova, K., Rigelsky, M., & Ivankova, V. (2021a). The effect of education and R&D on tourism spending in OECD countries: An empirical study. *Amfiteatru Economic*, 23 (58), 806-823. <https://doi.org/10.24818/EA/2021/58/806>
- Gavurova, B., Belas, J., Valaskova, K., Rigelsky, M., & Ivankova, V. (2021b). Relations between infrastructure innovations and tourism spending in developed countries: A macroeconomic perspective. *Technological and Economic Development of Economy*, 27 (5), 1072-1094. <https://doi.org/10.3846/tede.2021.15361>
- Gavurova, B., Cepel, M., Belas, J., & Dvorsky, J. (2020). Strategic management in SMEs and its significance for enhancing the competitiveness in the V4 countries - A comparative analysis. *Management & Marketing. Challenges for the Knowledge Society*, 15 (4) 557-569. <https://doi.org/10.2478/mmcks-2020-0032>
- Gavurová, B., Packová, M., Mišanková, M., & Smrčka, L. (2017). Predictive potential and risks of selected bankruptcy prediction models in the Slovak business environment. *Journal of Business Economics and Management*, 18 (6), 1156-1173. <https://doi.org/10.3846/16111699.2017.1400461>
- Gius, M. (2018). The relationship between tax rates and tax revenue. *Atlantic Economic Journal*, 46 (1), 137-138. <https://doi.org/10.1007/s11293-017-9564-4>
- Kabourková, K., & Popílková, M. (2017). Effect of income tax rebates on net wage of taxpayer in relation to number of children. *Auspicia*, 14 (1), 130-138. Retrieved September 7, 2021, from: <https://vsers.cz/wp-content/uploads/2017/11/Auspicia-1-2017.pdf>
- Kabourková, K., & Rousek, P. (2010). Tax issues of historical and contemporary perspective. In *Expert seminar of the Department of Economics and Management: Collection of Contributions*. České Budějovice: Institute of Technology and Business in Č. Budějovice, 9.
- Kelemen, M., Polishchuk, V., Gavurová, B., Rozenberg, R., Bartok, J.; Gaál, L., Gera, M., Kelemen, M., Jr. 2021. Model of Evaluation and Selection of Expert Group Members for Smart Cities, Green Transportation and Mobility: From Safe Times to Pandemic Times. *Mathematics* 2021, 9, 1287. <https://doi.org/10.3390/math9111287>
- Kliečtik, T., Mišanková, M., Valášková, K. & Švábová, L. (2018). Bankruptcy prevention: New effort to reflect on legal and social changes. *Science and Engineering Ethics*, 24 (2), 791-803. <https://doi.org/10.1007/s11948-017-9912-4>
- Kubátová, K. (2013). Impact of the crisis on the structure of tax revenues of OECD countries. *Littera Scripta*, 6 (1), 51-60. Retrieved September 9, 2021, from: https://www.littera-scripta.com/wp-content/uploads/2019/05/Kub%C3%A1tov%C3%A1-Vliv_krize_na_stukturu_da%C5%88ov%C3%BDch_v%C3%BDnos%C5%AF_zem%C3%AD_OECD1.pdf
- Langer, S., & Korzhenevych, A. (2018). The effect of industrial and commercial land consumption on municipal tax revenue: Evidence from Bavaria. *Land Use Policy*, 77, 279-287. <https://doi.org/10.1016/j.landusepol.2018.05.052>
- Liesegang, C. (2019). Runkel M. Equalizing tax bases or tax revenues under tax competition? The role of formula apportionment. *Journal of Public Economic Theory*, 21 (1), 98-115. <https://doi.org/10.1111/jpet.12319>
- Lin, B., & Jia, Z. (2019). Tax rate, government revenue and economic performance: A perspective of Laffer curve. *China Economic Review*, 56, 101-114. <https://doi.org/10.1016/j.chieco.2019.101307>
- Mao, C.W., & Wu, W.C. (2018). Does the government-mandated adoption of international financial reporting standards reduce income tax revenue? *International Tax & Public Finance*, 26 (1), 145-166. <https://doi.org/10.1007/s10797-018-9495-2>
- Mareček, J. & Machová, V. (2017). *The influence of public debt on the performance of the economy*. In Váchal, Jan; Vochozka, Marek; Horák, Jakub. SHS Web of Conferences - Innovative Economic Symposium 2017: Strategic Partnership in International Trade. 1st ed., Les Ulis, France: EDP Sciences, 9. <https://doi.org/10.1051/shsconf/20173901018>
- Marečková, E. (2013). Municipal area as a criterion of the Czech tax assignment system. *Littera Scripta*, 6 (2), 77-90, Retrieved September 9, 2021, from: https://www.littera-scripta.com/wp-content/uploads/2019/05/Mare%C4%8Dkov%C3%A1-Municipal_area_as_a_criterion_of_the_czech_tax_assignment_system1.pdf

- Matikka, T. (2018). Elasticity of taxable income: Evidence from changes in municipal income tax rates in Finland. *Scandinavian Journal of Economics*, 120 (3), 943-973. <https://doi.org/10.1111/sjoe.12236>
- Mertens, K., & Olea, J.L.M. (2018). Marginal tax rates and income: New time series evidence. *Quarterly Journal of Economics*, 133 (4), 1803-1884. <https://doi.org/10.1093/qje/qjy008>
- Miravete, E.J., Seim, K., & Thurk, J. (2018). Market power and the Laffer Curve. *Econometrica*, 86 (5), 1651-1687. <https://doi.org/10.3982/ECTA12307>
- Mourre, G., & Reut, A. (2019). Non-tax revenue in the European Union: A source of fiscal risk? *International Tax and Public Finance*, 26 (1), 198-223. <https://doi.org/10.2765/63789>
- Novák, V., Vokoun, M., & Vochozka, M. (2016). Institutional analysis of the contemporary regional labour market in the Czech Republic. *E & M Ekonomie a Management*, 19 (3), 4-19. <https://doi.org/10.15240/tul/001/2016-3-001>
- Nutahara, K. (2015). Laffer curves in Japan. *Journal of the Japanese and International Economies*, 36, 56-72. <https://doi.org/10.1016/j.jjie.2015.02.002>
- Ofori, I.K., Obeng, C.K., & Armah, M.K. (2018). Exchange rate volatility and tax revenue: Evidence from Ghana. *Cogent Economics & Finance*, 6(1), 1-17. <https://doi.org/10.1080/23322039.2018.1537822>
- Parchet, R. (2019). Are local tax rates strategic complements or strategic substitutes? *American Economic Journal-Economic Policy*, 11 (2), 189-224. <https://doi.org/10.1257/pol.20150206>
- Patrick, F., Matheron, J., & Sahuc, J.G. (2013). The Laffer curve in an incomplete-markets economy. *Working Papers*, 2, 1-26. <https://doi.org/10.2139/ssrn.2306004>
- Polishchuk, V., Kelemen, M., & Kozuba, J. 2019. Technology Improving Safety of Crowdfunding Platforms Functioning in the Context of the Protection of the Start-Up Investors in the Financial and Transport Sectors. *Journal of KONBiN*, vol.49, no.1, 2019, pp.313-330. <https://doi.org/10.2478/jok-2019-0016>
- Popílková, M., & Raušer, D. (2018). Financial self-sufficiency and the position of selected types of small municipalities in the region of South Bohemia in 2013-2016. *Littera Scripta*, 11 (1), 116-131. Retrieved September 9, 2021, from: https://www.littera-scripta.com/wp-content/uploads/2019/05/10_Pop%C3%ADlkov%C3%A1-1.pdf
- Rousek, P., & Kralova, V. (2010). Fiscal importance of taxes. In *Expert seminar of the Department of Economics and Management: Collection of Contributions*. České Budějovice: Institute of Technology and Business in Č. Budějovice, 9.
- Rybáček, V. (2018). The size of government in empirical research: A case study from the Czech Republic. *Littera Scripta*, 11 (2), 141-154. Retrieved September 9, 2021, from: https://www.littera-scripta.com/wp-content/uploads/2019/05/14_Ryb%C3%A1%C4%8Dek-1.pdf
- Steinmüller, E., Thuncke, G.U., & Wamser, G. (2019). Corporate income taxes around the world: a survey on forward-looking tax measures and two applications. *International Tax and Public Finance*, 26 (2), 418-456. <https://doi.org/10.1007/s10797-018-9511-6>
- Šuleř, P., & Machová, V. (2020). *Financial stability in Central European countries: Case of the Visegrad four*. In Uslu, F. Proceedings of the 7th International Conference on Education and Social Sciences (INTCESS 2020). 1st ed., Istanbul, Turkey: International Organization Center of Academic Research, 1218-1223. Retrieved September 8, 2021, from: https://www.icerints.org/intcess20_e-publication/papers/381.pdf
- Szigeti, S., Evetovits, T., Kutzin, J., & Gaal, P. (2019). Tax-funded social health insurance: an analysis of revenue sources, Hungary. *Bulletin of the World Health Organization*, 97 (5), 335-348. <https://doi.org/10.2471/BLT.18.218982>
- Tennant, S.N., & Tracey, M.R. (2019). Corporate profitability and effective tax rate: The enforcement effect of large taxpayer units. *Accounting and Business Research*, 49 (3), 342-361. <https://doi.org/10.1080/00014788.2018.1512398>
- Toossi, S., & Zhang, P.J. (2019). Video gambling adoption and tax revenues: Evidence from Illinois. *Public Budgeting and Finance*, 39 (1), 67-88. <https://doi.org/10.1111/pbaf.12211>

Trabandt, M., & Uhlig, H. (2011). The Laffer curve revisited. *Journal of Monetary Economics*, 58 (4), 305-327. <https://doi.org/10.1016/j.jmoneco.2011.07.003>

Varela-Candamio, L., & Morollon, F.R. (2017). Urban agglomerations and taxation: Some ideas derived from applying the Laffer curve to Spanish income tax under different spatial scenarios. *Trimestre Economico*, 84 (333), 121-136. <https://doi.org/10.20430/ete.v84i333.264>

Wang, S., Merriman, D., & Chaloupka, F.J. (2019). Relative tax rates, proximity and cigarette tax noncompliance: Evidence from a national sample of littered cigarette packs. *Public Finance Review*, 47 (2), 276-311. <https://doi.org/10.1177/1091142118803989>

Wanniski, J. (1978). Taxes, revenues, and the 'Laffer Curve'. *The Public Interest*. Retrieved September 8, 2021, from: <https://www.nationalaffairs.com/storage/app/uploads/public/58e/1a4/c54/58e1a4c549207669125935.pdf>

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ADVANTAGES OF FUZZY APPROACH COMPARED TO PROBABILISTIC APPROACH IN PROJECT EVALUATION

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Abstract. Uncertainty is often encountered in relation to randomness or fuzziness. In the case of randomness, it can be described by means of a probability distribution; in the case of fuzziness, the fuzzy theory is applied. In the theoretical part, the authors deal with basic tools for describing both types of uncertainty. Probability and fuzzy method are interpreted in the context of their analogies and principal differences. Both techniques are applied in order to quantify the present expected value of a specific development project. The probabilistic solution leads to the point value $E[PV]$, the fuzzy solution establishes the triangular fuzzy number with the subjective $E[PV]$ not burdened with possible exaggerated expectations. The fuzzy approach proved to extend the probabilistic outcome by other additional information useful for decision-makers with different risk propensity.

Keywords: uncertainty; expected value; fuzzy number; risk propensity; evaluation

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JEL Classifications: C02, C11, C45, C46, C63

1. Introduction

There is no doubt that in the last few years, there has been a massive development of artificial intelligence methods in the world and their implementation directly into practice (Horák et al, 2020). In connection with this, Vochozka (2016a) tried to find out whether the results obtained using neural networks are better than the results obtained using regression analysis. Horák and Machová (2019) compared both of these approaches on the example of the prediction of PRC exports to the USA. Vrbka et al. (2019) in turn used neural networks to predict the trade balance between the PRC and the USA with regard to seasonal fluctuations. Besides neural networks and genetic algorithms, this area includes approaches or systems that are based on fuzzy logic. A common feature of the above methods is the fact that they are inspired by nature and natural phenomena (Amari, 2013).

The English term “fuzzy” (meaning blurred, vague, unclear) is referred to in Běhounek and Cintula (2006) as a mathematical discipline that works with a well-defined notion of inaccuracy. Kuchta (2000) adds that this refers mainly to the theory of fuzzy logic and fuzzy sets. Zadeh (1965) is the author of the formulation of fuzzy sets in the 1970s. This approach gained popularity at the turn of the 1980s and 1990s thanks to its fascinating applications implemented in Japan and subsequently in other countries. Since then, fuzzy approach has been considered a completely standard method. Dourra and Siy (2002) state that this approach can solve originally unsolvable problems in many areas, as it is simpler than other methods. Herrera et al (2009) consider the possibility of including inaccuracy and a relatively easy way of working with the meanings of natural language, which is one of the most important parts of human life, to be an essential source of success. Fuzzy approach is applied especially in regulation and control, and can be found more and more often in classification, decision-making, image recognition or in currently increasingly popular area of prediction (Ansari and Abu Bakar, 2014). Wang (2019) also used Fuzzy's approach to predict corporate financial distress. The applicability of this approach was proven and verified on a set of 180 companies, of which 50% were in financial distress and the other 50% were companies that were in no financial need. In contrast, Hašková (2016) used Fuzzy logic to assess the risk to which the investor is exposed. Models based on the correct use of fuzzy logic and a fuzzy set of devices to reveal the uncertainty of experts' reasoning, which ensure the authenticity of scientific results focused on the technology improving the security of crowdfunding platforms, are found in the work of researchers Polishchuk et al. (2019), etc.

Hašková (2019) states that one of the reasons for the inaccuracy of any prediction may be the lack of information needed to eliminate the uncertainty that can be encountered in any non-deterministic environment. If the uncertainty is based on insufficient knowledge of the relevant values of known factors entering the prediction model, it is the so-called external uncertainty (López-duarte and Vidal-Suárez, 2010). In contrast, according to Bloom (2009), the so-called internal uncertainty is based on the approximate nature of the formal description of the considered relationships between the prediction model's inputs and outputs. In both cases, the uncertainty of two different types can be encountered. Within the research of the issue, we find the application work of researchers Kelemen et al. (2019), and Polishchuk et al. (2019), as fuzzy models, which are embedded in a generalized algorithm and tested in the example of risk assessment, and quantitative evaluation of projects aimed at initiating the environment in the aviation sector, and an innovative hybrid competency assessment model based on fuzzy logic and a network for neuro-fuzzy assessment as in Kelemen et al. (2021).

According to Woju and Balu (2020), uncertainty is usually classified as random and fuzzy. Random uncertainty arises from the inherent randomness of the physical properties and environmental system, while fuzzy uncertainty stems from the lack of relevant knowledge and inaccurate information about the system (Li et al, 2016). Hašková (2019) adds that when talking about uncertainty in the sense of “randomness”, objectively identified basic characteristics are known, while uncertainty in the sense of “lack of knowledge - ignorance” is usually derived from vague terms - a little, approximately, little, simply, etc. The diverse types of uncertainties and ways to deal with them have been addressed in many studies. For example, Marano and Quaranta (2008) state that the problem of estimating random uncertainty is usually performed by probability theory requiring a large number of samples, while fuzzy uncertainty is usually modelled by possibility theories requiring a small sample.

The objective of this paper is to put fuzzy and probabilistic approach into context. The methodological part identifies the main principles, differences, and analogies of both approaches. In the application part, both approaches are compared on the basis of quantifying the internal value (PV) of a development project. The results are discussed and interpreted. The conclusion part summarizes key facts, principles, and benefits of the contribution from the theoretical and application point of view.

2. Methodological approach

The most commonly used criterion in managerial decision-making is the expected present value (E[PV]) indicating the value of the expected annual cash flows $E[CF_i]$ in years $i = 1, 2$ to n that are transformed to the moment of decision – see formula (1).

$$E[PV] = \sum_{i=1}^n E[CF_i] / \prod_{j=1}^i (1 + r_j) \quad (1)$$

In (1) CF_i , $i > 0$, symbols of net cash flows generated by the project in i -year of its implementation, r_j is the annual discount rate valid in the j -year of the course of the project.

2.1 Public approach in PV evaluation

Probabilistic approach (see relation (1)) is used if probability distribution of the frequency of possible cash flows outcomes is known. Otherwise, most decision-makers rely on the subjective opinion and expert knowledge when estimating the series of cash flows from the investment under consideration.

The analysis of probabilistic approach within investment evaluation in terms of E[PV] and its alternatives is addressed in professional literature by e. g. Zinn et al (1977), who analysed and justified the formulas of the expected net present value, variance, and semi-variance of net present values of various cash flow profiles at random time. Tufekci and Young (1987) present the method of the moments of the net present value in probabilistic investment alternatives. The publication of Benzion and Yagil (1987) compares discount methods for the evaluation of multi-time stochastic income flows that are identical and time-independent.

2.2 Fuzzy approach in PV evaluation

Fuzzy approach is based on the theory of fuzzy sets Zadeh (1983) and represents an alternative in the case of uncertain data, for which it is not possible to construct a probability distribution. In reality, a statistical description is seldom available for creating the probability structure of the CF_i values and the values of the discount rates r_j for long-term projects. The basis of the fuzzy set theory is described in detail in e.g. (Hašková, 2017).

In short, a fuzzy set is a class of ordered pairs in which the first element is an element of the universe in consideration, the second element is a part of the interval $\langle 0,1 \rangle$ that assigns each member a degree of membership in a subset of the universe (i.e., to the support of the fuzzy set). The degree of membership reflects the extent to which the element is compatible with the support of the fuzzy set. More specifically, as Hašková and Fiala (2019) state: the set U is a field of reasoning or discussion (a universe in consideration), $\mu_A: U \rightarrow \langle 0,1 \rangle$ is a membership function, and $A = \{(y, \mu_A(y)) : y \in U\}$ the set of all ordered pairs $(y, \mu_A(y))$, in which $0 \leq \mu_A(y) \leq 1$ indicates the membership degree of the pair $(y, \mu_A(y))$ to the set A on the given $y \in U$. Thus, A is a fuzzy subset of the universe U . An important characteristic of the fuzzy subset A is its support $U_A = \{y : 0 < \mu_A(y) \leq 1, y \in U\} \subset U$. In terms of fuzzy logic, $\mu_A(y) = |y \in U_A|$; herein $|y \in U_A|$ designate the degree of veracity of the statement that y is the element of the support on the fuzzy set A . The element $y \in U$ with the degree of veracity $\mu_A(y) = 0.5$ is called crossover point in A . In the case of veracity degrees greater than 0.5, the element y rather belongs to U_A , while in the case of smaller veracity degrees it rather does not belong to it.

The fuzzy subset A , whose support $U_A \subset U \subset R$, where R is a set of real numbers and its function μ_A is given by normality and convexity, is called the fuzzy number. There are six different shapes of membership functions μ_A

of fuzzy numbers: triangular, trapezoidal, bell-shaped, sinusoidal, cosinusoidal (Kahraman, 2008). The so defined fuzzy numbers can formally represent uncertain variables.

There, the apparent analogy shall be noticed between the function $f(x)$ (the probability density of a random variable x) and the function $\mu_A(x)$ (the degree of the element x membership to the support of the uncertain variable – a fuzzy number A). For instance, a similar meaning that in the case of a random variable x achieves an average or expected value $E[x]$, which corresponds to the horizontal coordinate of the gravity centre of the area under the function $f(x)$ on its definition field, is represented by the horizontal coordinate of the centre of gravity under the course of the function $\mu_A(x)$ above the interval defined by fuzzy support A in the case of the uncertain variable.

This analogy can be useful when solving problems with variables that are beyond descriptive statistics. In such a case, a reliable point estimation can be carried out using the corresponding coordinate of the position of gravity centre of an appropriate fuzzy number with the support matching to the set of all possible results. In practice, this approach is often applied to measure an issue that is difficult to quantify and it is thus changed for a more easily measurable issue (e. g. the value of the quality of life for measuring GDP – see (Ackoff, 1989).

Let us assume that $A = (A_L, A, A_R)$ and $B = (B_L, B, B_R)$ are triangular fuzzy numbers, where the indexes L and R indicate the left and right limits of their supports. Let the middle numbers be the subjectively expected values for which it can be assumed that $\mu_A(A) = \mu_B(B) = 1$ (the subjectively expected values are placed at the centre of the fuzzy number supports; in the case of symmetrical probability density, they coincide with the statistically expected values).

Application of the algebraic operations (+), (−), (·) and (/) of the calculus of triangular fuzzy numbers stated in Zadeh (1965), from which we mention $A (+) B = (A_L+B_L, A+B, A_R+B_R)$, $A (-) B = (A_L-B_R, A-B, A_R-B_L)$, $k (·) A = (k \cdot A_L, k \cdot A, k \cdot A_R)$ and $A (/) B = (A_L/B_R, A/B, A_R/B_L)$, enables the formulation of the fuzzy number PV = (PVL, PV, PVR) in order to describe a model of uncertain cash flows (the fuzzy numbers CF_i) and uncertain discount rates (the fuzzy numbers r_j), as shown in Hašková (2017):

$$\begin{aligned} PV_L &= \sum_{i=1}^n [\max\{CF_{iL}, 0\} / \prod_{j=1}^i (1+r_{jR}) + \min\{CF_{iL}, 0\} / \prod_{j=1}^i (1+r_{jL})], \\ PV &= \sum_{i=1}^n CF_i / \prod_{j=1}^i (1+r_j), \\ PV_R &= \sum_{i=1}^n [\max\{CF_{iR}, 0\} / \prod_{j=1}^i (1+r_{jL}) + \min\{CF_{iR}, 0\} / \prod_{j=1}^i (1+r_{jR})]. \end{aligned} \quad (2)$$

3. Practical application

In order to show the differences, both approaches will be applied and analysed within a hypothetical but a realistic decision-making managerial task. Table 1 below shows the basic input parameters of the task and the focus.

Table 1. The input data of the task

Object of investment	Investment in the construction of a residential building on the outskirts of the capital.
Timetable for completion and possible scenarios	Completion of the construction completion including the inspection of apartments is planned after two years from the start. If there is a one-year delay in the plan, the company decides either to complete the project with annual one-year delay or to sell the project in the third year at an estimated price of EUR 30 million. The possibilities of completing the construction without any delay or with a one-year delay are equal.
Estimate of demand for apartments	In the case of the completion of the construction, the apartments will be sold in the following year. The amount of budgeted revenue from the sale of the apartments (net revenue refers to the difference between the revenues from the sale of the apartments and the operating costs, paid fixed costs associated with the investment and income tax) depends on the development of uncertain demand for apartments. In the case of selling the apartments in the third year, strong demand is estimated with an 80% probability and weak demand with a 20% probability; in the case of postponing the sale, strong demand is estimated with a 60% probability of 60 % and weak demand with a 40% probability.
Project's discount rate	The discount rate of the project r is equal to the average project capital costs of 15 %. As the company does not intend to change the structure of its long-term funding sources, it is considered a constant.
Net revenues scenarios	The prediction of net revenues in the third year N_{31} and N_{32} , and the fourth year N_{41} and N_{42} from the sale of the apartments are shown in the decision tree in Figure 1.
The managers' goal	a) To assess the project within its expected value $E[PV]$. b) To specify the maximum investment if the project is loss-making concerning an adequate project risk rate.

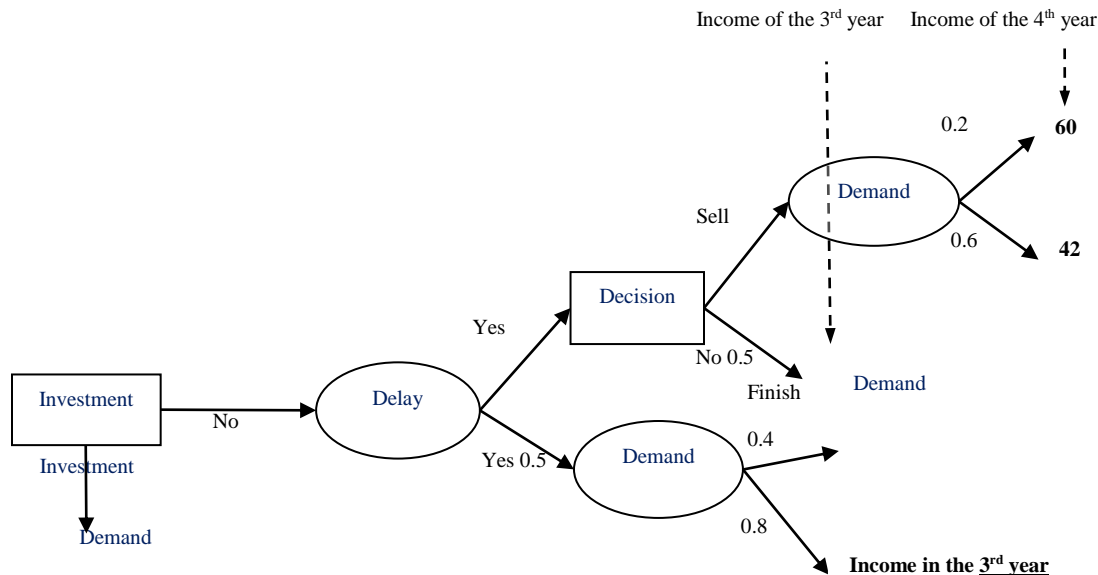


Figure 1. Project decision tree at current prices of the 3rd and 4th year in millions of EUR

Source: Own processing.

Additional analyses performed enable assessing whether the probability criterion $E[PV]$ plays a decisive role in the manager decision-making.

3.1 Probabilistic evaluation of task based on $E[PV]$

The model of the decision tree (see Fig. 1) shows the probabilistic solution to the task. The input parameters are the point estimations of the net revenue random variable. Completion time and estimate of demands are also random variables described by the probabilistic distribution. The positive values of the revenue estimates suggest that $E[PV] > 0$ (see the goal a)). The goal b) focuses on answering the question of “How much to invest ($I = ?$)” – the first decision node.

In the second decision node (Decision), two values are compared: the amount of EUR 30 million from the sale of the project outcome in the 3rd year and the statistically calculated amount of net revenue $(0.6 \cdot 42 + 0.4 \cdot 28) / 1.15 = 31.65$. This amount is higher than 30 million; therefore, the “Decision” node can be cancelled. This enables the simplification of the tree structure in Fig. 1 into the form shown in Fig. 2. Each of the four scenarios is evaluated by its current value $PV_{ij} = N_{ij} / (I + r)^i$ to the time $t = 0$ ($I = ?$), where N_{ij} represent the net revenue in the 3rd and 4th year of the project implementation. It applies that $E[PV] = 0.3 \cdot PV_{41} + 0.2 \cdot PV_{42} + 0.4 \cdot PV_{31} + 0.1 \cdot PV_{32} = 0.5 \cdot (0.6 \cdot PV_{41} + 0.4 \cdot PV_{42}) + 0.5 \cdot (0.8 \cdot PV_{31} + 0.2 \cdot PV_{32}) = 0.5 \cdot (E[PV_4] + E[PV_3])$. The last derived equality enables further reduction of scenarios, as shown in Fig. 2 below, in which $E[PV_4] = 36.4 / 1.15^4$ and $E[PV_3] = 53.8 / 1.15^3$ have the same probability of occurrence.

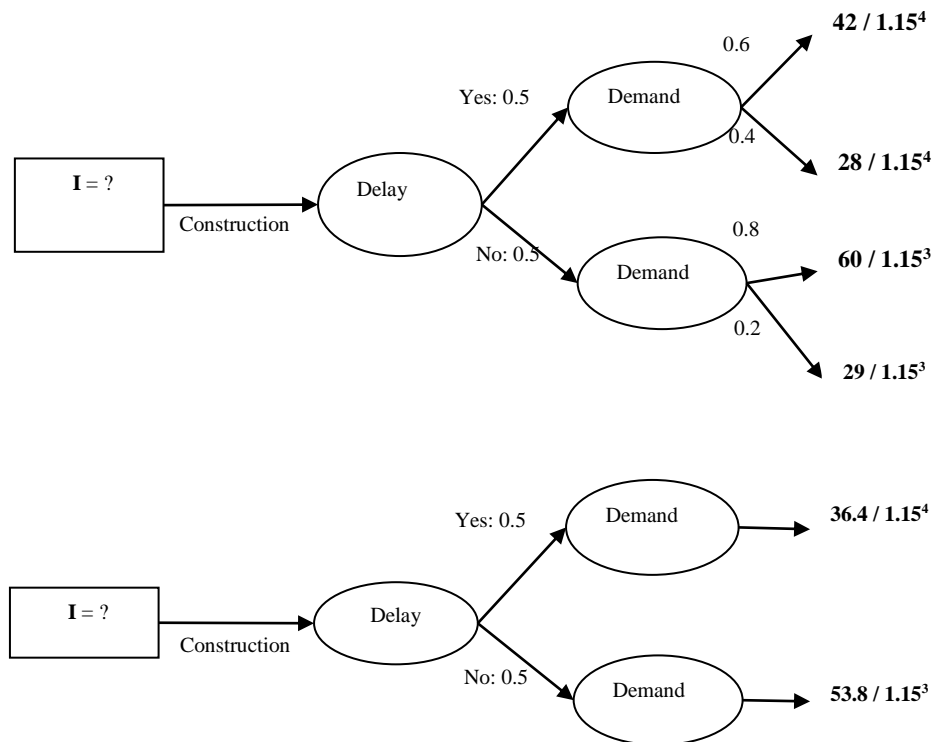


Figure 2. Simplifications of tree structure shown in Fig. 1 based on results of managerial calculations

Source: Own processing.

The sought solution of $E[PV] = 0.5 \cdot (E[PV4] + E[PV3]) = 0.5 \cdot (36.4 / 1.154 + 53.8 / 1.153) \approx 28.1$ million EUR. This also provides information about the maximum possible investment in a project that is not loss-making

3.2 Fuzzy evaluation of task based on interval values

The fuzzy approach deals with uncertainty by replacing the point estimates with triangular fuzzy numbers in the form of (L, S, P); the left edge of the interval (L) indicates the smallest considered value, the right edge (P) indicates the largest estimated value, and the centre (S) represents the middle of the interval. The S value is formed in accordance with the principle of indifference (Pettigrew, 2014). It results from its nature that when multiple alternative outcomes occur with no relevant reason to prefer one over another, they will be assigned the same probability. Therefore, S is the subjectively expected value, which does not converge to any of the interval limits (based on the observation, the statistically expected value is objective). The task in question contains uncertain data on future demand, which makes the resulting net revenue value uncertain as well.

The subjectively expected value of the fuzzy procedure is $35 / 1.15 \approx 30.4$, which is compared with the expected amount for the sale of the project outcome - EUR 30 (see Fig. 1, the upper "Decision" node). As the subjective value is higher than 30, the upper "Decision" node can be ignored and the model can be constructed in a reduced way in analogy to Fig. 2 to get Fig. 3, where the second subjective value is 44.5 (see the "Demand" node in Fig. 1 and Fig. 2, above).

The application of the tools of interval calculus leads to the following solution:

$$E[PV]_L, E[PV], E[PV]_R = (0.5 \cdot 28 / 1.15^4 + 0.5 \cdot 29 / 1.15^3; 0.5 \cdot 30.4 / 1.15^4 + 0.5 \cdot 44.5 / 1.15^3; 0.5 \cdot 42 / 1.15^4 + 0.5 \cdot 60 / 1.15^3) = (16.3; 23.3; 31.7), \quad (3)$$

Where the subjective $E[PV]$ of potential net revenue from the sale of the apartments is written in italics.

The fuzzy $E[PV]$ number (16.3; 23.3; 31.7) can be viewed as an interval of possible present values generated by the project, in which the left number represents a pessimistic scenario, while the right number can be perceived as a result of an optimistic scenario, and the middle number represents the subjectively expected value. It shall be noticed that the interval range also provides information on the maximum investment costs for a project that is not loss making.

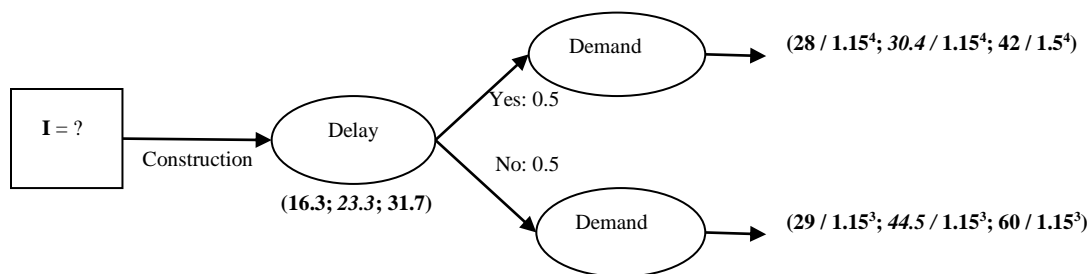


Figure 3. Reduced model of task - fuzzy approach perspective

Source: Own processing.

4. What do the analyses indicate?

Fuzzy analysis extends the standard probabilistic result by other information. These particularly follow from the nature of the fuzzy number $\underline{E[PV]} = (E[PV]_L, E[PV], E[PV]_R)$, whose limit values indicate the smallest and highest possible present values of the project with the middle value representing the *subjectively* expected one. The range $(E[PV]_L, E[PV]_R)$ provides an idea about the span between the pessimistic and optimistic development of the project in terms of its expected outcomes.

The fact that the *subjective* $E[PV] = 23.3$ is lower than the *probabilistic* $E[PV] = 28.1$ confirms the finding (e. g. in Kahneman (1993) that managers tend to exaggerate positive flows and reduce negative flows. This tendency corresponds with the probability distribution of the demand for the sale of the apartments both in the 3rd and the 4th year of the project in question. This tendency can result in late completion of projects and exceeding the planned budget; consequently, in some of them, the expectations of the investors may even never be fulfilled (Vochozka, 2016b).

A manager assuming on the basis of $E[PV] = 28.1$ that the investment of EUR 27 million will provide him with, for instance, a minimal required profit of EUR 0.8 million, is wrong. The fuzzy analysis says that the achievement of this objective is most likely if the initial investment does not exceed EUR 15.5 million (i.e., 0.8 less than the value of pessimistic scenario PV_L). Thus, a question arises whether the project would be feasible under these circumstances. The answer depends, among other things, on the investor's willingness to take risks.

From the above, it is clear that knowing the limits of the possible interval_values $\underline{E[PV]}$ provided by the fuzzy approach can be useful; it provides the decision-makers with extra information in terms of possible development project scenarios.

5. Conclusions

In the area of management, uncertainty of different types is encountered. The basic distinction sees uncertainty in the sense of randomness and uncertainty in the sense of fuzziness. The first type mentioned could be described, for instance, by a probability distribution, while in the latter case, the technique of fuzzy approach has been successfully proved.

The most commonly used probability criterion in financial management is the expected present value $E[PV]$. In the fuzzy approach, the decision criterion is performed by the fuzzy number $\underline{E[PV]} = (E[PV]_L, E^*[PV], E[PV]_R)$ of uncertain cash flows ($\underline{CF_i}$ fuzzy numbers) and uncertain discount rates ($\underline{r_i}$ fuzzy numbers). L and R stand for the left and right limits of the support of the fuzzy number.

The analogies and differences of the approaches were described in order to determine the value of the project of constructing and selling apartments by means of $E[PV]$ and $\underline{E[PV]}$. The comparison revealed that the fuzzy approach extends the standard $E[PV]$ result by additional information. More specifically, $E[PV]$ is a weighted average, whose calculation erases all limits given by the project's extreme scenarios. The fuzzy number $\underline{E[PV]} = (E[PV]_L, E^*[PV], E[PV]_R)$ provides decision-makers with an interval of possible values where the centre value is a subjectively expected value not burdened with excessive optimism or scepticism. Taking these limits into consideration provides useful information to decision-makers with a different propensity to risk.

The above stated advantages of fuzzy approach compared to the probability approach are the original benefits of the application. The theoretical superstructure identifies the analogy between the probabilistic and fuzzy approach.

References

Ackoff, R. L. (1989). From data to wisdom. *Journal of Applied Systems Analysis*, 16 (1), 3-9.

Amari, S. (2013). Dreaming of mathematical neuroscience for half a century. *Neural Networks*, 37, 48-51. <https://doi.org/10.1016/j.procs.2013.05.092>

Ansari, A., & Abu Bakar, A. A. (2014). A Comparative study of three artificial intelligence techniques: Genetic algorithm, neural network, and fuzzy logic, on scheduling problem. *Proceedings 2014 4th International Conference on Artificial Intelligence with Applications in engineering and Technology*, 31-36. <https://doi.org/10.1109/ICAJET.2014.15>

Běhounek, L., & Cintula, P. (2006). From fuzzy logic to fuzzy mathematics: A methodological manifesto. *Fuzzy Sets and Systems*, 157 (5), 642-646. <https://doi.org/10.1016/j.fss.2005.10.011>

Benzion, U., & Yagil, J. (1987). On the discounting formula for a stream of independent risky cashflows. *The Engineering Economist*, 32 (4), 337-345. <https://doi.org/10.1080/00137918708902972>

Bloom, N. (2009). The impact of uncertainty shocks. *Econometrica*, 77 (3), 623-685. <https://doi.org/10.3982/ECTA6248>

Dourra, H., & Siy, P. (2002). Investment using technical analysis and fuzzy logic. *Fuzzy Sets and Systems*, 127 (2), 221-240. [https://doi.org/10.1016/S0165-0114\(01\)00169-5](https://doi.org/10.1016/S0165-0114(01)00169-5)

Hašková, S. (2019). An alternative approach for estimating GDP growth rate: Fuzzy prediction model. *ACC Journal*, 25 (2), 55-63. <https://doi.org/10.15240/tul/004/2019-2-004>

Hašková, S. (2017). Contribution to economic efficiency evaluation of projects in terms of uncertainty. *35th International Conference on Mathematical Methods in Economics*, 213-218.

Hašková, S. (2016). Evaluation of the Quality of the Entrepreneurial Environment on the Basis of Fuzzy Logic. *Littera Scripta*, 9 (3), 10-23. Retrieved October 14, 2021, from <https://www.littera-scripta.com/wp-content/uploads/2019/05/Evaluation-of-the-Quality-of-the-Entrepreneurial-Environment-on-the-Basis-of-Fuzzy-Logic-1.pdf>

Hašková, S., & Fiala, P. (2019). A fuzzy approach for the estimation of foreign investment risk based on values of rating indices. *Risk Management*, 21, 183-199. <https://doi.org/10.1057/s41283-019-00051-1>

Herrera, F., Alonso, S., Chiclana, F., & Herrera-Viedma, E. (2009). Computing with words in decision making: foundations, trends and prospects. *Fuzzy Optimization and Decision Making*, 8 (4), 337-364. <https://doi.org/10.1007/s10700-009-9065-2>

Horák, J., & Machová, V. (2019). Comparison of neural networks and regression time series on forecasting development of US imports from the PRC. *Littera Scripta*, 12 (1), 28-42. Retrieved October 14, 2021, from https://www.littera-scripta.com/wp-content/uploads/2020/03/Horak_Machova-citace-1-form-oprava-%C4%8D%C3%ADsla-str%C3%A1nek.pdf

Horák, J., Vrbka, J., & Šuleř, P. (2020). Support vector machine methods and artificial neural networks used for the development of bankruptcy prediction models and their comparison. *Journal of Risk and Financial Management*, 13 (3), 15. <https://doi.org/10.3390/jrfm13030060>

Kahneman, D. (1993). Timid choices and bold forecasts: A cognitive perspective on risk taking. *Lovallo, Management Science*, 39 (1), 17-31. Retrieved October 14, 2021, from <https://www.jstor.org/stable/2661517>

Kahraman, C. (2008). *Fuzzy multi-criteria decision making: Theory and applications with recent developments*. 16 Springer Science & Business Media, Springer-Verlag US.

Kelemen, M., Polishchuk, V., Gavurová, B., Szabo, S., Rozenberg, R., Gera, M., Kozuba, J., Andoga, R., Divoková, A., & Blišťan, P. (2019). Fuzzy Model for Quantitative Assessment of Environmental Start-up Projects in Air Transport. *Int. J. Environ. Res. Public Health* 2019, 16, 3585. <https://doi.org/10.3390/ijerph16193585>

Kelemen, M., Polishchuk, V., Gavurová, B., Rozenberg, R., Bartok, J., Gaál, L., Gera, M., Kelemen, M., Jr. (2021). Model of Evaluation and Selection of Expert Group Members for Smart Cities Green Transportation and Mobility: From Safe Times to Pandemic Times. *Mathematics* 2021, 9, 1287. <https://doi.org/10.3390/math9111287>

- Kuchta, D. (2000). Fuzzy capital budgeting. *Fuzzy Sets and Systems*, 111 (3), 367-385. [https://doi.org/10.1016/S0165-0114\(98\)00088-8](https://doi.org/10.1016/S0165-0114(98)00088-8)
- Li, G., Lu, Z., Li, L., & Ren, B. (2016). Aleatory and epistemic uncertainties analysis based on non-probabilistic reliability and its Kriging solution. *Applied Mathematical Modelling*, 40 (9/10), 5703-5716. <https://doi.org/10.1016/j.apm.2016.01.017>
- López-duarte, C., & Vidal-Suárez, M. M. (2010). External uncertainty and entry mode choice: Cultural distance, political risk and language diversity. *International Business Review*, 19 (6), 575-588. <https://doi.org/10.1016/j.ibusrev.2010.03.007>
- Marano, G., & Quaranta, G. (2008). Fuzzy-Based robust structural optimization. *International Journal of Solids and Structures*, 45 (11/12), 3544-3557. <https://doi.org/10.1016/j.ijsolstr.2008.02.016>
- Pettigrew, R. (2014). Accuracy, risk, and the principle of indifference. *Philosophy and Phenomenological Research*, 92 (1), 35-59. <https://doi.org/10.1111/phpr.12097>
- Polishchuk, V., Kelemen, M., Gavurová, B., Varotsos, C., Andoga, R., Gera, M., Christodoulakis, J., Soušek, R., Kozuba, J., Blišťan, P., & Szabo, S., Jr. (2019). A Fuzzy Model of Risk Assessment for Environmental Start-Up Projects in the Air Transport Sector. *Int. J. Environ. Res. Public Health* 2019, 16, 3573. <https://doi.org/10.3390/ijerph16193573>
- Polishchuk, V., Kelemen, M., & Kozuba, J. (2019). Technology Improving Safety of Crowdfunding Platforms Functioning in the Context of the Protection of the Start-Up Investors in the Financial and Transport Sectors. *Journal of KONBiN*, 49(1), 313-330. <https://doi.org/10.2478/jok-2019-0016>
- Tufekci, S., & Young, D. B. (1987). Moments of the present worth of general probabilistic cash flows under random timing. *The Engineering Economist*, 32 (4), 303-336. <https://doi.org/10.1080/00137918708902971>
- Vochozka, M. (2016a). Practical Comparison of Results of Statistic Regression Analysis and Neural Network Regression Analysis. *Littera Scripta*, 9 (2), 156-168. Retrieved October 14, 2021, from <https://www.littera-scripta.com/wp-content/uploads/2019/05/Practical-Comparison-of-Results-of-Statistic-Regression-Analysis-and-Neural-Network-Regression-Analysis-1.pdf>
- Vochozka, M. (2016b). Using neural networks to determine the financial plan. *Innovation Management, Entrepreneurship and Corporate Sustainability (IMECS)*, 742-755.
- Vrbka, J., Šuleř, P., Machová, V., & Horák, J. (2019). Considering seasonal fluctuations in equalizing time series by means of artificial neural networks for predicting development of USA and People's Republic of China trade balance. *Littera Scripta*, 12 (2), 178-192. Retrieved October 14, 2021, from <https://www.littera-scripta.com/wp-content/uploads/2020/01/Cel%C3%A9-bez-doi-1.pdf>
- Wang, L. (2019). Financial distress prediction for listed enterprises using Fuzzy C-Means. *Littera Scripta*, 12 (1), 169-177. Retrieved October 14, 2021, from https://www.littera-scripta.com/wp-content/uploads/2020/03/Wang_Littera_Scripta-citace-1form-%C4%8D%C3%ADsla-str%C3%A1nek.pdf
- Woju, U. W., & Balu, A. S. (2020). Fuzzy uncertainty and its applications in reinforced concrete structures. *Journal of Engineering Design and Technology*, 18 (5), 1175-1191. <https://doi.org/10.1108/JEDT-10-2019-0281>
- Zadeh, L. A. (1965). Fuzzy sets. *Information and Control*, 8 (3), 338-383. [https://doi.org/10.1016/S0019-9958\(65\)90241-X](https://doi.org/10.1016/S0019-9958(65)90241-X)
- Zadeh, L. A. (1983). The role of fuzzy logic in the management of uncertainty in expert systems. *Fuzzy Sets and Systems*, 11 (1-3), 199-227. [https://doi.org/10.1016/S0165-0114\(83\)80081-5](https://doi.org/10.1016/S0165-0114(83)80081-5)
- Zinn, C. D., Lesso, W. G., & Motazed, B. A. (1977). Probabilistic approach to risk analysis in capital investment projects. *The Engineering Economist*, 22 (4), 239-260. <https://doi.org/10.1080/00137917708965183>

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THE EFFECT OF INSTITUTIONAL INNOVATIONS ON TOURISM SPENDING IN DEVELOPED COUNTRIES *

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Abstract. The new institutional economy deals with the study of innovations that can be reflected in various national sectors, including tourism. The objective of the presented study was to evaluate the significance of the effects of institutional innovations on tourism spending. The analyses included data from databases of the World Travel & Tourism Council (business tourism spending (BTS), leisure tourism spending (LTS), domestic tourism spending (DTS) and visitor exports (foreign spending) (VEFS)) and the Global Innovation Index reports published by Cornell University, INSEAD and WIPO (political environment, regulatory environment, business environment) from 2010 to 2019 for 36 OECD countries (excluding Colombia). Panel regression models (pooling, fixed, random) adjusted by robust estimation were used for analytical processing. The findings indicate that LTS was the category with the highest spending and BTS was the category with the lowest spending. One of the most important findings is that institutional innovations in the business environment have the greatest effect on tourism spending. It can be concluded that with an increase in innovations in the business environment, an increase in BTS, LTS and VEFS can be expected. In the political and regulatory environments, it is not possible to talk about demonstrable effects in general.

Keywords: tourism; innovation; expenditure; political environment; regulatory environment; business environment

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1. Introduction

Institutional economics is similar to standard neoclassical economics, it emphasizes the importance of markets, competition and limited resources. However, unlike neoclassical economics, institutional economics assumes that people have imperfect information, limited mental abilities, and that they are exposed to uncertainties and risks in their transactions. In order to reduce risk and costs, people create rules, contracts, and standards (Shu-ping and Xiao-meng, 2017).

One of the authors who has emphasized on the significance of institutions and institutional change in the development and performance of economies was Douglas C. North in his book 'Institutions, Institutional Change and Economic Performance'. He defined institutions as the rules of the game in a society, or, more formally, the humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social or economic (North, 1990). Among the fundamental sources of long-run economic development, differences among institutions and the institutional change have received considerable attention in recent years (Law & Azman-Saini, 2012; Rybáček, 2018).

Innovation is the output of the innovation process and represents the realization of an invention (Vokoun, 2019). Hjalager (2002) divided the innovations as follows: production innovations, classical process innovations, process innovations of information handling, management innovations and institutional innovations. The last ones are the subject of our research.

2. Literature Review

As found by Huang et al. (2019) institutional configurations in the tourism sector have received a lot of attention from the political economy perspective, which views institutions as the power relations that govern the interactions of stakeholders influencing tourism policy decisions. This finding is also supported by authors such as Beritelli and Laesser (2011), Moscardo (2011), Nyaupane and Timothy (2010). Kim et al. (2018) argue that increases in institutional quality reduce transaction costs and risks faced by both suppliers of international tourist services and tourists.

As described further in the Material and Methods section, the institutional innovations are examined through the approach of the Global Innovation Index (GII), namely the first pillar of its innovation input sub-index that consists of political environment, regulatory environment and business environment (Cornell University, INSEAD & WIPO, 2020b).

First, we focus on the political and regulatory environment. Researchers who argue against government regulations often do so from the neoclassical economic assumption that markets are always superior (Weitzman, 1974; Diaz et al., 2020). The neoclassical economic theories have contributed to a better understanding of tourism, but alternative economic perspectives such as new institutional economics will help to extend the boundaries of our knowledge (Song et al., 2012). In reality, public-sector planners do not have absolute control, since tourism is largely a demand-driven activity, where markets seek destinations and activities to satisfy their wants and needs (McKercher, 1999; Majerová and Fernandez, 2020), but there is a space to control and influence the tourist market. Or, as McKercher (1999) also found out, that each tourism model argues that tourism can be controlled. It also means that at odds with neo-classical theories, there should be some interaction. The choice of policy approach and regulatory framework rests on two fundamental factors: that government decisions should be based on good sound knowledge and that this knowledge should be above politics (Dredge, 2017). Political stability is a basic element of the political environment. We have found Das and Dirienzo's (2010) study as the

first to analyse the impact of corruption on tourism adopting an economic perspective. Likewise, Saha et al. (2017) examined that the civil liberties and economic freedom were positively associated with inbound tourism. From the point of view of the issue of country stability and tourism, a research in this area has been conducted by Causevic and Lynch (2013) who investigated the influence after the political instability in Bosnia and Herzegovina on the tourism development. As expected, they suggested reconsidering the administration and governance introduced to address political conflict in the country as it failed to achieve collaboration between divided communities. But another interesting finding was that the tourism industry appeared to be ahead of other sectors in encouraging partnership between sides previously in conflict. Similar results have been found by Liu and Pratt (2017) when examining the security risk through the instability caused by terrorism. Their main finding was that from a global view, this kind of security risk does not have an adverse impact on tourism demand in the long run. On the other hand, the political motives for controlling tourism are usually very strong, if they are subtle, it is because governments do not want to overly release statements and information about their hidden political agendas (Nyaupane & Timothy, 2010). The study performed by Mosedale (2010) extended the economic analyses of institutions studies in reducing the uncertainty and transaction cost for the tourism sector by adopting a broader perspective on the quality of governance institutions. This perspective views governance quality as broadly defined by the effectiveness of the government in policy formulation, the ability to formulate and implement sound policies and regulations and the ability to promote norms in the society to obey the rules, fulfil the contracts and minimize the violence (Huang et al., 2019). Therefore, it can be assumed that the regulatory environment is another component of institutional innovations that could affect tourism.

We also focus on the business environment. Looking at the business environment from a broader perspective, it can be said that the business environment could be recognized as the various phenomena owing to the organization control, which embraces a series of resources and actors that influence the forms, management, and fate of enterprises (Duncan, 1972; Machová and Vochozka, 2019; Vochozka et al., 2020a). Among other business effects, Gani and Cledes (2020) showed that a country's domestic business environment can influence trade in services, such as attracting visitors for business purposes. Their research was based on the hypothesis that countries engaged in easing the process of business formation will attract international investors, resulting in the establishment of more businesses. It can be postulated that it is like a closed circle, if business environment affects the tourism sector (Gani & Cledes, 2020), the tourism sector affects the economic growth (Min et al., 2016; Sequeira & Nunes, 2008; Song et al., 2012), the economic growth affects the business environment in the meaning of institutional innovations (that is our idea of further investigation in the tourism sector). In this context, Sul et al. (2020) stated that the tourism-related business environment significantly affects destination competitiveness from visitor amounts and travel spending. The spending is the item to be examined in this study. Also interesting for research are innovations that respond to local and regional conditions due to climate change, weather, manifestations of negative impacts of human activity on the environment, and public health, which affect in particular the perception of the quality of the environment for recreational tourism (Kirschenstein et al., 2020; Vorobyeva et al., 2020; Nechaj et al., 2019).

Some recent researchers concluded that determining the main factors affecting the business environment of tourism is conducive to maintaining the continuous business benefits and tourism growth (Morant-Martínez et al., 2019; Zhu et al., 2020). Tourism demand is predominantly measured by the number of arrivals and the level of tourist spending (receipts), along with their variations, in per capita terms (Song et al., 2010). Tourism is also related to innovations in the business environment for sustainable and safe transport (Kelemen et al., 2018), resp. within the municipality of management in the Smart approach to mobility and transport at the local and regional level, and safety management education also for the support of business and recreational tourism (Kelemen & Jevcak, 2018).

According to the definition of the World Travel and Tourism Council, tourism relates to the activity of travellers on trips outside their usual environment with a duration of less than one year. We look at the tourism spending

related to all aspects of such trips. In this study, the effect of institutional innovations on tourism spending is examined through the spending in business tourism, domestic tourism, leisure tourism, outbound tourism (outbound travel), inbound tourism (visitor exports).

There are many kinds of business tourism: individual trips, group trips, displacements at events (Meetings, Incentives, Conventions, Exhibitions – MICE), team building and training trips (Nicula & Elena, 2014). Business tourism represents a growing segment of the international tourism market and it is considered as one of most desirable forms of tourism development at destinations worldwide (Dragicevic et al., 2012; Rogerson, 2015). Also, this is the reason why it needs innovations, to keep up with the trend. For example, the authors Dragicevic et al. (2012) pointed to the case of Vojvodina that even if it might become a competitive business tourism destination, some innovations are needed.

Domestic tourism continues to be the largest part of worldwide travel spend (as in 2019 it was 71.3%), continues to support opportunities by spreading development and regional economic benefits and building national pride (based on the data from WTTC, 2020b). Also, Massidda and Etzo (2012) concluded that comparing domestic tourism with international flows, it is prevalent in most countries in terms of its economic contribution and also in terms of size.

We have to distinguish ‘leisure’ and ‘leisure tourism’, where leisure is just a spending of free time and travel is the distinguishing mark (Graburn, 1989). The authors Min et al. (2016) have made an empirical study, which resulted in the findings that leisure tourism contributes to economic growth, but only at an early stage of economic development, its contribution becomes weaker as the economy develops. A leisure tourism also strongly depends on the seasonality, as Zheng and Zhang (2013) discovered in their study, the third quarter is the most favourable leisure tourism season. These results of seasonality are in accordance with the statements of Sheldon and Var (1985) and refute the exclusion of seasonality by the authors Nomani (1998) and Hong et al. (1996).

The outbound tourism spending can be affected by various factors. Some of the authors (such as Gozgor & Demir, 2018; Vietze, 2011) examined the macroeconomic perspectives and identified the following factors: economic factors, institutional quality (such as civil rights, political stability, effective governance, the level of corruption and freedom to speak), sociological factors and tourism information. The institutional quality factor gives an assumption to examine the effect of institutional innovations on tourism.

Inbound tourism is an opposite of outbound tourism. The determinants of inbound tourism are examined in several studies. Some authors identified the potential uncertainty sources affecting tourism development such as conflicts, political instability, security, and terrorism (Ghaderi et al., 2017; Saha & Yap, 2014; Saha et al., 2017; Ganjour et al. 2020; Rebhun, 2021; Vorobeva & Dana, 2021). But the economists dealing with tourism mostly use market demand theory analysing the demand and spending (Demir et al., 2019). Combining these two views should be interesting.

The issues discussed above and explored further in the article are not very widely developed in scientific studies. In any case, institutional innovations play an important role in the economy. Nevertheless, a lack of research efforts can be observed in examining the effects of institutional innovations in various areas of economic life, including tourism as a key sector of the economy. This issue has not been sufficiently examined and research is needed to fill this gap.

Vochozka et al. (2019) effectively use artificial neural networks in connection with the future state of the world. Their learning ability, as well as more extensive nonlinear statistical modeling and the potential to process larger volumes of data is highly desirable (Vochozka, 2017; Kalinová, 2021; Vochozka et al., 2020b). The applicability

of neural networks can be included in complex economic areas (including tourism sector), which is next positive (Vrbka et al., 2019; Stehel et al., 2019). It can be said that neural networks are thus a great promise for the future as a broad-spectrum analytical tool with a short-term prediction rate, as stated by Rousek and Mareček (2019), Rowland et al. (2021) and others.

3. Methodology, Variables and Data Collection

As is clear from the well-known theory, tourists' spending, which is translated into the revenues of tourism businesses, make a significant contribution to the national economy. Also, spending can be taken into account in terms of the predictor of economic development; and therefore, this key element should not be overlooked in research. The research effort in this study is focused on demonstrating the effects of institutional innovations on tourism spending.

Accordingly, the main objective of the presented study was to evaluate the significance of the effects of institutional innovations on tourism spending. Secondary data were used to achieve this objective. These data can be divided into two groups, namely the data on institutional innovations and the data on tourism spending. Data determining institutional innovations were obtained from the Global Innovation Index report (from 2011 to 2020) published by Cornell University, INSEAD and WIPO (2020a), these were the individual GII sub-indices presented below. The Global Innovation Index report has been published since 2007 (1st edition), but the first versions did not contain a sufficient number of countries and the methodology was also developing. For this reason, data from reports published in 2011 (4th edition) and later were used in this research. It should be noted that these data were assigned to the data on tourism spending with a one-year lag (i.e. the data on institutional innovations from 2011 were assigned to the data on tourism spending from 2010). In terms of the research focus of this study, three indicators were included as independent variables, namely the political environment (Political), the regulatory environment (Regulatory) and the business environment (Business). These indicators are measured by an index that can take theoretical values from 0 to 100. In Global Innovation Index report, the political environment consists of two indices: (1) the index of political, legal, operational or security risk, which replaces the indicator of political stability and safety indicator, reflecting more on the likelihood and severity of political, legal, operational or security risks affecting business operations; (2) the index representing the quality of public and civil services, policy formulation, and implementation. The regulatory environment is based on three indices focused on: (1) capturing perceptions on the government's ability to formulate and implement coherent policies to support private sector development of the private sector; (2) evaluating the extent to which the rule of law prevails (e.g. contract enforcement, property rights, police, courts); (3) evaluating the cost of redundancy dismissal as the sum, in wage weeks, of the cost of advance notice requirements added to severance payments due when terminating a redundant worker. The business environment includes two aspects that directly affect private entrepreneurial endeavours by using the World Bank indices on the ease of starting a business and the ease of resolving insolvency (based on the recovery rate recorded as the cents on the dollar recouped by creditors through reorganization, liquidation, or debt enforcement/foreclosure proceedings (Cornell University, INSEAD & WIPO, 2020b).

The second group of variables was represented by tourism spending. These data were obtained from the World Travel & Tourism Council (WTTC, 2020a) database, while the oldest data were from 2010 and the most recent from 2019. Specifically, the analytical processing included: (1) business tourism spending (BTS) that consists of spending on business activities in a country by domestic residents and foreign visitors; (2) leisure tourism spending (LTS) that consists of spending on leisure travel in a country by domestic residents and foreign visitors; (3) domestic tourism spending (DTS) that consists of domestic residents' spending on business and leisure activities in a country; and (4) visitor exports (foreign spending) (VEFS) that consist of foreign visitors' spending on business and leisure activities in a country, including spending on transport, but excluding international spending on education (WTTC, 2020a). The World Travel & Tourism Council provides only raw data (in billions

(1 000 000 000) USD per country), and for this reason an adjustment was necessary. In the first step, the individual variables were converted per capita. Population data were obtained from the Organization for Economic Co-operation and Development (OECD) database (OECD, 2020). The subsequent data adjustment consisted in reducing differences in purchasing power and prices. The variable Purchasing Power Parities for gross domestic product (GDP) per capita in current PPPs (index for OECD countries, OECD average = 1) was obtained from the OECD.stat database (OECD, 2020), and this variable was used to recalculate (by division) the indicators of tourism spending. In the final form, the variables on tourism spending were: USD per capita in real prices adjusted by Purchasing Power Parities for GDP per capita volume indices Current_PPPs.

The data were collected for 36 selected OECD countries, while Columbia was excluded due to its short OECD membership and its characteristics as a developed country may be questionable. Despite this fact, the primary exclusion criterion was its short membership.

Given the main objective, in which proving the significance of the effects of institutional innovations on selected tourism spending in developed countries plays a major role, regression analysis was chosen as the most appropriate analytical tool. The data themselves were formed by OECD countries ($n = 36$) and the years 2010–2019 ($T = 10$), suggesting a balanced panel. The panel regression analysis consisted of three models (one-way individual pooling model, one-way individual fixed (within) effect model, one-way individual random effect model: Swamy-Arora's transformation (Swamy & Arora, 1972)). A robust estimation was considered the most appropriate for analytical processing after evaluating the assumptions (the F test for the presence of individual effects (or time effect), the Hausman test for panel models, the Breusch-Pagan test, the Wooldridge test for unobserved individual effects (Wooldridge, 2010), the Baltagi and Li one-sided LM test (Baltagi & Li, 1995)). The pooling model was estimated using the heteroskedasticity-consistent covariance matrix estimation. The Arellano estimation method (Arellano, 1987) was applied for the fixed model, and the random model was estimated by the White 2 estimator. For completeness, it should be noted that these models always included only one independent variable. In addition to the above-mentioned procedures, it is possible to find a basic statistical description of variables in the following section. Also, outliers were identified by the Hampel test (Hawkins, 1980), which was selected with respect to the analysed data. These outliers were removed and subsequently imputed by the multiple imputation by chained equations (Azur et al., 2011). The programming language R (R Core Team 2020), v. 4.0.2 was used for analytical processing in R Studio – Rstudio, Inc., Boston, MA, U.S.

4. Results and Discussion

This section is focused on the analytical processing presented above, and it is divided into two consecutive parts. The first part offers a basic statistical description of variables. This part aims to create an idea of the inputs to subsequent analyses. Subsequently, in the second part, a regression analysis was used to evaluate the significance of the effects of institutional innovations on tourism spending. At the beginning of this part is an assessment of the assumptions of selected regression models, which are provided in the last part of the analytical processing.

Table 1 provides the results of the descriptive analysis of all variables entering the analyses. In total, the data included 360 observations (36 countries and 10 years). When focusing on the average values of indicators of institutional innovations, these values can be interpreted as relatively high. The highest value can be seen in the regulatory environment (Regulatory: Mean = 82.67; 95 % CI = 81.5–83.9; 5% TM = 83.30; Median = 84.1), and the other two indicators of institutional innovations lag behind minimally. When comparing the mean and 5% trimmed mean TM , it cannot be concluded that there were significant outliers, which is also supported by the comparison of the mean values and the median values in these indicators. The skewness and the kurtosis show minimal deviations from the normal distribution, while the largest deviations are evident in the business environment indicator (Business: Skew = -1.15; Kurt = 1.92). Looking at the standard deviations, the values of the

indicators of institutional innovations differed from each other the least in the indicator of the business environment (Business: SD = 9.13) and the most in the indicator of the regulatory environment (Political: SD = 12.6). The sample consisted of developed countries and the minimum values appear to be surprising and non-standard (Min: Political = 37; Regulatory = 48.2; Business = 40), as higher values were expected due to the degree of development. The maximum values are close to the theoretical maximum (100), which can be considered positive. With a focus on the indicators of tourism spending, the LTS indicator acquired the highest value of central tendencies (Mean = 2099.25; 95 % CI = 1964.8–2233.7; 5% TM = 1384.76; Median = 1368.64). The DTS indicator showed the smallest deviations from the normal distribution (Skew = 0.63; Kurt = -0.35). The lowest values were measured in the BTS indicator (Mean = 522.47; 95 % CI = 486.3–558.7; 5% TM = 488.55; Median = 492.41), in which the second largest deviations from the normal distribution are also evident (Skew = 2.45; Kurt = 10.72). The largest deviations from the normal distribution were identified in the VEFS indicator (Skew = 3.34; Kurt = 15.72). Basic information on the average values of the given indicators in the individual analysed countries is presented in the Table 2. Based on this information, it is possible to assess specific countries.

Table 1. Descriptive analysis of variables before data imputation

Variable N = 360	Mean	95% CI	5% TM	Median	SD	Min	Max	Skew	Kurt
Political	79.28	78.0–80.6	80.18	80.35	12.6	37	99.5	-0.99	0.77
Regulatory	82.67	81.5–83.9	83.3	84.1	11.53	48.2	99.7	-0.59	-0.33
Business	80.68	79.7–81.6	81.34	82.15	9.13	40	97.8	-1.15	1.92
BTS	522.47	486.3–558.7	488.55	492.41	349.25	112.99	2599.15	2.45	10.72
LTS	2099.25	1964.8–2233.7	1964.41	1824.11	1297.32	454.76	8863.93	2.14	7.14
DTS	1430.18	1342.1–1518.3	1384.76	1368.64	849.94	197.53	3851.9	0.63	-0.35
VEFS	1191.53	1075.68–1307.39	1047.80	838.12	1117.75	66.97	8322.97	3.34	15.72

Note: Mean – arithmetic mean; 95 % CI – 95 % confidence interval for mean; 5 % TM – trimmed mean; SD – standard deviation, Min – minimum; Max – maximum; Skew – skewness; Kurt – kurtosis

Table 2. Mean values of indicators in individual countries for the analysed period (2010–2019)

Country	Political	Regulatory	Business	BTS	LTS	DTS	VEFS
Australia	86.43	93.57	87.29	547.34	2651.46	2550.98	647.82
Austria	88.41	94.17	77.28	579.98	3503.43	2098.14	1985.27
Belgium	82.21	83.70	85.12	429.60	<u>1208.42</u>	752.54	885.48
Canada	90.30	94.54	92.26	662.11	<u>1110.19</u>	1382.25	390.05
Chile	<u>74.37</u>	<u>75.06</u>	<u>72.56</u>	<u>268.64</u>	1444.86	1393.81	<u>319.69</u>
Czech Republic	79.41	76.66	<u>74.10</u>	274.56	<u>1178.54</u>	<u>600.24</u>	852.86
Denmark	91.39	96.02	90.33	949.99	1504.86	1381.31	1073.55
Estonia	78.50	85.45	77.31	667.23	2123.44	718.95	2071.71
Finland	95.03	95.17	90.26	787.44	2050.94	2082.33	756.05
France	78.48	85.02	79.21	494.49	2049.79	1703.98	840.30
Germany	86.30	81.94	81.68	616.66	2944.88	3067.31	<u>494.24</u>
Greece	<u>59.33</u>	<u>69.39</u>	<u>70.46</u>	<u>231.90</u>	3356.29	1405.75	2182.45
Hungary	<u>70.37</u>	77.06	<u>70.38</u>	<u>136.50</u>	<u>1220.84</u>	<u>391.91</u>	965.42
Iceland	85.37	87.88	85.44	1833.72	7018.31	2941.74	5910.28
Ireland	84.92	90.80	90.11	610.72	1354.30	<u>445.54</u>	1519.49
Israel	<u>62.16</u>	<u>70.44</u>	78.35	330.36	1637.96	951.53	1016.79
Italy	<u>65.96</u>	78.64	<u>74.88</u>	610.95	2487.39	2358.97	739.37
Japan	86.57	89.58	81.97	598.45	<u>1228.51</u>	1616.64	<u>210.31</u>
Korea	<u>72.95</u>	<u>68.82</u>	87.93	<u>180.41</u>	<u>721.94</u>	<u>491.10</u>	<u>411.25</u>
Latvia	<u>72.37</u>	80.77	77.29	<u>273.65</u>	1359.09	<u>689.50</u>	943.24
Lithuania	76.28	<u>72.57</u>	<u>72.98</u>	<u>251.93</u>	<u>900.14</u>	<u>489.91</u>	662.17
Luxembourg	92.26	82.92	<u>73.31</u>	<u>186.15</u>	3725.33	<u>697.66</u>	3213.83

Mexico	<u>47.86</u>	<u>57.60</u>	76.15	<u>156.94</u>	2553.49	2390.34	<u>320.09</u>
Netherlands	90.58	93.07	87.53	435.95	1254.94	880.26	810.64
New Zealand	93.61	98.17	88.08	1065.99	4683.47	3556.52	2192.94
Norway	93.13	94.67	89.78	583.46	1817.94	1689.36	712.04
Poland	74.52	<u>74.54</u>	<u>73.10</u>	<u>179.68</u>	<u>484.20</u>	<u>213.45</u>	<u>450.43</u>
Portugal	79.15	<u>72.79</u>	83.67	533.56	2890.42	1205.31	2218.67
Slovak Republic	76.49	<u>73.02</u>	<u>74.01</u>	367.06	<u>887.14</u>	<u>636.98</u>	617.23
Slovenia	75.05	79.99	83.10	394.69	2235.95	907.75	1722.89
Spain	<u>71.44</u>	76.82	76.61	372.28	2798.03	1414.81	1755.51
Sweden	91.48	91.30	84.43	906.23	1888.79	1730.99	1064.03
Switzerland	94.79	94.84	77.64	517.46	2884.63	1938.44	1463.64
Turkey	<u>45.71</u>	<u>54.57</u>	<u>64.05</u>	<u>138.51</u>	<u>853.28</u>	<u>451.38</u>	<u>540.41</u>
United Kingdom	80.15	94.62	88.56	909.18	1905.99	2319.83	<u>495.34</u>
United States	80.61	89.85	87.24	725.06	1653.84	1939.12	<u>439.78</u>

Note: The ten highest values in each category are highlighted in 'bold' and the ten lowest values are highlighted in 'underline'.

Based on the descriptive analysis, some discrepancies in the data could be expected. For further analytical processes, it was therefore appropriate to eliminate these discrepancies. These were mainly deviations in the form of increased kurtosis and skewness. The application of the Hampel test revealed the presence of outliers (N: Political = 4; Regulatory = 0; Business = 5; BTS = 7; LTS = 14; DTS = 0; VEFS = 26). The identified outliers were removed and subsequently imputed using the multivariate imputation by chained equations technique.

Table 3. Descriptive analysis of variables after data imputation

Variable	Mean	95% CI	5% TM	Median	SD	Min	Max	Skew	Kurt
Political	79.33	78.05–80.62	80.18	80.35	12.43	43.5	99.5	-0.92	0.52
Regulatory	82.67	81.47–83.86	83.3	84.1	11.53	48.2	99.7	-0.59	-0.33
Business	81.12	80.27–81.97	81.55	82.25	8.19	56.8	97.8	-0.68	-0.06
BTS	498.58	471.03–526.13	485.66	489.01	265.81	112.99	1294.95	0.56	-0.37
LTS	2005.42	1901.5–2109.34	1952.37	1824.11	1002.65	454.76	5780.35	0.78	0.06
DTS	1430.18	1342.09–1518.28	1384.76	1368.64	849.94	197.53	3851.9	0.63	-0.35
VEFS	1044.84	977.72–1111.96	1017.26	835.11	647.61	66.97	2468.1	0.74	-0.69

Note: Mean – arithmetic mean; 95 % CI – 95 % confidence interval for mean; 5 % TM – trimmed mean; SD – standard deviation, Min – minimum; Max – maximum; Skew – skewness; Kurt – kurtosis

Table 3 shows the results of descriptive analysis performed on the analysed data after the adjustment (removal of outliers and subsequent imputation of the data). It is possible to observe an increase in central tendencies in the indicators of institutional innovation and, conversely, a decrease in indicators of tourism spending. In the case of adjusted data, the position of skewness and kurtosis is acceptable.

Table 4. Assumptions of panel regression models

Model	F Test (effect) countries	F Test (effect) years	Hausman test (fixed– random)	Wooldridge test (unobserved effects)	Baltagi-Li one-sided LM test	Breusch- Pagan test
Political→BTS	96.01†	1.17	46.61†	3.56†	10.1†	18.86†
Political→LTS	133.78†	0.61	0.58	4.01†	5.98†	1.85
Political→DTS	473.04†	0.35	8.05***	3.82†	14.29†	0.12
Political→VEFS	115.26†	0.8	0.3	4.19†	9.26†	1.83
Regulatory→BTS	69.16†	1.46	187.14†	3.73†	10.03†	14.21†
Regulatory→LTS	130.88†	0.57	1.95	4.02†	5.12†	0.44
Regulatory→DTS	413.65†	0.41	79.53†	3.53†	14.56†	0.28
Regulatory→VEFS	115.33†	0.71	0.88	4.11†	8.30†	1.35
Business→BTS	101.67†	1.44	12.67†	3.57†	9.64†	6.4**
Business→LTS	143.66†	0.41	0.02	3.83†	4.01†	0.1
Business→DTS	462.95†	0.28	4.33**	3.76†	14.03†	3.68*
Business→VEFS	121.43†	0.68	0.38	4.18†	7.65†	0.86

Note: * p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01; † p-value < 0.001

Table 4 shows the results of testing the assumptions that affect the preference of the regression model (Table 5). The first and second columns provide the results of the F Test for individual and/or time effects. The first column assesses the individual effects of the panel variable characterizing each country. This test compared the pooling (Ordinary Least Square – OLS) model and the fixed (effect) panel model. Obviously, the output appears to be significant in all of the analysed cases, which means that the individual effect of each country was significant. The F test verifying the effect of years shows insignificant results in all cases. Based on the above-mentioned, it is clear that the panel model with the panel variable country was more suitable than the pooling model. The third column shows the output of correlated effects analysis.

For this purpose, the Hausman test was chosen, which evaluated the effects as significantly correlated in half of the analysed cases (Political→BTS: 46.61†; Political→DTS: 8.05***; Regulatory→BTS: 187.14†; Regulatory→DTS: 79.53†; Business→BTS: 12.67†; Business→DTS: 4.33**). In these cases, the fixed (effect) model appeared to be more appropriate than the random (effect) model.

The serial correlation was assessed by the Wooldridge test for unobserved individual effects and the Baltagi-Li one-sided LM test, and it is clear that there was a significant correlation in all of the analysed cases. This result can be considered as negative and a robust estimation approach seems to be appropriate for the solution of this shortcoming. In the last column, the constancy of the variability of residues is assessed. This assumption was not met in four cases (Political→BTS: 18.86†; Regulatory→BTS: 14.21†; Business→BTS: 6.4**; Business→DTS: 3.68*), as the presence of heteroscedasticity is evident in these cases. Based on these deviations, a robust approach to estimates was chosen.

Table 5. Regression analysis results

Model	Coef	Pooling (SE) ^a	Fixed (SE) ^b	Random (SE) ^c
Political→BTS	β	12.65†(8.41:16.89)		1.03(-3.44:5.51)
	α	-497.33***(-807.10:-187.56)	-1.21(-4.09:1.68)	424.55***(68.42:780.67)
Political→LTS	β	13.64(-11.50:38.78)		0.85(-14.38:16.09)
	α	876.92(-1,124.36:2,878.20)	-0.95(-15.51:13.61)	1,891.59*** (650.10:3,133.09)
Political→DTS	β	17.56(-5.390:40.41)		-4.74***(-8.30:-1.18)
	α	37.33(-1,800.51:1,875.18)	-5.28*(-10.74:0.19)	1,806.16†(1,417.47:2,194.86)
Political→VEFS	β	8.2(-6.32:22.72)		0.97(-10.38:12.33)
	α	363.36(-785.20:1,511.92)	-0.25(-13.61:13.11)	936.83***(21.22:1,852.45)
Regulatory→BTS	β	16.65†(12.64:20.66)		3.31†(1.39:5.24)
	α	-869.87†(-1,179.11:-560.62)	0.32(-2.33:2.98)	232.43*** (75.01:389.85)
Regulatory→LTS	β	17.76(-7.80:43.32)		0.52(-6.44:7.48)
	α	491.43(-1,642.46:2,625.32)	-1.54(-13.23:10.15)	1,916.40†(1,274.57:2,558.22)
Regulatory→DTS	β	29.30***(5.91:52.69)		-0.13(-3.54:3.28)
	α	-991.8(-2,953.08:969.48)	-0.81(-5.11:3.50)	1,440.61†(1,067.52:1,813.71)
Regulatory→VEFS	β	7.28(-7.69:22.24)		-0.49(-5.20:4.21)
	α	412.47(-826.92:1,651.86)	-1.57(-9.56:6.41)	1,054.76†(631.09:1,478.43)
Business→BTS	β	18.15†(11.93:24.37)		2.54†(1.40:3.68)
	α	-966.28†(-1,440.20:-492.35)	1.74***(0.13:3.34)	300.30†(193.30:407.29)
Business→LTS	β	2.61(-27.37:32.59)		9.31†(4.88:13.73)
	α	1,747.50(-748.30:4,243.30)	9.52*** (3.67:15.37)	1,204.24†(743.50:1,664.98)
Business→DTS	β	28.73***(5.53:51.93)		3.91*** (1.51:6.30)
	α	-900.88(-2,738.58:936.82)	3.75(-0.85:8.35)	1,113.27†(786.59:1,439.96)
Business→VEFS	β	-3.94(-22.37:14.49)		5.30†(2.26:8.34)
	α	1,333.74*(-209.78:2,877.27)	5.66*** (1.89:9.44)	584.00†(276.28:891.71)

Note: a – Robust estimation; b – Arellano estimator; c – White 2 estimator

* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01; † p-value < 0.001

Table 5 provides the results of the regression analysis. In the analysed case of Political→BTS, it is possible to confirm the significance only when using the pooling model ($\beta = 12.65^\dagger$), neither the fixed model nor the random model showed significant coefficients for this case. Given the assumptions in Table 4, the fixed and random models in Table 5 are more relevant compared to the pooling model. On this basis, the effect of the political environment on business tourism spending (Political→BTS) cannot be considered significant. A similar result can be observed for Regulatory→DTS (β : Pooling = 29.30**; Fixed = -0.81; Random = -0.13). With a focus on the analysed cases of Political→LTS, Political→VEFS, Regulatory→LTS, and Regulatory→VEFS, there was no significant coefficient in any model. For Regulatory→BTS, a significance can be confirmed for both the pooling model ($\beta = 16.65^\dagger$) and the random model ($\beta = 3.31^\dagger$), while the fixed model ($\beta = 0.32$) appears to be the most appropriate based on the assumptions (Table 4). On the other hand, there was no significance in this model. Again, a similar result can be observed in the case of Business→DTS. The most valuable results can be found in Business→BTS (β : Pooling = 18.15†; Fixed = 1.74**; Random = 2.54†), Business→LTS (β : Pooling = 2.61; Fixed = 9.52***; Random = 9.31†), and Business→VEFS (β : Pooling = -3.94; Fixed = 5.66***; Random = 5.30†). In these cases, it is recommended to prefer the use of the fixed model (Business→BTS) and the random model (Business→LTS, Business→VEFS) instead of the pooling model. All significant effects showed positive β coefficients with the exception of Political→DTS (in which the significance was only at the level of $\alpha = 0.1$ when using the most appropriate fixed model).

Discussion

Tourism is constantly adapting to changing institutional conditions, which are reflected in the political, regulatory and business environment. At the same time, the tourism sector is an important part of the economies, as evidenced by the fact that this sector contributed to the global economy GDP by 10,3% in 2019 (WTTC, 2020b). For this reason, the role of institutional innovations in tourism should be addressed.

In general, it is well known that institutions are important for the national level of innovation in developed countries (Bunda et al., 2014). According to Kim et al. (2018), countries that are able to achieve higher quality of governance institutions are more attractive to international tourists, which can be reflected in higher revenues from them. In this sense, institutional innovations in the political, regulatory and business environment are considered important in tourism. From a political point of view, many authors agree that greater stability in countries generally leads to higher tourism development (Bayar & Yener, 2019; Lee & Chen, 2020; Liu & Pratt, 2017); therefore, political instability, conflicts, security, and terrorism should not be overlooked (Causevic & Lynch, 2013; Ghaderi et al., 2017; Liu & Pratt, 2017; Saha & Yap, 2014; Saha et al., 2017). From another perspective, Kim et al. (2018) highlighted regulatory quality and the rule of law as the characteristics of governance with a greater effect on international flows in tourism, and these authors revealed that the effect of improving institutional quality on tourism is stronger in high-income countries than in emerging economies. In addition to the mentioned, Gani and Cledes (2020) confirmed that business infrastructure is associated with foreign business visitors, while the authors emphasized that open trade policies, together with improving the business environment, play an important role in this area. Dragicevic et al. (2012) also pointed to investments and improvements in the planning and development of tourism products as a potential source of a competitive business tourism destination. Simultaneously, destination competitiveness is associated with the number of tourism visitors and tourism spending (Dwyer et al., 2003; Tsai et al., 2009). Based on all these findings, it can be noted that innovations in the political, regulatory and business environment are very welcome, but these findings do not clarify the effect of institutional innovations in tourism.

The presented study fills this research gap in terms of tourism spending. In general, this study provides evidence of the significant effects of institutional innovations on tourism spending. From a specific point of view, the most significant effects were observed in the case of institutional innovations in the business environment. In this context, significant and positive effects on business tourism spending, leisure tourism spending and visitor exports (foreign spending) were confirmed. This fact means that, with an increase in the rating of institutional innovations in the business environment, an increase in the mentioned spending can be expected, which is positive for the analysed economies. In the case of institutional innovations in the political and regulatory environment, no significant and positive effects were demonstrated. Despite this fact, our findings confirm that institutional quality and innovations remain a key aspect in developed countries and their specific sectors, as generally emphasized by Egan (2013), who analysed this issue in developing countries, or by Liedong et al. (2020), who examined emerging markets. Our results can build on the findings of Vietze (2011), who emphasized the importance of 'good' institutions in a country in terms of international tourism spending. The author has clearly confirmed that a high level of civil rights, political stability, effective governance, low corruption and a high level of freedom are important factors in this issue. In terms of the presented research, institutional innovations can have a positive effect on the tourism sector as a driver of economic performance.

The findings also indicate that leisure tourism spending was the category with the highest spending and business tourism spending was the category with lowest spending. Nevertheless, Moll-de-Alba et al. (2016) revealed that the daily spending of business tourists is significantly higher compared to leisure tourists. These authors also found a shorter length of stay for business tourists, which may be reflected in their overall contribution to tourism spending. At the same time, it should be noted that business tourism is a less represented area in this sector (Ibanescu et al., 2018). With a focus on the individual analysed countries, Iceland and New Zealand dominated

among other countries in terms of tourism spending. Countries such as Canada, Denmark, Finland, the Netherlands, New Zealand and Norway can be considered positive in terms of institutional innovations. The efforts devoted to institutional innovations in the business environment are considered very effective in countries such as Turkey, Hungary, Chile, Lithuania, Poland and the Slovak Republic. According to the ideas of β convergence, these are countries with a lower level of development in the business environment; therefore, it is very likely that positive changes will also have a positive effect on tourism spending.

Conclusion

The doubts about the importance of the research efforts on tourism spending can be easily dispelled. Given the economic power contained in national economy metrics, initiatives describing the relations with tourism spending are at least beneficial. The objective of the presented study was to evaluate the significance of the effects of institutional innovations (represented by innovations in the political, regulatory and business environment) on tourism spending (represented by business tourism spending, leisure tourism spending, domestic tourism spending and visitor exports).

Panel models were used to estimate the effects, as it was shown that the effects of countries could not be ignored. In future similar research projects, it is recommended to prefer the use of country-based models over the simple estimation techniques (which have been shown to lead to distorted and often diametrically different conclusions).

One of the most important findings of the study is that institutional innovations in the business environment have a positive effect on tourism spending. The effect was found in terms of business tourism spending, leisure tourism spending and visitor exports (foreign spending). On this basis, it can be concluded that innovations in the business environment can lead to an increase in tourism spending in these categories. In the political and regulatory environments, it is not possible to talk about demonstrable effects in general.

These findings underline the fact that the attention of policy makers and strategic plan makers should be focused on institutional innovations in the business environment, in particular in the areas of the ease of starting a business and the ease of resolving insolvency. Improvements in these areas can lead to the support and revitalization of the tourism sector in terms of tourism spending. Tourism spending is reflected in the revenues of tourism businesses, which mean a significant contribution to the national economy. Strategic planners should know what affects tourism spending at both the political and practical levels, and institutional innovations play an important role. This issue is even more important at a time when tourism is hard hit by the COVID-19 pandemic, while the tourism sector is considered to be one of the main drivers of the economy. For this reason, it is recommended to remove institutional barriers for tourism businesses and to make progress at the institutional level. The presented study also emphasizes the need for research into institutional innovations in various sectors of the national economy in developed countries, as this issue is not sufficiently examined and it could offer valuable information to policy makers seeking to achieve the required economic performance.

One of the dominant limitations can be identified in the data of institutional innovations themselves. These are represented by a sub-index of GII and they consist of several indicators collected from third-party databases, usually collected with a certain time lag. However, in general, the GII is considered to be a relevant source of information; therefore, the limitation in question is not expected to affect the results significantly. A potential source of limitations is that the results can be generalized only to developed countries, it can be assumed that the results may be different in countries with a lower degree of development. Further research ambitions in this area will be focused on the examination of relations in the context of other types of innovations. It would also be quite interesting to compare countries with a lower level of development.

References

- Arellano, M. 1987. Computing robust standard errors for within-groups estimators. *Oxford bulletin of Economics and Statistics*, 49(4), 431–434.
- Azur, M. J., Stuart, A. E., Frangakis, C., & Leaf, P. J. 2011. Multiple imputation by chained equations: What is it and how does it work?. *International Journal of Methods in Psychiatric Research*, 20(1), 40–49. <https://doi.org/10.1002/mpr.329>
- Baltagi, B. H., & Li, Q. 1995. Testing AR(1) against MA(1) disturbances in an error component model. *Journal of Econometrics*, 68(1), 133–151. [https://doi.org/10.1016/0304-4076\(94\)01646-H](https://doi.org/10.1016/0304-4076(94)01646-H)
- Bayar, Y., & Yener, B. 2019. Political stability and tourism sector development in Mediterranean countries: A panel cointegration and causality analysis. *European Journal of Tourism Research*, 21, 23–32.
- Beritelli, P., & Laesser, C. 2011. Power dimensions and influence reputation in tourist destinations: Empirical evidence from a network of actors and stakeholders. *Tourism Management*, 32(6), 1299–1309. <https://doi.org/10.1016/j.tourman.2010.12.010>
- Bunda, N. R., Spataru, E. C., & Popovici, N. 2014. The institutional framework and innovation levels in EU countries. *Transformations in Business & Economics*, 13(3C), 584–601.
- Causevic, S., & Lynch, P. 2013. Political (in)stability and its influence on tourism development. *Tourism Management*, 34, 145–157. <https://doi.org/10.1016/j.tourman.2012.04.006>
- Cornell University, INSEAD, & WIPO. 2020a. *About the Global Innovation Index*. Retrieved December 5, 2020, from <https://www.globalinnovationindex.org/about-gii#reports>
- Cornell University, INSEAD, & WIPO. 2020b. *The Global Innovation Index 2020: Who will finance innovation?* Ithaca, Fontainebleau, and Geneva.
- Das, J., & Dirienzo, C. 2010. Tourism competitiveness and corruption: A cross-country analysis. *Tourism Economics*, 16(3), 477–492. <https://doi.org/10.5367/000000010792278392>
- Demir, E., Gozgor, G., & Paramati, S. R. 2019. Do geopolitical risks matter for inbound tourism? *Eurasian Business Review*, 9(2), 183–191. <https://doi.org/10.1007/s40821-019-00118-9>
- Diaz, R., Pardo, P., Teixeira, N., & Machová, V. 2020. Financial market integration of ASEAN-5 with China. *Littera Scripta*, 13(1), 46–63. https://doi.org/10.36708/Littera_Scripta2020/1/4
- Dragicevic, V., Jovicic, D., Blesic, I., Stankov, U., & Boskovic, D. 2012. Business tourism destination competitiveness: A case of Vojvodina province (Serbia). *Economic Research-Ekonomska Istraživanja*, 25(2), 311–331. <https://doi.org/10.1080/1331677X.2012.11517510>
- Dredge, D. 2017. Policy and regulatory challenges in the tourism collaborative economy. In: Dredge, D., Gyimóthy, S. (Eds.) *Collaborative Economy and Tourism*. Tourism on the Verge. Cham, Switzerland: Springer. https://doi.org/10.1007/978-3-319-51799-5_6
- Duncan, R. G. 1972. Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly*, 17(3), 313–327. <https://doi.org/10.2307/2392145>
- Dwyer, L., Livaic, Z., & Mellor, R. 2003. Competitiveness of Australia as a tourism destination. *Journal of Hospitality and Tourism Management*, 10(1), 60–78.
- Egan, P. J. W. 2013. R&D in the periphery? Foreign direct investment, innovation, and institutional quality in developing countries. *Business and Politics*, 15(1), 1–32. <https://doi.org/10.1515/bap-2012-0038>
- Gani, A., & Clemes, M. D. 2020. Business environment effect on business visitor arrivals to New Zealand. *Current Issues in Tourism*. <https://doi.org/10.1080/13683500.2020.1835841>
- Ganjour, O., Widmer, E. D., Viry, G., Gauthier, J.-A., Kaufmann, V., & Drevon, G. (2020). Understanding the Reconstruction of Personal Networks Through Residential Trajectories. *Migration Letters*, 17(5), 621–638. <https://doi.org/10.33182/ml.v17i5.694>
- Ghaderi, Z., Saboori, B., & Khoshkam, M. 2017. Does security matter in tourism demand? *Current Issues in Tourism*, 20(6), 552–565. <https://doi.org/10.1080/13683500.2016.1161603>
- Gozgor, G., & Demir, E. 2018. The effects of economic policy uncertainty on outbound travel expenditures. *Journal of Competitiveness*, 10(3), 5–15. <https://doi.org/10.7441/joc.2018.03.01>
- Graburn, N. H. H. 1989. Tourism: The sacred journey. In: Smith, V. L. (Eds.) *Hosts and Guests: The Anthropology of Tourism*. Philadelphia, Pennsylvania: The University of Pennsylvania Press.
- Hawkins, D. M. (1980). *Identification of outliers*. Dordrecht, Netherlands: Springer. <https://doi.org/10.1007/978-94-015-3994-4>
- Hjalager, A. M. 2002. Repairing innovation defectiveness in tourism. *Tourism Management*, 23(5), 465–474. [https://doi.org/10.1016/S0261-5177\(02\)00013-4](https://doi.org/10.1016/S0261-5177(02)00013-4)
- Hong, G., Morrison, A. M., & Cai, L. A. 1996. Household expenditure patterns for tourism products and services. *Journal of Travel & Tourism Marketing*, 4(4), 15–40. https://doi.org/10.1300/J073v04n04_02
- Huang, Q., Li, X. Y., Jia, X. J., & Li, H. 2019. Global hospitality growth and institutional quality. *Journal of Hospitality and Tourism Management*, 41, 117–128. <https://doi.org/10.1016/j.jhtm.2019.10.008>
- Ibanescu, B. C., Stoleriu, O. M., & Gheorghiu, A. 2018. Gender differences in tourism behaviour in the European Union. *Eastern Journal of European Studies*, 9(1), 23–43.
- Kalinová, E. 2021. Artificial intelligence for cluster analysis: case study of transport companies in Czech republic. *Journal of Risk and Financial Management*, 14(9). <https://doi.org/10.3390/jrfm14090411>

- Kelemen, M., & Jevčák, J. 2018. Security Management Education and Training of Critical Infrastructure Sectors' Experts. *2018 XIII International Scientific Conference - New Trends in Aviation Development (NTAD)*, 2018, pp. 68-71. <https://doi.org/10.1109/NTAD.2018.8551687>.
- Kelemen, M., Szabo, S., & Vajdová, I. 2018. *Security Management in the Air Transport: Example of an Interdisciplinary Investigation of Special Security Questions*. Challenges to national defence in contemporary geopolitical situation 2018 (2018), no. 1, 105-108. <https://doi.org/10.47459/cndcgs.2018.15>
- Kim, Y. R., Saha, S., Vertinsky, I., & Park, C. 2018. The impact of national institutional quality on international tourism inflows: A cross-country evidence. *Tourism Analysis*, 23(4), 533–551. <https://doi.org/10.3727/108354218X15391984820503>
- Kirschenstein, M., Krasuski, K., Kozuba, J., & Kelemen, M. 2020. Assessment of the Variability of Many Years of Thunderstorm Activity in the Aspect of Potential Threats to Aircraft at Selected Airports in Poland. *Int. J. Environ. Res. Public Health* 2020, 17, 144. <https://doi.org/10.3390/ijerph17010144>
- Law, S. H., & Azman-Saini, W. N. W. 2012. Institutional quality, governance, and financial development. *Economics of Governance*, 13(3), 217–236. <https://doi.org/10.1007/s10101-012-0112-z>
- Lee, C. C., & Chen, M. P. 2020. Do country risks matter for tourism development? International evidence. *Journal of Travel Research*. <https://doi.org/10.1177/0047287520954539>
- Liedong, T. A., Peprah, A. A., Amartey, A. O., & Rajwani, T. 2020. Institutional voids and firms' resource commitment in emerging markets: A review and future research agenda. *Journal of International Management*, 26(3), 100756. <https://doi.org/10.1016/j.intman.2020.100756>
- Liu, A. Y., & Pratt, S. H. 2017. Tourism's vulnerability and resilience to terrorism. *Tourism Management*, 60, 404–417. <https://doi.org/10.1016/j.tourman.2017.01.001>
- Machová, V., & Vochozka, M. 2019. Analysis of business companies based on artificial neural networks. *SHS Web of Conferences: Innovative Economic Symposium 2018 - Milestones and Trends of World Economy (IES)*, 61. <https://doi.org/10.1051/shsconf/20196101013>
- Majerová, J., & Fernandez, C. 2020. How to make phoenix to arise from the ashes: brand loyalty as a prospective pillar of branding in tourism after crisis COVID-19. *Littera Scripta*, 13(2), 49–58. https://doi.org/10.36708/Littera_Scripta2020/2/5
- Moll-de-Alba, J., Prats, L., & Coromina, L. 2016. The need to adapt to travel expenditure patterns. A study comparing business and leisure tourists in Barcelona. *Eurasian Business Review*, 6(2), 253–267. <https://doi.org/10.1007/s40821-016-0046-4>
- Massidda, C., & Etzo, I. (2012). The determinants of Italian domestic tourism: A panel data analysis. *Tourism Management*, 33(3), 603–610. <https://doi.org/10.1016/j.tourman.2011.06.017>
- McKercher, B. 1999. A chaos approach to tourism. *Tourism Management*, 20(4), 425–434. [https://doi.org/10.1016/S0261-5177\(99\)00008-4](https://doi.org/10.1016/S0261-5177(99)00008-4)
- Min, C., Roh, T., & Bak, S. 2016. Growth effects of leisure tourism and the level of economic development. *Applied Economics*, 48(1), 7–17. <https://doi.org/10.1080/00036846.2015.1073838>
- Morant-Martínez, O., Santandreu-Mascarell, C., Canós-Darós, L., & Roig, J. M. 2019. Ecosystem model proposal in the tourism sector to enhance sustainable competitiveness. *Sustainability*, 11(23), 6652. <https://doi.org/10.3390/su11236652>
- Moscardo, G. 2011. Exploring social representations of tourism planning: Issues for governance. *Journal of Sustainable Tourism*, 19(4–5), 423–436. <https://doi.org/10.1080/09669582.2011.558625>
- Mosedale, J. 2010. Political economy of tourism: Regulation theory, institutions, and governance networks. In: Lew, A. A., Hall, C. M., Williams, A. M. (Eds.) *The Wiley Blackwell Companion to Tourism*. Chichester, United Kingdom: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118474648.ch4>
- Nechaj, P., Gaál, L., Bartok, J., Vorobyeva, O., Gera, M., Kelemen, M., & Polishchuk, V. 2019. Monitoring of Low-Level Wind Shear by Ground-based 3D Lidar for Increased Flight Safety, Protection of Human Lives and Health. *Int. J. Environ. Res. Public Health* 2019, 16, 4584. <https://doi.org/10.3390/ijerph16224584>
- Nicula, V., & Elena, P. R. 2014. Business tourism market developments. *Procedia Economics and Finance*, 16, 703–712. [https://doi.org/10.1016/S2212-5671\(14\)00858-2](https://doi.org/10.1016/S2212-5671(14)00858-2)
- Nomani, A. Q. 1998. Vacationers rewriting the travel calendar by taking time off throughout the year. *The Wall Street Journal*.
- North, D. C. 1990. *Institutions, institutional change and economic performance*. New York, United States: Cambridge University Press. <https://doi.org/10.1017/CBO9780511808678>
- Nyaupane, G. P., & Timothy, D. J. (2010). Power, regionalism and tourism policy in Bhutan. *Annals of Tourism Research*, 37(4), 969–988. <https://doi.org/10.1016/j.annals.2010.03.006>
- OECD. 2020. *OECD.Stat*. Retrieved December 5, 2020, from <https://stats.oecd.org/>
- R Core Team. 2020. R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing. Retrieved December 5, 2020, from <https://www.R-project.org/>
- Rebhun, U. 2021. Inter-country variations in COVID-19 incidence from a social science perspective. *Migration Letters*, 18(4), 413–423. <https://doi.org/10.33182/ml.v18i4.1254>
- Rogerson, C. M. 2015. Unpacking business tourism mobilities in sub-Saharan Africa. *Current Issues in Tourism*, 18(1), 44–56. <https://doi.org/10.1080/13683500.2014.898619>
- Rousek, P., & Mareček, J. 2019. Use of neural networks for predicting development of USA export to China taking into account time series seasonality. *Ad Alta-Journal of Interdisciplinary Research*, 9(2), 299-304.

- Rowland, Z., Lazaroiu, G., & Podhorská, I. 2021. Use of neural networks to accommodate seasonal fluctuations when equalizing time series for the CZK/RMB exchange rate. *Risks*, 9(1). <https://doi.org/10.3390/risks9010001>
- Rybáček, Z. 2018. Size of government in empirical research: a case study from the Czech republic. *Littera Scripta*, 11(2), 141–154. http://journals.vstecb.cz/category/littera-scripta/11-rocnik-2018/2_2018/
- Saha, S., & Yap, G. 2014. The moderation effects of political instability and terrorism on tourism development: A cross-country panel analysis. *Journal of Travel Research*, 53(4), 509–521. <https://doi.org/10.1177/0047287513496472>
- Saha, S., Su, J., & Campbell, N. 2017. Does political and economic freedom matter for inbound tourism? A cross-national panel data estimation. *Journal of Travel Research*, 56(2), 221–234. <https://doi.org/10.1177/0047287515627028>
- Sequeira, T. N., & Nunes, P. M. 2008. Does tourism influence economic growth? A dynamic panel data approach. *Applied Economics*, 40(18), 2431–2441. <https://doi.org/10.1080/00036840600949520>
- Sheldon, P. J., & Var, T. 1985. Tourism forecasting: A review of empirical research. *Journal of Forecasting*, 4(2), 183–195. <https://doi.org/10.1002/for.3980040207>
- Shu-ping, W., & Xiao-meng, W. 2017. Relationships between exchange rates, economic growth and FDI in China: an empirical study based on the TVP-VAR model. *Littera Scripta*, 10(1), 166–179. <https://littera-scripta.com/relationships-between-exchange-rates-economic-growth-and-fdi-in-china-an-empirical-study-based-on-the-tvp-var-model/>
- Song, H., Dwyer, L., Li, G., & Cao, Z. 2012. Tourism economics research: A review and assessment. *Annals of Tourism Research*, 39(3), 1653–1682. <https://doi.org/10.1016/j.annals.2012.05.023>
- Song, H., Li, G., Witt, S. F., & Fei, B. 2010. Tourism demand modelling and forecasting: How should demand be measured? *Tourism Economics*, 16(1), 63–81. <https://doi.org/10.5367/000000010790872213>
- Stehel, V., Horák, J., & Vochozka, M. 2019. Prediction of institutional sector development and analysis of enterprises active in agriculture. *E & M Ekonomie a Management*, 22(4), 103–118. <https://doi.org/10.15240/tul/001/2019-4-007>
- Sul, H. K., Chi, X., & Han, H. 2020. Measurement development for tourism destination business environment and competitive advantages. *Sustainability*, 12(20), 8587. <https://doi.org/10.3390/su12208587>
- Swamy, P. A. V. B., & Arora, S. S. 1972. The exact finite sample properties of the estimators of coefficients in the error components regression models. *Econometrica*, 40(2), 261–275. <https://doi.org/10.2307/1909405>
- Tsai, H., Song, H., & Wong, K. K. F. 2009. Tourism and hotel competitiveness research. *Journal of Travel & Tourism Marketing*, 26(5–6), 522–546. <https://doi.org/10.1080/10548400903163079>
- Vietze, C. 2011. What's pushing international tourism expenditures? *Tourism Economics*, 17(2), 237–260. <https://doi.org/10.5367/te.2011.0039>
- Vochozka, M. 2017. Formation of complex company evaluation method through neural networks based on the example of construction companies' collection. *Ad Alta-Journal of Interdisciplinary Research*, 7(2), 232–239.
- Vochozka, M., Horák, K., & Krulický, T. 2020b. Innovations in management forecast: time development of stock prices with neural networks. *Marketing and Management of Innovations*, 2, 324–339. <https://doi.org/10.21272/mmi.2020.2-24>
- Vochozka, M., Horák, J., & Šuleř, P. 2019. Equalizing seasonal time series using artificial neural networks in predicting the Euro–Yuan exchange rate. *Journal of Risk and Financial Management*, 12(76). <https://doi.org/10.3390/jrfm12020076>
- Vochozka, M., Vrbka, J., & Šuleř, P. 2020a. Bankruptcy or success? The effective prediction of a company's financial development using LSTM. *Sustainability*, 12(18). <https://doi.org/10.3390/su12187529>
- Vokoun, M. 2019. Organizational innovation activities in the czech manufacturing sector in 2014. *Littera Scripta*, 12(1), 1–13. <https://littera-scripta.com/littera-scripta-2019-volume-12/>
- Vorobyeva, O., Bartok, J., Šišán, P., Nechaj, P., Gera, M., Kelemen, M.; Polishchuk, V., & Gaál, L. 2020. Assessing the Contribution of Data Mining Methods to Avoid Aircraft Run-Off from the Runway to Increase the Safety and Reduce the Negative Environmental Impacts. *Int. J. Environ. Res. Public Health* 2020, 17, 796. <https://doi.org/10.3390/ijerph17030796>
- Vorobeve, E., & Dana, L.-P. 2021. The COVID-19 pandemic and migrant entrepreneurship: Responses to the market shock. *Migration Letters*, 18(4), 477–485. <https://doi.org/10.33182/ml.v18i4.1400>
- Vrbka J., Nica, E., & Podhorská, I. 2019. The application of Kohonen networks for identification of leaders in the trade sector in Czechia. *Equilibrium-Quarterly Journal of Economics and Economic Policy*, 14(4), 739–761. <https://doi.org/10.24136/eq.2019.034>
- Weitzman, M. L. 1974. Prices vs. quantities. *The Review of Economic Studies*, 41(4), 477–491. <https://doi.org/10.2307/2296698>
- Wooldridge, J. M. 2010. *Econometric analysis of cross-section and panel data*. London, United Kingdom: The MIT Press.
- WTTC. 2020a. *Tourism expenditure*. Retrieved December 5, 2020, from <https://tool.wttc.org/>
- WTTC. 2020b. *Travel and tourism global economic impact & trends 2020*. London, United Kingdom: WTTC. Retrieved December 5, 2020, from <https://wttc.org/Research/Economic-Impact/moduleId/1445/itemId/91/controller/DownloadRequest/action/QuickDownload>
- Zheng, B., & Zhang, Y. 2013. Household expenditures for leisure tourism in the USA, 1996 and 2006. *International Journal of Tourism Research*, 15(2), 197–208. <https://doi.org/10.1002/jtr.880>
- Zhu, L., Zhan, L., & Li, S. 2020. Is sustainable development reasonable for tourism destinations? An empirical study of the relationship between environmental competitiveness and tourism growth. *Sustainable Development*, 1–13. <https://doi.org/10.1002/sd.2131>

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ON SOCIETAL SECURITY OF THE STATE: APPLYING A PERSPECTIVE OF SUSTAINABILITY TO IMMIGRATION*

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Abstract. The article focuses on how immigration can pose a threat for the receiving countries in a societal context. To theoretically cover this, the lenses of the Copenhagen School's theoretical frameworks such as securitization and security sector division are used to put statistical data to practice with the help of analytical and quantitative-comparative method. In the second part of the article, the specific examples of potential threats to the native society are presented, such as demographic crisis of the European Union (which is not a threat related to immigration in itself, but rather a catalyst for the potential threats) and the lower performance of immigrants on the labour market. In the last part, the article deals with the potential of making the migration sustainable through analysis of different understandings of such concept. As seen, international migration in today's intensity is unsustainable and brings practical and political consequences which can be avoided only through effective immigration and asylum policies, which tend to be overlooked in nowadays climate. Society is polarised in this subject and divides people into those who want almost no border controls as opposed to those who want the borders closed. None of these alternatives are valid and concept of sustainable migration could prove to be the viable middle ground so very much needed in this debate.

Keywords: security; society; international migration; immigration; sustainability; security threat

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1. Introduction

Mankind had been migrating since their beginning as a race, but a concept of international migration started only with nations and as they emerged, a differentiation between native and foreign people began. To a certain extent, people were always divided even before the concept of state, but it was never as legitimate as in such institutionally complex unit as state. Special state departments were built and policies designed in order to regulate conditions applied to people from “outside“. The reason was quite simple: states knew that letting foreign people into their borders had a lot of various connotations in relation to economy, security and even society and left uncontrolled – it could potentially pose a threat. Nowadays, international migration is a frequently discussed topic, as migration from developing countries to developed countries is so significant it started to polarise society into those, who welcome immigrants with open arms with no regards to potential negative impacts and vice versa, those who are strongly opposed to foreigners and see only threats and costs (Chlebny 2018). As we see it, neither of these alternatives are healthy for the state’s and its citizens’ wellbeing. Thus, the goal of this article is to take a nonpartisan perspective through the lenses of various theoretical concepts and with emphasis on the society as an essential building unit of a state.

As immigration is surely a by-product of globalization, its deepening is contributory to the cumulation of various economic and political problems (Ivančík 2019). Our main subject of interest is a society threatened by immigration and as such, we are going to apply securitization theory and security sector division theory of the Copenhagen School to understand how society can actually be threatened and in what manner, since “a threat” does not need to be necessarily of a military nature (Marini, Chokani, Abhari 2019). In the first part, we will also define how we understand terms such as security threat, security risk or vulnerability, since these are the necessary basics for a security analysis. In the second part, we will illustrate a few examples of how can an excessive immigration have a negative impact on the social cohesion within the receiving state and what challenges face societies of today in regard to immigration. In the third part we are going to elaborate on the concept of sustainable migration as an alternative and a sort of middle ground between open door and closed door policy which are debated on the grounds of either public or political discourse.

2. Theoretical framework

As the Copenhagen School stems from the theoretical basis of social constructivism and social constructivism is an inherently relativist concept, we consider defining of pivotal terms in this area essential for our article to be comprehensible. If we’re discussing *societal sector*, we are using a term coined by the aforementioned Copenhagen School (or at least in the security context) which stems from their concept of securitization, or rather an overally new approach towards understanding of security. What Buzan and his colleagues basically did was that they viewed the security relations between the threat and the threatened from both perspectives and relativized them. They went even deeper and didn’t acknowledge only state actors as threatened but even individuals, or non-human entities such as environment, economy, or social structures in society. When suddenly the number of “threatened“ significantly rose, a need for compartmentalization emerged: hence the 5 security sectors being military, environmental, economic, political and societal one. With all these sectors, they managed to cover essentially every threat and threatened entity that one could think of by subsuming it to one of the

security areas and by applying the so-called securitization theory and a kind of a “speech-act“, as they call it.

According to Buzan et al., the “speech-act“ should fulfill three rhetoric criteria and it is a discursive process by means of which the actor a) states, that the *referent object* is existentially threatened, b) demands a right to take extraordinary measures to deal with the threat and c) persuades the public, that the behaviour which breaks rules in order to face the threat is justified and legitimate (Buzan, Wæver, de Wilde 1998). To mark something as a “security issue“ we are putting an added gravity upon the issue and a main priority. Therefore, securitization could be perceived as a process through means of which the unpoliticized (those which aren’t discussed) or politicized (those which are discussed) issues promoted to security issues, which are needed to be dealt with urgently and this fact legitimizes circumvention of public discussion and democratic procedures (Van Munster 2012). Essentially, we could built up a spectrum, or rather an axis of prioritized issues: the least urgent are unpoliticized issues. A state doesn’t act and takes no interest. When it comes to the politicized issues, a state starts to take interest and acts. Finally, securitized issues are top priority and a state will do everything in its competence to resolve them. The main point of the whole theory is that any public issue could be securitized into the security issue, even though it has no military character whatsoever. And there comes the relativity: a certain security issue is not objective, but subjective in its nature and has a different impact on a different actor in the whole process meaning that, for instance should the oil prices go significantly up, it would pose an existential threat towards the (most obviously the economic one, although we definitely could find intersections even to other security sectors) sector of less developed recipients, not the oil powers. A brain drain is also a brain gain for the goal state: an outflow of educated people could pose a threat to several sectors of the home state, yet for the receiving ones it is a positive phenomenon. This is incidental to the aforementioned *referent object*, which is one of the components of the securitization discursive process. As we mentioned, a *referent object* is an entity, which happens to be under an existential threat. The other two key components are *securitising actors* and *functional actors*. The *securitising actors* are the ones declaring the *referent object* as existentially threatened and by doing so, they are the ones directly moving the securitization process. *Functional actors*, on the other hand, are a bit more complicated category. They are affecting the dynamics of the security relations in a particular sector and while the political decisions in the security field are influenced by them significantly, they do not have characteristics of neither *referent objects* nor *securitising actors* who actually would point out the necessity of security action in relation towards this object. Buzan et al. give a befitting example of *functional actors*: in the context of environmental sector of security it could be a company which is polluting the environment. It is not the object under an existential threat, nor it points out the need to securitize the subject, yet it significantly adds up to the security equation (Buzan, Wæver, de Wilde 1998). And again, these three roles could be relativized based on the taken perspective.

Before we start with the sector analysis, there is a need for even further defining as the terms „threat“ and „risk“ are oftentimes interchanged, thought to be one and the same thing or misunderstood completely and we cannot possibly hope to define them without also first defining „vulnerability“. We daresay that in security studies, knowledge of these words is as essential as the knowledge of the securitization theory itself. *Referent object* is a basal component of these words and as such, it is whose existence we are trying to ensure, whereas *threat* is anything, that could take the advantage of a *vulnerability* and, be it intentionally or coincidentally, endanger or even erase the existence of said *referent object*. The mentioned *vulnerability* is essentially a weak point or an opportunity for a *threat* to

be exploited in order to get access to *referent object's* existence. Finally, a *risk* is, to a certain extent, a combination of all said terms above: we can define it as a potential for a possible destruction or damaging of a *referent object* as a result of successful *threat* exploitation of a *vulnerability* (Threat Analysis Group 2021).

Now, the focus of this article lies in the societal sector. According to Copenhagen School, there are quite a few recurring casual topics within the context of this sector and one of them is migration, which is described as a situation when a certain bundle of persons is overloaded or disrupted by the influx of persons from the second bundle which results in the fact that the community of the first bundle is not going to be as before, since the said population will be formed by different people and by means of which the identity of the first bundle is being changed (Buzan, Wæver, de Wilde 1998). There are two situations in which this interchange may eventually result in. The first one is a *horizontal competition* which represents a situation when despite the fact that persons of the first bundle are still living on a certain territory, due to the growing and overwhelming cultural and linguistic influence of the persons of the second bundle, the persons of the first bundle are forced to change their way of life. On the other hand, there is also a *vertical competition* which portrays a reality, in which the people stop perceiving themselves as a community of the first bundle due to the foundation of a certain integration unit, or project (such as Yugoslavia, or European Union), or due to the influence of a certain separatist project (e.g. Catalonia, or Quebec). These are forcing the persons towards either more inclusive or more exclusive perception of their own identity. Interesting, and somewhat relating to the former is a situation of *population decline*, not natural however, but on account of epidemic, war, natural disaster, or controlled genocide, because in this case the population decline would also mean a decline of people identifying with a very specific identity which would consequently threaten its existence. This is nonetheless debatable since there is a need to differentiate between a threat towards a society and a threat towards an individual inside of said society (Buzan, Wæver, de Wilde 1998).

So the societal sector, same as any other sector, covers a plethora of different risks, threats and scenarios coinciding with social coherence and cohesion, which are no less integral to the wellbeing of the state than for example healthy economy or peace. One could say that society is a basic building unit of the state and should society be malfunctioning in its nature, then even other areas of the state will be affected. In the following part of the article, we are going to present a few of the dimensions, or rather fields that could prove to be threatening towards the states targeted by immigration.

3. Threatened society of today

First of all, it's needless to say, that the threats are seldom sector specific – exclusive for one sector and for this sector only. As was mentioned before, we could always find intersections. There is, however, always one sector that is predominant in the matter.

Securitized topics rely on the perspective and for the purpose of this article we are going to look from the perspective of European Union (EU) member states. When discussing sustainability of society, under no circumstances can we omit the decreasing demographic curve of the EU. The estimates of Eurostat say, that from the demographic dividend, which had been positive for at least 40 years, is expected a decline for another 40 years – a negative curve (Reuters Graphics 2019). For instance, population of Germany should decrease from the contemporary circa 83 million to 74 million by 2050,

whereas the age median (in 1960 being 35 years) increased in 2013 to 45,3 years, in case of Italy it was 32 in 1960, and 44,4 in 2013 (Reuters Graphics 2019). These numbers add up even for other states such as Spain (from 30 to 41,3 years), Sweden (from 36 to 40,9), Great Britain (at that time still being a part of European Union, from 36 to 39,8) or Poland (from 26 to 38,7) (Reuters Graphics 2019). A similar trend could be seen in the context of age dependency. The contemporary expectation is that by 2050 there will be only two people in working age for each in retirement age and what's more, European Union in 2050 should stagnate on circa 500 million people, losing 49 million in working age (Boussemart, Godet 2017). Essentially, this means about 11 million potentially active workers less in Germany and about 7 to 8 million less in Spain and Italy – the declining trend, however, can't be applied globally – for instance, population of India should increase by 400 million people by 2050 (Boussemart, Godet 2017). Should we look on the numbers from World Population Prospects 2015, we can see that since 2015-2050, there is an estimated decline of people in Europe under 20 years by 8,4 million, in category 20-64 years its by 49,1 million, whereas an increase of people from 65 years and more by more than 51,2 million and what's more, out of this group around, 33,1 million will be 80 years old and more (UN – World Population Prospects 2015 Scenario Medium 2015). On the other hand, in the same time period the population of Africa should increase by 1,3 billion, out of which by 130 million only the population of northern Africa, which will inherently lead to greater migrational pressure on Europe, because even if only 1% of this African increase was to settle in e.g. France in the upcoming 30 years, it would mean a 13 million more people by 2050 (Boussemart, Godet 2017).

Immigrants have a great influence on the population of Europe (Carling, Erdal 2018, Eichler 2020). Even though the mortality rate in European Union was for the last couple of years higher than the natality rate, the population, in fact, rose in a one year's time due to net migration (Eurostat 2018). Population trends, however, are not consistent within European Union. While population of Malta, Luxembourg or Sweden increased rapidly, Lithuania, Croatia or Latvia rapidly decreased (Mohdin 2018). Further analysis, conducted by demographic research centre Population Europe found out that migration is actually the most essential factor when it comes to population increase in European countries. For Luxembourg, Cyprus, Malta, Spain, Austria or Sweden was migration a defining factor in context of population increase (Population Europe 2016, Mastilovic, Zoppi 2021). However, in certain countries, migration alone is not enough to make demographic curves even. In Italy, for example, a decreasing natality and increasing lifespan caused population to age drastically and while net migration helps, it is necessary to stimulate fertility, which decreased to its historical low (Mohdin 2018). A similar situation is typical for Germany, where population increased for the last couple of years due to the influx of migrants, but in a long-term perspective, not even the million refugees of 2015 can avert the demographic crisis of Germany (Mohdin 2018).

This is a textbook example of threat of a *horizontal competition* mentioned in the first part of the article. Should it continue at this pace, due to the significantly different demographic patterns at work in countries of destination and countries of origin there is a threat towards the collective identity of countries of destination and at this rate, the situation is unsustainable (Rigouste 2018).

To further elaborate on the sustainability, there is another issue, which is related to the demographic crisis, which has a potential to rise to various different implications. The issue in question is the lower performance of immigrants in numerous areas, such as labour market or education. To secure equivalent opportunities and rising social mobility for all should be an important goal for truly inclusive societies

(Kholodkovskii 2019). Immigrants and their children are one of the most vulnerable groups, since they tend to face a plenty of obstacles and are a part of population which constantly grows. In European Union, in country of destination the children of immigrants represent 9% of all young people from 15 to 34 years and 11% of all children under 15 and, at the same time, these children and youth tend to have lower achieved education and results on labour market than their peers with native-born parents, predominantly in those EU member-states, which noted an excessive immigration of people with low education (OECD 2017).

In EU, 15% of natives with parents born outside EU have mother with maximum of elementary education or no formal education at all, which suggests that these people have harder starting point in life, what may partially explain their lower performances in educational system and labour market and according to OECD the fact, whether immigrant mothers have a job has an important impact on the results of their children, more than in case of their peers with native parents (OECD 2017). In a lot of European countries children with low-educated immigrant parents have a lower probability of graduating high school and higher education in comparison with natives with the same low level of education and there we can see a convergence in acquiring education between generations. Intergenerational increased mobility between children of parents born in EU is high. Across all levels of parent education, adult descendants with parents born in EU have higher employment rate than with parents born outside of EU (Rodriguez 2017). The same goes for higher levels of parent education as they do not improve chances on the labour market for children of immigrants with lower education born outside of EU as well as they improve chances of children born to native parents – native children born to parents with low education who are born outside of EU have hardly the same opportunities to find employment as their peers with low-educated native-born parents and having parents with a completed higher secondary education increases employment rate for natives with native parents by 10%, whereas this increase is just 5% for peers with parents born outside EU and the same equation works for parents with high education (OECD 2017). In Europe, the difference in employment between native-born children of immigrants from countries outside EU and children of natives is decreased with the level of achieved education of these children, which suggests that education is a stronger incentive for integration to labour market among children of immigrant parents than among children of natives, since low-educated natives with low-educated parents born outside EU have a lower employment rate by 8% than their peers with native-born parents (OECD 2017).

An extent to which parents bring their human capital is a key factor affecting education and results at the labour market in later stages of life. Furthermore, in EU and Organization for Economic Cooperation and Development (OECD) member states, immigrants are represented on lower employment and work levels, mostly on the lowest, especially in European OECD member states, in EU it is 15% of natives with parents born outside EU, whose mother haven't finished formal education, which is 5-times the share between native-born mothers (OECD 2017). Not only are immigrant parents on the lower levels of education, they also have a lot higher probability of being unemployed and even when they are employed they are in less qualified vocations (OECD 2017).

The performances of immigrants - be it on labour market or in education - are not security threats in itself for the country of destination, rather for the social cohesion as they give ground for prejudice and discontent, they well may be more of a catalyst to threat (Stephen 2018). These are the first steps to alienation of immigrants and division to "them" and "us", which is a fertile environment for social

incoherence resulting in aversions and finally societal threats. It is our understanding that the core issue of this security risk lies not in the individual immigrants as persons, but in the intensity of the migration flows and as we cannot stop immigration (nor should we be prone towards this notion), the only way is to manage it in sustainable fashion.

4. The need for migration's sustainability

International migration is not something one can have an opinion on. It needs to be understood as a certain fact that is hardly changeable. With this said, there still is a need to manage it since – as we pointed out in the previous part – the migration in this intensity should prove unbearable in the future. However, as migration inherently is a human right, discussions about limiting, managing or in any way obstructing the opportunity of people to migrate in hope for a better life is a very sensitive subject prone to polarise (Young, Loebach, Korinek 2018). In this context, we consider the phenomenon of “sustainable migration” a matter of utmost importance as it contemplates both human rights and preservation side of the coin – both immigrants and the country of destination with its native society.

The concept of sustainable migration stands upon a very rational premise of costs and benefits that migration brings, which are essentially the positive and negative impacts brought about by the process. The word “process” is emphasized, considering that we shouldn't appoint the specific pros and cons solely to migrating persons, but rather to the whole reality of merging two (or more for that matter) sets of people together, as was indicated in the previous part. So the spectrum of the costs and benefits stems from the economic ones through social or political up to cultural and so on. Furthermore, researchers from the Peace Research Institute Oslo (PRIO) are asking a fundamental question: “for whom is the migration sustainable?” and apply a similar theoretical framework in analysing the topic as we did. Understanding of sustainable migration is substantial for the further policy development and as they state, when you try to develop a policy, you need to be aware of the different stakeholders' perception of the impacts, them being either benefits or costs (Erdal, Carling, Horst, Talleraas 2018).

We can define “sustainability” as “the ability to be maintained at certain rate or level”, or better yet “the ability to continue or be continued for a long time” (Oxford Learner's Dictionaries 2021). Therefore, the term sustainable migration insinuates a migration, that could be kept up indefinitely, without a withering influence on – since the relativity of the matter was correctly pointed out – either country of destination, country of origin, native society or immigrants themselves. To put it into our terms: it would no longer pose an existential threat to the referential object, which is – for the purposes of this article – the native society. Generally, however, it is a perspective oriented predominantly on the future as it tries to take into account even the long-term consequences, not necessarily only the immediate ones, even puts priority on them. Nowadays, the usual approach towards migration is that it's being promoted and the benefits being highlighted, but more realistic and constructive approach would be, as PRIO states, “to acknowledge that migration entails both costs and benefits to individuals and societies, and to address the distribution of those costs and benefits, now and in the future” (Erdal, Carling, Horst, Talleraas 2018). With all this considered, the four authors formulate a definition, which states that sustainable migration is a “migration that ensures a well-balanced distribution of costs and benefits for the individuals, societies and states affected, today and in the future” (Erdal, Carling, Horst, Talleraas 2018). As far as definitions go, they should be exact as much as possible and the word with certain vagueness to it in the definition is “well-balanced” as the interpretation of the word could vary. It is almost

impossible to put a universal example of just the right amount of migrational costs and benefits and it's not always as rational of a choice as it might seem. According to PRIO, there are two prerequisites for an effective way to build up relevant policies and it's "a sound understanding of the mechanisms that produce costs and benefits" on one hand and "a normative foundation for balancing potentially conflicting interests" at the other (Erdal, Carling, Horst, Talleraas 2018). This is very important to comprehend, since not every cost can be outweighed and not in every situation can state actually calculate and strive for better cost-benefit ratio. A catalyst for such situation is, for instance, a principle of non-refoulement[†] which when at play, there is no further reason on counting costs and benefits as there is no choice. However, there are scenarios in which the state's wellbeing can be actually dependent on the specific taken policy and the states should aim for the most favourable one in the specific circumstances. PRIO gives an example of situation when a "large-scale immigration of skilled manual workers can relieve labour market bottlenecks and stimulate economic activity, but at the same time erode hard-won labour standards and undermine recruitment to the trades in question" (Erdal, Carling, Horst, Talleraas 2018). So, for the state, it always comes to the dilemma and that is what we mean by calculation of the cost-benefit ratio. It is desirable for states to acknowledge, that migration impacts indeed are diverse and they should not be afraid to admit the reality that an ideal situation would be a migration scenario which is beneficial for the both sides. Not every is and should the situation be more costly than beneficial, then there is a need to reconsider. For costly migration, in its essence, is not sustainable and may prove to be a security threat.

As indicated above, there are several actors involved in the migration process, and although our primary interest is the recipient state and its society, we also consider it necessary to point out the ways in which the country of origin may be affected, whether in a positive or negative sense. However, when we talk explicitly about emigration, it is very difficult to summarize in any way its impact on the country of origin. There are too many changes and the multidisciplinary of migration issues is also a factor that makes it all difficult. In addition, the given variables are the characteristics of a given emigration, such as its type. Depending on whether it is labour migration, economic migration or refugees, the implications for the country of origin vary widely. Another important characteristic is the intensity of the given migration: in small numbers it is almost imperceptible, in large ones it is directly unsustainable. We can also mention the timing, directions of migration flows, specific characteristics of individuals, human capital, or the socio-political context in which the country of origin is present. Should we focus on labour migration the outflow of labour force is, of course, a basic category that comes to mind and is considered negative. This is true to some extent, but the relativity of this issue does not circumvent this area either, and remittances are an integral part of labour migration in the context of the country of origin. In fact, people of working age can be more beneficial in a low-income developing country by seizing the opportunity in a higher-income country and compensating their home country by sending remittances. In fact, remittances can make up a significant part of the GDP of many low-income countries. According to The World Bank data in 2017, remittances reached a record high of \$613 billion at the time, of which up to \$466 billion ended up in low- and middle-income countries (The World Bank 2018). The global coronavirus pandemic has partially disrupted the migration trends we are used to as many migrant workers who have worked abroad for a long time are returning home, but despite the prediction of remittances decrease which was significant, specifically estimated at 20% in 2020

[†] Principle based in international law forbidding states the readmission of refugees to their countries of citizenship should they face persecution or their life there would be endangered.

compared to 2019, the outcome was not so dire in the end (The World Bank 2020). Despite the pandemic, low- and middle-income countries ended up receiving remittances of up to \$540 billion in 2020, just 1.6% less than in 2019, when low- and middle-income countries received \$548 billion (The World Bank 2021). However, it should be noted that The World Bank reports can only record money that has passed through official or formal channels, so the real amount of remittances can be significantly higher, according to The World Bank somewhere between one third and one half of all remittances (Adams, 2003). Also, in many developing countries, remittances make up a huge part of total GDP. In Tajikistan, for example, in 2013, remittances from cheap, low-skilled labour working in countries such as Russia, Kazakhstan and Uzbekistan accounted for almost half of total GDP (Lemon 2019). Currently, the 9 countries that have the largest share of remittances in their GDP all have this value above 20% (The Global Economy 2021). However, the downside of labour migration lies in the brain drain, which is significant and unsustainable, especially in the context of developing countries. According to the International Organization for Migration (IOM), there are more African scientists and engineers in the United States at this time than in Africa as a whole (Conway-Smith, 2015) and several years ago, according to the IOM estimate, emigration from Africa accounted for the loss of \$9 billion in human capital and growth potential since 1997 due to the brain drain (Globalization 101 2018).

The overall perception of how migration affects countries, especially those receiving, has changed over the years. We can assume that public opinion has changed due to the intensity of migration flows. The generally optimistic view was dominant in the 1960s, deteriorating later in the 1970s, again at the turn of the millennium, the opinion turned positive, and today we can again see a general deterioration (Erdal, Carling, Horst, Talleraas, 2018). In this context, the example of the Federal Republic of Germany is also interesting, as it has a long tradition of migration flows to its territory and in 2015 there was still a generally positive opinion, even sympathy for migrants who filled unattractive job vacancies on the labour market for a long time. The beginning of the migration crisis in Germany was accompanied by various donations and contributions, civic engagement, voluntary initiatives, people offered refugees free German lessons and accommodation (Trines, 2017). However, it should be noted that Merkel's open door policy was not preferred by all Germans and the chancellor encountered an almost immediate decline in preferences (The Economist, 2015), and moreover, two years after the onset of the migration crisis, sentiment towards refugees began to turn rapidly negative and the then-open doors policy of the government was increasingly difficult to defend, mainly due to events such as the mass sexual assaults perpetrated by new immigrants during the New Year's Eve celebrations in 2015 or the terrorist attacks instigated by the Islamic State in 2016, many of which were perpetrated by asylum seekers (Trines 2017). Here we can see the polarization of society and the decline of social cohesion between individual members of society as a result of migration, the costs of which began to outweigh the benefits, has ceased to be only a security threat, but has become a reality. After a significant decline in political preferences and an increase in the preferences of anti-immigration and anti-Islamic political platforms, Angela Merkel eventually changed her policy and promised a ban on wearing burqas, and that the 2015 situation will not be repeated (Boreham, 2016). Also, after criticism over her pro-migration remarks at Davos, she proclaimed words of regret towards the previous management of the migration crisis saying "we were always proud of freedom of movement but we never really thought about protecting our external borders. Now we're working on our entry-exit system..." (Alexe, 2018).

In this regard, the literature suggests that various policies that affect the intensity of migration flows in some way have a significant impact on stimulating the cost-benefit ratio in favour of benefits. However,

restricting immigration is often difficult and impossible in the case of rightful refugees (as this would be contrary to international law) and it is therefore not surprising that most policies affecting migrants[‡] consider migration flows to be a matter of course and thus focus on getting as many benefits from the situation rather than apprehend the flows and influence them directly - as in the case of the trend of “labour export” policies of various developing countries, mainly in Asia (Erdal, Carling, Horst, Talleraas 2018).

Alexander Betts and Paul Collier, who wrote a parallel study on sustainable migration to researchers at PRIO, provide a partially different view of the topic. They recognize that migration can also be predominantly effective, for example when there are economic or even social and cultural benefits for both the destination and the countries of origin. Enterprises in Europe need workers and are still on the trend of relying directly on them. In the United Kingdom, employers face a 15% labour deficit after Brexit and, as mentioned above, many developing countries receive far more finances in remittances than in foreign direct investment, however, according to Betts and Collier, for other benefits to really outweigh the costs, migration must be sustainable (Betts, Collier, 2018). From their point of view, sustainable migration means the ability to withstand over time and the protection of advantageous migration, while eliminating the destabilizing consequences that are currently increasingly relevant to migration policies throughout Europe (Betts, Collier, 2018).

For example, at the beginning of the new millennium, the Scandinavian countries were characterized by their open, social and liberal governments, which strongly supported social inclusion and integration policies, had rich social support systems, liberal asylum policies and were generally textbook examples of welfare states (Roy 2018). However, as immigration rates significantly multiplied in 15 years, overly open immigration and asylum policies have begun to make welfare states effectively failing to actually provide “welfare” for all citizens because immigration management is so costly for the state budget that the government simply cannot afford it. In other words, if a welfare state is to be sustainable, immigration must also be sustainable. Opinions began to emerge that the concept of a welfare state was in direct conflict with an open immigration policy, and the Danish Social Democrats began to reconsider their approach to it. According to the Danish Ministry of Finance, immigration from third world countries costs the Danish treasury DKK 30 billion, or €4 billion, which is then missing from the budget for the central activities of the welfare state (Nedergaard, 2017). In their statement, the Social Democrats proclaim that “as Social Democrats we believe that we must help refugees, but we also need to be able to deliver results in Denmark via local authorities and for the citizens. For the Social Democratic Party, it is about finding the balance between helping people in need and ensuring the coherence of our country and continuing to be able to afford the high level of welfare provision that characterizes our society” (Nedergaard, 2017). In this statement, we can see a parallel to the concept of sustainable migration in the context of finding a balanced cost-benefit ratio, although this is not directly labelled such. They continue “we have therefore been tightening asylum rules and increased requirements for immigrants and refugees. And we will continue to pursue a tight and consistent asylum policy, which makes Denmark geared to handling refugee and migratory pressures” (Nedergaard, 2017). It is not just a promise as Denmark is the first country to revoke the status of more than 200 Syrian refugees in the spring of 2021,

[‡] We intentionally do not use the term “migration policies” as it can also subsume rules, which may positively or negatively affect the situations of migrant workers, or people with a migration background in general, but may not fall under the migration policy agenda.

arguing that several areas of Syria are no longer under direct threat and therefore there is no reason for Denmark to continue to provide protection (Murray 2021).

The example of Germany or Denmark shows, that states are actually sensing the threat and we can see them making a sort of precautions. The reason behind the change of Angela Merkel's or Danish Social Democrats' policies was not only the fiscal implications, but even the social and political ones. They realized that their preferences were plummeting, they saw the discontent of their own citizens and a rise of far-right subjects, criminality and even terrorism. These all are symptoms of absencing social cohesion. As such, we lean more closely towards the understanding of Betts and Collier, when they state that "migration must be acceptable to a large majority of citizens through the normal democratic process and meet the long-term self-interest of the receiving and sending societies and of migrants themselves" (Betts, Collier 2018). In the statement, they go beyond the definition of their Norwegian counterparts from PRIO as their understanding is more technocratic. Betts and Collier put a more societal point of view, when they understand sustainable migration as "migration that has the democratic support of the receiving society, meets the long-term interests of the receiving state, sending society, and migrants themselves, and fulfils basic ethical obligations" (Betts, Collier 2018). Societal aspect is absolutely integral for this concept to work and should we not take into account the need for migration to be maintained at sustainable level, with a regard to the receiving state's society, then said society's sustainability is in question.

Conclusions

The goal of this article was to elaborate on the security implications related to immigration mostly from the perspective of the receiving state. Based on the security sector division theory of Copenhagen School, our primary interest was the societal sector and how it could be potentially threatened by migratory flows or rather the collateral phenomena brought about with them.

When discussing topics such as migration, it is essential to understand the relativity of the subject. It depends highly on the taken perspective and thus it is only natural to apply securitization theory as an epitome of relativization and as such, we have put society of the receiving state to the role of a referent object or an entity that is under an existential threat within the societal sector of security. Needless to say, incoming immigrants do not necessarily need to pose a threat of physical harm, but from the societal perspective, there is a plethora of vulnerabilities to be exploited. As we didn't want to get distracted from the societal sector by turning our attention towards a political one (which has a lot in common considering threats and risks with the societal), we overlooked phenomena such as rise of far-right platforms or terrorism on purpose and focused solely on two clear societal challenges: demographic crisis of the European Union and the lower performance of immigrants on the labour market.

An impact of demographic crisis in relation to immigration has only secondary implication for the native society. That is, immigrants have no connection to the declining demographic patterns of European societies, in fact, they can prove to be a positive factor in various ways. However, the threat lies in what the Copenhagen School describes as horizontal competition, which means that due to the overwhelming cultural influence of foreign people, the native society is starting to lose its characteristics. Should we set loss of identity traits of the state as a referent object aside, societal threat lies in the presumptions and

concern of native people regarding the immigrants, which could lead to radicalization and disintegration of social cohesion which is vital for the functioning of the state. Furthermore, as data shows, persons with immigrant background tend to constantly achieve worse results on the labour market and in school, which is yet another ground for disruption of relations between societies expected to merge and in the end, affects even the states performance. More than anything, it is a catalyst for various challenges the state will eventually face, society-wise.

A need for a rational perspective has led leaders as well as several researchers to look for an alternative in the form of the so-called sustainable migration, which is a concept counting the costs and benefits of immigration. Every migratory flow has a different cost-benefit ratio and what these researchers propose, essentially, is that states decide whether to support or rather limit such migration for their own wellbeing. This could be from the position of the receiving state as well as the state of origin.

Immigration from developing countries to developed countries is increasing and heading towards unsustainability, what many European leaders realized and started acting accordingly by tightening their asylum and immigration policies. We are aware that in certain cases there is no choice, specifically when it comes to human rights and people seeking refuge, but states should not be oblivious toward their own sustainability and their own interests. Every state's primary goal is to secure its own and their citizens' welfare, therefore it is essential to take into account the fact, that should immigration be left unsustained, the opportunities for a better life sought by immigrants may be still more difficult to find.

References:

- Adams, Jr. R.H. (2003). *International Migration, Remittances and Poverty in Developing Countries*. Retrieved July 21, 2021 from URL https://documents1.worldbank.org/curated/en/991781468779406427/104504322_20041117173008/additional/wps3179.pdf
- Alexe, D. (2018). *Davos 2018: Merkel offers veiled mea culpa over immigration, regrets Brexit*. Retrieved July 21, 2021 from URL <https://www.neweurope.eu/article/migration-merkel-makes-veiled-mea-culpa-davos-regrets-brexit/>
- Alkopher, T.D., Blanc, E. (2017). Schengen area shaken: the impact of immigration-related threat perceptions on the European security community. *Journal of International Relations and Development*, 20(3), 511-542. <http://doi.org/10.1057/s41268-016-0005-9>
- Alkopher, T.D. (2018). Socio-psychological reactions in the EU to immigration: from regaining ontological security to desecuritisation. *European Security*, 27(3), 314-335. <http://doi.org/10.1080/09662839.2018.1497981>
- Betts, A., Collier, P. (2018). Sustainable Migration Framework. *EMN Norway Occasional Papers*. Oxford: University of Oxford. Retrieved July 21, 2021 from URL <https://www.regjeringen.no/contentassets/59c035d6145c48a59d834ce1969f33cb/emn-norway-occasional-papers-sustainable-migration-framework-oxford-uni.pdf>
- Boreham, G. (2016). *Merkel appeals to German voters with burqa ban promise*. Retrieved July 21, 2021 from URL <https://www.sbs.com.au/news/merkel-appeals-to-german-voters-with-burqa-ban-promise>
- Boussemart, J.M., Godet, M. (2018). *Europe 2050: Demographic Suicide*. Retrieved July 21, 2021 from URL <https://www.robert-schuman.eu/en/european-issues/0462-europe-2050-demographic-suicide>
- Buzan, B., Wæver, O., De Wilde, J. (1998). *Bezpečnost (Security)*. Brno: Centrum strategických studií.

- Carling, J., Erdal, M.B. (2018). *Is “Sustainable Migration“ a Valuable Concept?* Retrieved July 21, 2021 from URL <https://blogs.prio.org/2018/08/is-sustainable-migration-a-valuable-concept/>
- Chlebny, J. (2018). Public order, national security and the rights of third-country nationals in immigration cases. *European Journal of Migration and Law*, 20(2), 115-134. <http://doi.org/10.1163/15718166-12340023>
- Conway-Smith, E. (2015). *Africa has been “exporting brains“. Now it’s trying to lure them back.* Retrieved July 21, 2021 from URL <https://www.pri.org/stories/2015-08-19/africa-has-been-exporting-brains-now-its-trying-lure-them-back>
- Eichler, J. (2020). Immigration in France and its security consequences. *Vojenske Rozhledy-Czech Military Review*, 29(4), 3-22 <http://doi.org/10.3849/2336-2995.29.2020.04.003-022>
- Erdal, M.B., Carling, J., Horst, C., Taleraas, C. (2018). Defining Sustainable Migration. *PRIO Paper*. Oslo: PRIO. Retrieved July 21, 2021 from URL https://www.udi.no/globalassets/global/european-migration-network_i/emn-norway-papers/emn-norway-occasional-papers-defining-sustainable-migration-prio2018.pdf
- Globalization 101. (2019). *Economic Effects of Migration*. Retrieved July 21, 2021 from URL <https://www.globalization101.org/economic-effects-of-migration/>
- Ivančík, R. (2019). Quo Vadis Európska obrana a bezpečnosť (Quo Vadis European defense and security). *Politické vedy*, 22(3), 47-67. <http://doi.org/10.24040/politickevedy.2019.22.3.47-67>
- Kholodkovskii, K.G. (2019). Freedom vs security? Europe and mass immigration. *Polis-Politicheskiye Issledovaniya*, 2, 79-91. <http://doi.org/10.17976/jpps/2019.02.06>
- Lemon, E. (2019). *Dependent on Remittances, Tajikistan’s Long-Term Prospects for Economic Growth and Poverty Reduction Remain Dim.* Retrieved July 21, 2021 from URL <https://www.migrationpolicy.org/article/dependent-remittances-tajikistan-prospects-dim-economic-growth>
- Marini, M., Chokani, N., Abhari, R.S. (2019). Agent-Based Model Analysis of Impact of Immigration on Switzerland's Social Security. *Journal of International Migration and Integration*, 20(3), 787-808. <http://doi.org/10.1007/s12134-018-0631-8>
- Mastilovic, J., Zoppi, M. 2021. (In)security and Immigration to Depopulating Rural Areas in Southern and Southeastern Europe, *Southeastern Europe*, 45(2), 229-253. <http://doi.org/10.30965/18763332-45020003>
- Mohdin, A. (2018). *The EU countries that desperately need migrants to avoid shrinkage – and those that don’t.* Retrieved July 21, 2021 from <https://qz.com/1325640/the-european-countries-that-desperately-need-migrants-to-avoid-demographic-decline-and-those-that-dont/>
- Murray, A. (2021). *Denmark asylum: The Syrian refugees no longer welcome to stay.* Retrieved July 21, 2021 from URL <https://www.bbc.com/news/world-europe-57156835>
- Nedergaard, P. (2017). *The Immigration Policy Turn: The Danish Social Democratic Case.* Retrieved July 21, 2021 from URL <https://samf.ku.dk/presse/kronikker-og-debat/the-danish-social-democratic-case/>
- OECD. (2017). How does immigrant parents affect the outcomes of children in Europe? *Migration policy debates*. No. 11. Retrieved from URL <http://www.oecd.org/els/mig/How-does-having-immigrant-parents-affect-the-outcomes-of-children-in-Europe.pdf>
- Oxford Learner’s Dictionaries, (2021). *Sustainability*. Retrieved July 21, 2021 from URL <https://www.oxfordlearnersdictionaries.com/definition/english/sustainability>
- Reuters Graphics, (2019). *Europe’s demographic crisis.* Retrieved July 21, 2021 from URL <http://graphics.thomsonreuters.com/14/europedemographics/index.htm>
- Rigouste, M. (2018). Purify the territory: the struggle against immigration as a security laboratory (1968-1974). *Direito E Praxis*, 9(2), 952-968. <http://doi.org/10.1590/2179-8966/2018/34241>
- Rodriguez, I.R.R. (2017). Immigration, security and criminal policies in Europe and Latin America. *Revista General De Derecho Penal* Issue 27, Article Number 418560

Roy, N. (2018). Immigration and Security-Post 9/11 United States. *Perspectives on Global Development and Technology*, 17(4), 451-472. <http://doi.org/10.1163/15691497-12341488>

Stephen, L. (2018). Creating Preemptive Suspects: National Security, Border Defense, and Immigration Policy, 1980-Present. *Latin American Perspectives*, 45(6), 7-25. <http://doi.org/10.1177/0094582X17699907>

The Economist. (2015). *Merkel at her limit*. Retrieved July 21, 2021 from URL <https://www.economist.com/europe/2015/10/10/merkel-at-her-limit>

The Global Economy. (2021). *Remittances, percent of GDP – Country rankings*. Retrieved July 21, 2021 from URL https://www.theglobaleconomy.com/rankings/remittances_percent_gdp/

The World Bank. (2018). *Record high remittances to low- and middle-income countries in 2017*. Retrieved July 21, 2021 from URL <https://www.worldbank.org/en/news/press-release/2018/04/23/record-high-remittances-to-low-and-middle-income-countries-in-2017>

The World Bank. (2020). *World Bank Predicts Sharpest Decline of Remittances in Recent History*. Retrieved July 21, 2021 from URL <https://www.worldbank.org/en/news/press-release/2020/04/22/world-bank-predicts-sharpest-decline-of-remittances-in-recent-history>

The World Bank. (2021). *Defying Predictions, Remittance Flows Remain Strong During COVID-19 Crisis*. Retrieved July 21, 2021 from URL <https://www.worldbank.org/en/news/press-release/2021/05/12/defying-predictions-remittance-flows-remain-strong-during-covid-19-crisis>

Threat Analysis Group. (2021). *Threat, vulnerability, risk – commonly mixed up terms*. Retrieved July 21, 2021 from URL <https://www.threatanalysis.com/2010/05/03/threat-vulnerability-risk-commonly-mixed-up-terms/>

Trines, S. (2017). *Lessons from Germany's Refugee Crisis: Integration, Costs, and Benefits*. Retrieved July 21, 2021 from URL <https://wenr.wes.org/2017/05/lessons-germanys-refugee-crisis-integration-costs-benefits>

Van Munster, R. (2012). *Securitization*. Retrieved July 21, 2021 from URL <http://www.oxfordbibliographies.com/view/document/obo-9780199743292/obo-9780199743292-0091.xml>

Young, Y., Loebach, P., Korinek, K. (2018). Building walls or opening borders? Global immigration policy attitudes across economic, cultural and human security contexts. *Social Science Research*, 75, 83-95. <http://doi.org/10.1016/j.ssresearch.2018.06.006>

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THE ROLE OF TALENT IN THE ECONOMIC DEVELOPMENT OF COUNTRIES IN THE MODERN WORLD

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Abstract. The purpose of this article is to empirically test the role of talent in the economic development of countries in the modern world. As the main research method, the authors use regression analysis, which involved variables characterizing the talent competitiveness of countries, as well as indicators of countries' economic development. The authors use two indicators to empirically measure the economic development of countries in the modern world. The first is a static indicator, GDP per capita, which measures the economic performance of the world's countries. Second, the dynamic indicator of the average change in GDP per capita over the previous 10 years measures the economic growth of the world's countries. Correlation analysis is used as an additional research method. The results showed that talent is a stable and practically the main determinant of such an important element of the economic development of countries as their achieved state of economic development. At the same time, the talent competitiveness of countries is not the engine of their short-term economic growth. For economic growth, it is enough to attract talent from outside, but for the economic development of the modern world's countries to be sustainable, it is also necessary to be able to grow talents and create conditions for their efficient work within the country. All of these elements are included in the Global Talent Competitiveness Index. Based on empirical results, the authors propose to replace the Global Competitiveness Index (GCI) with the Global Talent Competitiveness Index (GTICI) in research practice. Then the talent will also be included in the conceptual understanding of countries' competitiveness in the modern world.

Keywords: talent; economic development; economic performance; economic growth; talent competitiveness

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JEL Classifications: F63, F66, J24

Additional disciplines: sociology

1. Introduction

At the end of the 20th century, a human-centered approach to assessing the economic development of countries was formed in the world economy (Cubas et al., 2016; Zhang & Zhao, 2018; Ding et al., 2020; Yang & Pan, 2020; Tsvyk & Tsvyk, 2020; Raudeliuniene et al., 2020; Shevyakova et al., 2021). This approach was based on the importance of people as the main driving force behind the country's economic development. Many researchers believe that one of the main reasons for the economic differentiation of the world's countries today is the unequal distribution of people in geographic space (Gibbons et al., 2010; Gibbons & Vignoles, 2011; Kline & Moretti 2014). In terms of creative class theory, this is an unequal distribution of talents (Florida, 2002a, 2002b, 2003; Cowling, 2009; Gu et al., 2020).

“Sustainable Development Strategy of Latvia until 2030” emphasized: “The concept of capital is used here in a broad sense and includes elements that are difficult to express directly in money. Our main capital is people, their abilities, knowledge and talent” (MEPRD, 2020). Furthermore, the Latvian “Human Development Report 2006/2007. Human Capital” noted that in industrial societies competitiveness and prosperity are determined by means of production and other material values. In turn, in a knowledge society, the main source of well-being and development is a set of human abilities and skills (Zobena, 2007).

The aim of this article is to test empirically the above statements in order to prove the role of talent in the economic development of countries in the modern world. For the theoretical substantiation of the study, the authors rely on the creative class theory of R. Florida (Florida, 2002a, 2002b, 2003). According to this theory, the human talent now increasingly determines the economic development of a territory. The role of talent trumps the importance of natural resources and physical capital. The source of empirical information for this study is data for 2016-2018 of the Global Competitiveness Report (GCR) of the World Economic Forum (World Economic Forum 2016, 2017, 2018, 2019), as well as data for 2016-2019 of the report on the Global Talent Competitiveness Index's (GTCI) (INSEAD, 2017, 2018, 2019, 2020).

The authors use the Global Talent Competitiveness Index as a tool for the empirical measurement of a country's talent competitiveness in terms of its ability to enable, attract, grow and retain talented people on a country's territory. The authors use two indicators to empirically measure the economic development of countries in the modern world. The first is a static indicator, GDP per capita, which measures the economic performance of the world's countries (Porter, 2003; Stankevics et al., 2014; NZIER, 2014; Boronenko et al., 2014; Kondratiuk-Nierodzinska, 2016). Second, the dynamic indicator of the average change in GDP per capita over the previous 10 years measures the economic growth of the world's countries (Krysovaty et al., 2020; Cizo et al., 2020). The authors used linear regression analysis as the main method of the empirical study of the influence (Cizo et al., 2020) of the countries' talent competitiveness on their economic development in the modern world.

The main limitation of this study is that the time period for empirical investigation is only a few recent years (not including the years of the Covid-19 pandemic). This allows the authors to assess the role of talent in the economic development of countries in the modern world in the pre-pandemic period. Although, the authors believe that the pandemic did not weaken, but, on the contrary, strengthened the role of talent in the economic development of countries.

2. Theoretical background

There are many works in the scientific literature devoted to the so-called “geography of talent” (Andersson, 1985; Florida, 2002a; Kerimoglu & Karahasan, 2012; Burzynski et al., 2018; Jiang et al., 2020; Gu et al., 2021). J. Rauch defined talent as a local public good (Rauch, 1993; Tian & Liu, 2018). He believes that workers with equal productivity will earn more in countries and regions with a higher talent competitiveness score (INSEAD, 2017, 2018, 2019, 2020) than in countries and regions with a lower one. This is due to the external effects of the talent competitiveness of countries (Rauch, 1993).

Talented people concentrated in a specific geographic area create the basis for the formation of so-called creative industries or creative clusters. The role of creative industries and creative clusters for territorial development has been analyzed by many scholars within the research of cities and regions (for example, Bagwell, 2008; Seidel 2009; Comunian et al., 2011; Lazzeretti, 2013; Yu et al., 2014; De Beukelaer, 2014; Correa-Quezada et al., 2018).

The term “creative industries” first mentioned in the “Creative Industries Mapping Document” (DCMS/CITF, 1998) by the Creative Industries Task Force (CITF) commissioned by the Department for Culture, Media and Sport (DCMS) of the United Kingdom. According to the aforementioned study, creative industries are “based on individual creativity, ability, and talent” and have “the potential for wealth and job creation based on intellectual property” (DCMS/CITF, 1998). Initially, the list of creative industries included 13 types of economic activities:

- advertising;
- architecture;
- arts and antiques;
- crafts;
- design;
- clothes modeling;
- cinematography;
- interactive entertainment software, including videogames;
- music;
- performing arts;
- press;
- software and information systems;
- television and radio.

This list of creative industries covered a large and varied area of economic activity. Nevertheless, it did not consider, for example, activities related to the preservation of cultural heritage. Between 1998 and 2006, CITF and DCMS of the United Kingdom examined a wide range of creative industries and changed their original list by shortening and regrouping it.

The term “creative economy” first mentioned in 2001 by media consultant J. Howkins in his book “The Creative Economy: How People Make Money from Ideas”. J. Howkins defined the creative economy as follows: “... it is based on the transformation of the results of creativity into economically valuable goods and services” (Howkins, 2001). He proposed to subdivide creative industries into four groups depending on the subject of intellectual property: patent, trademark, industrial design, and copyright. This approach generally does not contradict the definition of creative industries proposed by CITF and DCMS of the United Kingdom. But J. Howkins’ approach is considered more open, since he does not name creative industries a priori.

J. Howkins model of the creative economy contributed to the reorientation of “cultural” statistics and its indicators. In Montreal, at the International Symposium on Culture Statistics (2002) it was proposed to start using

the concept of creative economy (which has not previously been used in scientific literature) or, at least, to support the idea of the existence of creative industries (UNESCO Institute for Statistics, 2002).

More recently, the concept of “talent economy” has also appeared in the media space (less often in scientific literature) (Martin, 2014; Fulton, 2019). Since 1960 the U.S. economy has moved from largely financing the exploitation of natural resources to make the most of talent. The rewards to executives and financiers have skyrocketed as a result (Martin, 2014).

The general evolution of understanding of the creative economy is reflected in Figure 1.

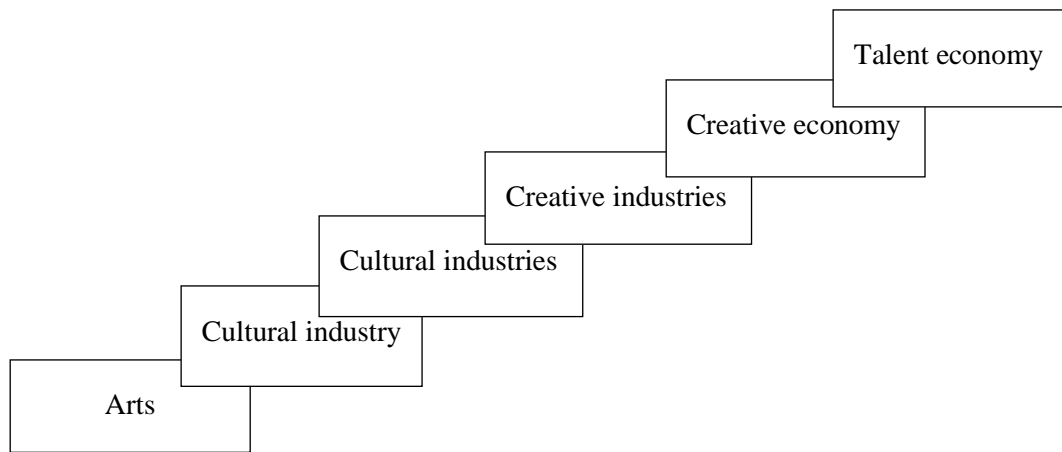


Figure 1. The general evolution of the understanding of talent economy

Source: combined by the authors based on Policy Research Group, 2013; Martin, 2014

Political and scientific interest in creativity, talent, and their impact on economic and territory development increased following the 2002 publication of R. Florida book “The Rise of the Creative Class, and How It’s Transforming Work, Leisure, Community, and Everyday Life” (Florida, 2002b). R. Florida’s creative class theory emerged in economic science as a part of a people-centered approach. According to this theory, the creativity, capabilities, and skills of people, together with technology and a tolerant cultural environment, are 3T: talent, technology, tolerance. Nowadays, all these elements increasingly determine the economic performance and growth of a territory (Florida & Gates, 2001; Florida, 2002a, 2002b, 2003, 2005, 2006; Parilla, 2019).

If the territory has all these 3Ts, it is able to attract talents with the capacity to innovate and boost economic growth. Attracting talents is followed by capital and the creation of innovative companies. In turn, attracting a talented workforce requires a diverse and tolerant society, leisure opportunities in both sport and culture, high-level schools and higher education institutions, and a governance system that promotes and supports an attractive infrastructure for talented people. According to the creative class theory developed by R. Florida, those areas that are able to grow, retain, and attract talents have a competitive advantage (Florida, 2002a, 2003).

The International Labor Organization has announced that the combination of technological innovation, automation, and the creative industries is leading to exponential changes, mainly related to ‘labor saving’ tactics to increase productivity and competitiveness (ILO, 2016). In its turn, the UN publication “Creative Economy Outlook” notes that the digital transformation will continue to change working conditions in the coming years, but it will take place unevenly in different territories (United Nations, 2018). For instance, the Oxford Economics report “Global Talent 2021: How the New Geography of Talent Will Transform Human Resource Strategies” states that “in developing countries, talent is predominantly “home grown”, and in the next decade, those regions

of the world from which we do not expect it at all will create an oversupply of talent. In other regions, such as the United States and most European countries, there will be massive retraining of the workforce to meet the demand for higher-level skills in an increasingly digitalized and globalized world” (Oxford Economics, 2021).

The economic differentiation of countries around the world stems not only from differences between territories but also from differences between people. Thus, the economic differentiation of countries is actually the result of the distribution of human talent across territories (Gibbons et al., 2010). The two main components of geographical inequality have a spatial effect, i.e. the impact of an agglomeration on firms' efficiency, and the human effect, i.e. the impact of individuals on territorial development. Many studies have shown that the human effect dominates (Gibbons et al., 2010; Gibbons & Vignoles, 2011; Kline & Moretti, 2014; Carvalho et al., 2018; Akar et al., 2021). The biggest problem facing Europe's lagging territories is the lack of a skilled and competent workforce needed to attract investment and create a favorable environment for business development in the regions. For this reason, policies to tackle territorial inequalities in the 21st century must be people-centered and not place-specific (European Trade Union Institute, 2011). Thus, the authors believe that the human-centered approach in Development Economics, as well as the creative class theory of R. Florida, offer a theoretical basis for proving the role of talent in the economic development of countries in the modern world.

3. Research objective and methodology

In world research practice, talent in relation to a territory is usually measured by perceiving the competitiveness of territory in terms of talent, rather than by applying it to individual sectors of the economy. The Global Talent Competitiveness Index (GTCI) is based on the provision that countries compete with each other in the global space by growing, attracting, and retaining talent that contributes to the country's competitiveness, innovation, and growth (INSEAD, 2018).

Table 1. Structure of the Global Talent Competitiveness Index (GTCI)

Global Talent Competitiveness Index (GTCI)					
Input				Output	
Enable	Attract	Grow	Retain	VT skills	GK skills
Regulatory Landscape	External Openness	Formal Education	Sustainability	Mid-Level Skills	High-Level Skills
Market Landscape	Internal Openness	Lifelong Learning	Lifestyle	Employability	Talent Impact
Business and Labour Landscape	-	Access to Growth Opportunities	-	-	-

Note: VT skills – Vocational and technical skills; GK skills – Global knowledge skills

Source: INSEAD, 2017

In the Global Competitiveness Report (GCR) of the World Economic Forum, there are also indicators measuring, on a scale of 1 to 7, talent competitiveness of countries with two separate components (World Economic Forum, 2016, 2017):

- country capacity to attract talent;
- country capacity to retain talent.

In turn, the “Creative Economy Outlook” measures the competitiveness of territories in terms of talent, based on the volume of export of creative goods and services produced in the territory in millions of USD (United Nations, 2018):

- creative goods – art crafts, audiovisual products, design, digital products, new media, performing arts, publishing, visual arts;

- creative services – advertising, marketing research, and public opinion surveys; architectural, engineering services, research and development services, individual, cultural, and recreational services, audiovisual and related services.

R. Florida's creative class, J. Howkins's creative economy, and the UK government's creative industries emerged as a result of a number of topical discourses important to the modern economy. At the end of the 20th century, the ideas of the knowledge economy came to the fore, so R. Florida and J. Howkins merged creative workers under the names 'creative class' and 'creative economy' linking them to the concepts of talent, creativity and innovation (Oakley, 2009).

Eurostat also points out that, in recent years, the term "creative economy" has become increasingly associated with all types of economic activity that are based on human creativity and talent, regardless of the economic sector in which it occurs. In this case, the creative economy emerges wherever human creativity, talent, non-standard thinking is the main factor of production and profit-making (Eurostat, 2018a).

The authors consider this approach to be the most appropriate for the empirical measurement of the talent competitiveness of countries. The Latvian economist V. Nespor also believes that "in any profession, you can work creatively. Just as in any of the so-called creative professions, the proportion of workers with a completely uncreative approach to their professional activities is quite large. The same applies to industries and businesses. Being in the creative industry does not mean belonging to the creative economy" (Nespor, 2010: 90). The author's conceptual approach to understanding the creative economy, based on the analysis of scientific literature and analytic reports, is shown in Figure 2.

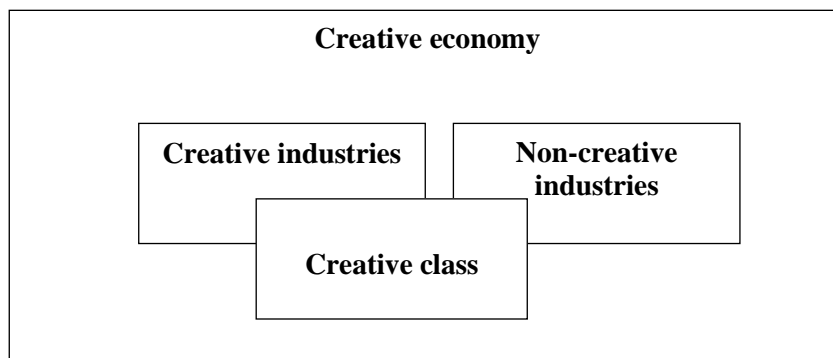


Figure 2. Mapping the creative class, the creative industries, and the creative economy

Note: it is no coincidence that in the figure a largest part of the creative class belongs to the creative industries – here the authors agree with the empirical interpretation of the creative class presented by R. Florida (Florida, 2002a: 87):

"A distinctive feature of the creative class is that its representatives are doing the work, the main function of which is creating meaningful new forms. In my view, the creative class splits into two components.

The super-creative core of the new class includes scientists and engineers, university professors, poets and writers, artists and actors, designers and architects, as well as the intellectual elite of modern society: publicists, editors, prominent cultural figures, experts from analytical centers, observers and other people whose views shape public opinion. In addition to this central group, the creative class includes "creative specialists" across a range of knowledge-based industries such as the high-tech sector, finance, law and healthcare, and business administration".

Source: elaborated by the authors, based on DCMS/CITF, 1998; Eurostat, 2018a; Howkins, 2001; Florida, 2002b, 2005, 2006; Policy Research Group, 2013; INSEAD, 2017

In turn, Eurostat methodology for the creative economy (according to Eurostat terminology – cultural economy) covers ten key economic sectors (Eurostat, 2018a): museums, archives, libraries, books and press, fine arts,

theatres, audio- and video multimedia, architecture, advertising, arts crafts. First of all, indicators such as the number of active enterprises, the size of enterprises, sales volume, employment in creative industries, and the share of these sectors in GDP are analyzed.

Table 2. Employment in creative industries,* GTCI, indicators of economic performance and growth of the EU countries, n = 28 countries, 2017

EU countries	Employment in creative industries		Export rate in creative industries		GDP per capita, thousands of USD	Average annual GDP growth during 2007-2017, %	GTCI, score from 1 to 100
	% from total employment	thousands of people	millions of USD	per one employee, USD			
Austria	4.2	180	534.7	2971	47.3	+0.9	68.63
Belgium	4.3	205	7952.2	38791	43.6	+0.9	69.56
Bulgaria	2.7	84	448.4	5338	8.1	+1.9	45.72
Croatia	3.3	54	284.4	5267	13.1	-0.2	45.42
Cyprus	3.5	14	39.1	2793	25.0	+0.2	50.29
Czechia	3.7	198	6647.9	33575	20.2	+1.5	60.02
Denmark	4.2	119	3712.7	31199	56.4	+0.6	73.79
Estonia	5.6	37	528.7	14289	19.8	+0.5	61.93
France	3.6	966	21439.3	22194	39.9	+0.7	62.61
Finland	4.9	126	747.1	5929	46.0	0.0	73.95
Germany	4.0	1661	29158.2	17555	44.5	+1.2	67.77
Greece	3.3	125	808.7	6470	18.6	-2.9	48.21
Hungary	3.4	150	1380.9	9206	15.5	+1.0	44.25
Ireland	3.4	77	1329.7	17269	70.6	+4.1	71.38
Italy	3.6	831	30512.1	36717	32.0	-0.6	50.55
Latvia	3.5	32	407.7	12741	15.5	+0.1	52.27
Lithuania	4.0	56	1329.1	23734	16.7	+1.3	53.31
Luxembourg	5.3	15	174.3	11620	105.8	+2.0	71.64
Malta	5.2	12	185.4	15450	27.3	+4.2	58.77
Netherlands	4.6	408	10055.4	24646	48.3	+0.9	72.56
Poland	3.6	586	6477.4	11054	13.8	+3.3	50.06
Portugal	3.2	158	1673.5	10592	21.2	-0.1	55.75
Romania	1.6	141	1367.4	9698	10.8	+2.4	41.13
Slovakia	2.8	72	1728.4	24006	17.7	+2.4	50.02
Slovenia	4.7	47	772.3	16432	23.7	+0.6	55.77
Spain	3.5	678	6505.2	9595	28.4	+0.3	54.91
Sweden	4.6	235	3508.5	14930	53.2	+1.6	74.32
United Kingdom	4.5	1471	24187.3	16443	39.7	+1.1	73.11

* According to Eurostat: cultural employment

Source: Eurostat, 2018b; United Nations, 2018; INSEAD, 2018; World Economic Forum, 2018; calculations of the authors

The authors believe that when analyzing the talent competitiveness of a territory, a creative people-oriented approach is more efficient than a creative industries-oriented approach, even though it is less economic. The reasoning for this position seems to be simple enough for the authors, since in the creative industries not all employees perform creative activities. For instance, in museums, archives, libraries, and theaters people also work in “non-creative” positions such as accountants, cashiers, cleaners, security guards, etc. Probably because some EU countries have a relatively high share of “non-creative” workers in the creative industries, these countries have a low export rate per employee in the creative industries (Table 2). On the other hand, such industries as science, education, medicine, catering are not on the list of creative industries, although many talented scientists, teachers, doctors, culinary and confectioners work in them, which increase not only the competitiveness of their

industries but also the competitiveness of territories where they live. The authors argue that talented people are necessary and employable in any sector of the economy, not just in the limited list of creative industries. Thus, it is significant that the main topic of the report “The Global Talent Competitiveness Index 2019: Entrepreneurial Talent and Global Competitiveness” became entrepreneurial talent that can be used in any economic sector (INSEAD, 2019).

In order to empirically prove that a creative people-oriented approach to exploring the talent competitiveness of a territory is more efficient than creative industries-oriented approach, the authors carried out a correlation analysis in the sample of EU countries.

Table 3. Interconnection between employment in creative industries, GTCI and some economic indicators in the EU countries, Pearson correlation coefficient, n = 28 countries, 2017

Correlated variables	Employment in creative industries, % from total employment	GTCI, score from 1 to 100
GDP per capita, thousands of USD	0.510 p = 0.003	0.795 p = 0.001
Average annual GDP growth during 2007-2017, %	0.026 p = 0.011	0.137 p = 0.010
Export rate in creative industries, per one employee, USD	0.141 p = 0.006	0.290 p = 0.000
Interconnection between employment in creative industries (% from total employment) and GTCI	0.684 p = 0.014	

Source: calculated by the authors using data of Table 2

The results of the correlation analysis in the sample of EU countries presented in Table 3 show that the GTCI is closer than the relative employment in creative industries, correlates with both GDP per capita and GDP growth rate, as well as with exports of creative industries per employee. With all three indicators selected for the correlation analysis, the Pearson correlation coefficient for GTCI is significantly higher than for the relative employment in creative industries (Table 3). It should be emphasized that these “indicators-competitors” – the relative employment in creative industries and GTCI – are moderately and statistically significantly proportionally correlate between themselves (Table 3). Therefore, based on the results of correlation analysis and following the previous logical analysis the authors will use GTCI for further empirical research as an indicator more closely linked to the economic performance and growth of territory than relative employment in creative industries. The additional argument for this choice is the fact that the export rate in creative industries per employee, for instance, in Belgium is 7.4 times higher than in Croatia (Table 2). This means that the indicator of relative employment in creative industries does not, in itself (without taking into consideration the above-mentioned export rate in creative industries per employee) indicate the efficiency of creative industries in a particular country.

As for measuring the economic development of countries, as already indicated in the Introduction to this article, the authors use for this purpose one static indicator – GDP per capita for the current year (an indicator of economic performance), as well as a dynamic indicator – the average annual GDP growth during the previous 10 years (an indicator of economic growth) (World Economic Forum, 2017, 2018, 2019).

For an empirical study of the role of talent in the countries’ economic development in the modern world, the authors used the method of linear regression analysis with stepwise inclusion of factor variables. Regression analysis was carried out on three samples of countries of the world – for 2016 (INSEAD, 2017; World Economic Forum, 2016, 2017), for 2017 (INSEAD, 2018; World Economic Forum, 2017, 2018) and for 2018 (INSEAD, 2019; World Economic Forum, 2018, 2019) separately for the indicator “GDP per capita (by the purchasing

power parity, PPP)” and the indicator “average annual GDP growth during the previous 10 years”. As factor variables, in addition to talent indicators (GTCI and two above-mentioned “talent” indicators from the Global Competitiveness Report (excluding Global Competitiveness Report 2018)), the authors also included in the analysis 12 “background” factor variables – pillars of the Global Competitiveness Index (GCI), which are rated for the world’s countries on a scale from 1 (minimum) to 7 (maximum) (World Economic Forum, 2017, 2018, 2019). These “background” factors (GCI pillars) have undergone some changes during the three years studied (Table 4).

Table 4. Changes in pillars of the Global Competitiveness Index (GCI), 2016-2018

Serial number within the GCI	Pillars of the Global Competitiveness Index (GCI)		
	2016	2017	2018
1	Institutions		
2	Infrastructure		
3	Macroeconomic environment		ICT adoption
4	Health and primary education		Macroeconomic stability
5	Higher education and training		Health
6	Goods market efficiency		Skills
7	Labor market efficiency		Product market
8	Financial market development		Labor market
9	Technological readiness		Financial system
10	Market size		
11	Business sophistication		Business dynamism
12	Innovation		Innovation capability

Source: elaborated by the authors based on World Economic Forum, 2016, 2017, 2018

In addition to the results obtained over three years, the authors also analyzed the available data for 2019. Although, of all the data available for the period 2016-2018, in 2019 only data on GDP per capita (by the purchasing power parity) and GTCI were published for 132 countries (INSEAD, 2020).

4. Results and discussion

As a result of the regression analysis, the following regression equations were obtained for the period 2016-2018:

$$y = -46.763 + 3.976x_{14} + 1.208x_{13}, \quad (1)$$

where:

y – GDP per capita (PPP), thousands of USD, 2016

x₁₄ – country capacity to attract talent, score from 1 to 7, 2016

x₁₃ – GTCI, score from 1 to 100, 2016

Excluded variables:

x₁ – institutions, score from 1 to 7, 2016

x₂ – infrastructure, score from 1 to 7, 2016

x₃ – macroeconomic environment, score from 1 to 7, 2016

x₄ – health and primary education, score from 1 to 7, 2016

x₅ – higher education and training, score from 1 to 7, 2016

x₆ – goods market efficiency, score from 1 to 7, 2016

x₇ – labour market efficiency, score from 1 to 7, 2016

x₈ – financial market development, score from 1 to 7, 2016

x₉ – technological readiness, score from 1 to 7, 2016

x₁₀ – market size, score from 1 to 7, 2016

x₁₁ – business sophistication, score from 1 to 7, 2016

x₁₂ – innovation, score from 1 to 7, 2016

x₁₅ – country capacity to retain talent, score from 1 to 7, 2016

Source: calculated by the authors using the SPSS software based on the data of INSEAD, 2017; World Economic Forum, 2016, 2017

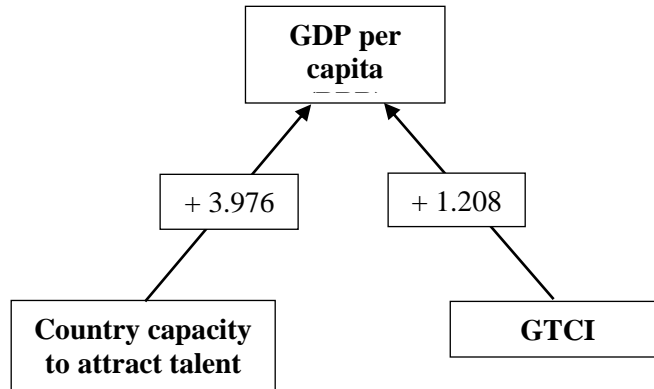


Figure 3. The role of talent in economic performance of the world's countries, statistically significant factor variables and the β coefficients of the regression equation, $n = 114$ countries, 2016

Source: elaborated by the authors based on regression Equation 1

Since the Global Competitiveness Reports, which contain empirical data for 2016 (World Economic Forum, 2016, 2017), does not contain data on the economic growth of countries over the past 10 years, in 2016 it was possible to assess the impact of talent only on the static element of economic development of the modern world's countries – their economic performance, measured by the GDP per capita (Equation 1). Statistically significant factors stimulating the economic performance of the countries in 2016 turned out to be 2 out of 15 potentially possible: the country's capacity to attract talents and GTCI (Figure 3). Thus, in the presence of indicators related to talent in the set of potential factors of the economic performance of the countries, all other factors did not have a statistically significant effect on GDP per capita in 2016.

$$y = -13.779 - 6.969x_5 + 5.910x_{12} - 4.704x_7 + 1.289x_{13}, \quad (2)$$

where:

y – GDP per capita (PPP), thousands of USD, 2017

x_5 – higher education and training, score from 1 to 7, 2017

x_{12} – innovation, score from 1 to 7, 2017

x_7 – labor market efficiency, score from 1 to 7, 2017

x_{13} – GTCI, score from 1 to 100, 2017

Excluded variables:

x_1 – institutions, score from 1 to 7, 2017

x_2 – infrastructure, score from 1 to 7, 2017

x_3 – macroeconomic environment, score from 1 to 7, 2017

x_4 – health and primary education, score from 1 to 7, 2017

x_6 – goods market efficiency, score from 1 to 7, 2017

x_8 – financial market development, score from 1 to 7, 2017

x_9 – technological readiness, score from 1 to 7, 2017

x_{10} – market size, score from 1 to 7, 2017

x_{11} – business sophistication, score from 1 to 7, 2017

x_{14} – country capacity to attract talent, score from 1 to 7, 2017

x_{15} country capacity to retain talent, score from 1 to 7, 2017

Source: calculated by the authors using the SPSS software based on the data of INSEAD, 2018; World Economic Forum, 2017, 2018

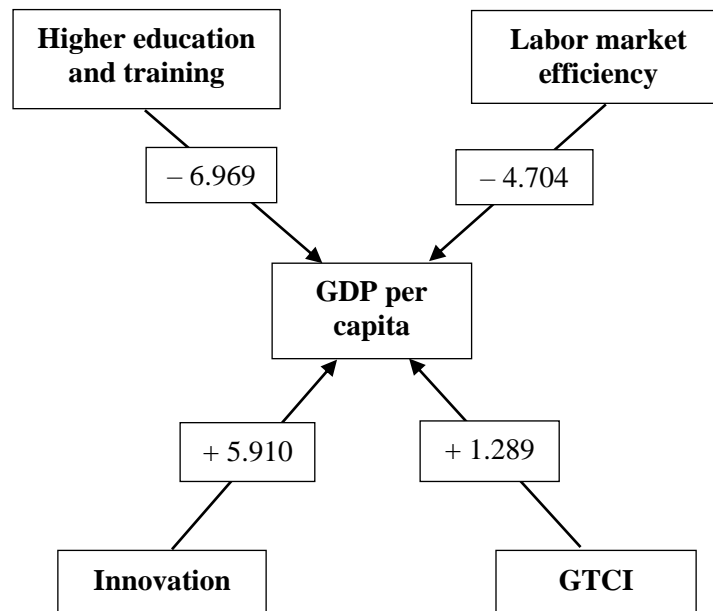


Figure 4. The role of talent in economic performance of the world's countries, statistically significant factor variables and the β -coefficients of the regression equation, n = 117 countries, 2017

Source: elaborated by the authors based on regression Equation 2

The results of the regression analysis of the role of talent in the economic performance of the world's countries in the next – 2017 – year show that there are several factors that statistically significantly affect the economic performance of countries. For example, factors such as innovation and GTCI increase the economic performance of the world's countries, while factors such as higher education and training, as well as labor market efficiency, even reduce the economic performance of countries (Equation 2 and Figure 4). Among 15 factors, 12 of which are pillars of the Global Competitiveness Index, only two factors statistically significantly increase the economic performance of the world's countries – these are innovation and, again, GTCI (which, in a sense, can be considered synonymous). It is interesting that the factor of higher education and vocational training does not contribute to an increase in the economic performance of the world's countries, but on the contrary, reduces it. The Latvian researchers A. Stankevics, S. Ignatjeva, and V. Mensikovs concluded approximately the same: the high indicators of the world's countries in higher education and vocational training contribute to an increase in GDP per capita only if these countries are highly developed in technological readiness. Otherwise, the factor of higher education and vocational training does not contribute to the economic performance of countries but rather decreases it (for example, in the form of the so-called “brain drain”) (Stankevics et al., 2014).

$$y = 0.983 + 1.508x_{14} + 0.683x_3 - 0.144x_{13}, \quad (3)$$

where:

y – average annual GDP growth during 2007-2017, %

x_{14} – country capacity to attract talent, score from 1 to 7, 2017

x_3 – macroeconomic environment, score from 1 to 7, 2017

x_{13} – GTCI, score from 1 to 100, 2017

Excluded variables:

x_1 – institutions, score from 1 to 7, 2017

x_2 – infrastructure, score from 1 to 7, 2017

- x₄ – health and primary education, score from 1 to 7, 2017
- x₅ – higher education and training, score from 1 to 7, 2017
- x₆ – goods market efficiency, score from 1 to 7, 2017
- x₇ – labor market efficiency, score from 1 to 7, 2017
- x₈ – financial market development, score from 1 to 7, 2017
- x₉ – technological readiness, score from 1 to 7, 2017
- x₁₀ – market size, score from 1 to 7, 2017
- x₁₁ – business sophistication, score from 1 to 7, 2017
- x₁₂ – innovation, score from 1 to 7, 2017
- x₁₅ – country capacity to retain talent, score from 1 to 7, 2017

Source: calculated by the authors using the SPSS software based on the data of INSEAD, 2018; World Economic Forum, 2017, 2018

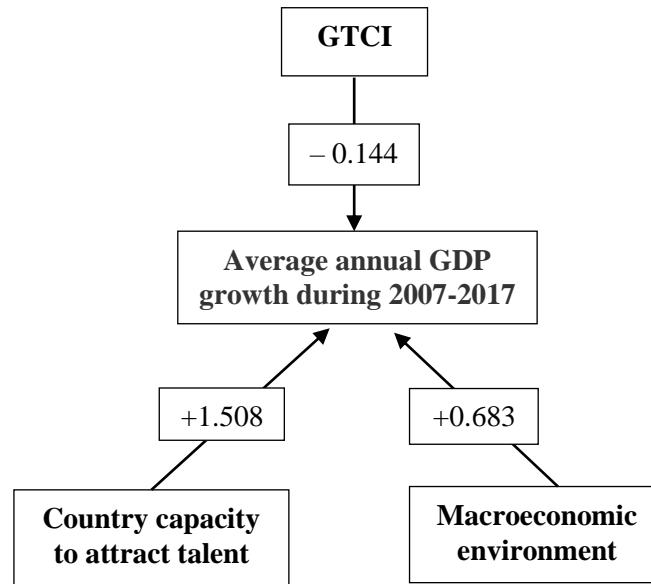


Figure 5. The role of talent in economic growth of the world's countries, statistically significant factor variables and the β -coefficients of the regression equation, n = 117 countries, 2017

Source: elaborated by the authors based on regression Equation 3

In turn, two out of 15 factors have the greatest stimulating effect on the economic growth of the world's countries in 2017: the macroeconomic environment and the country's capacity to attract talent (Equation 3 and Figure 5). Interestingly, the ability of a particular country to attract talent, in contrast to the GTCI as a whole,¹ is the most powerful of the 15 factors included in the regression analysis and becomes practically the main stimulus for the economic growth of the countries. However, the stable and sustainable economic performance of countries in the modern world requires their fuller competitiveness in talent, which includes the ability of countries to enable, attract, grow and retain talents (i.e. GTCI). It is interesting that the GTCI in 2017 negatively affects the economic growth of the world's countries – most likely because the implementation of all the above components of the GTCI requires large investments and really slows down short-term economic growth.

¹ Country's capacity to attract talent is a separate indicator in the World Economic Forum's Global Competitiveness Reports (World Economic Forum, 2017, 2018), but it is also an integral part of the GTCI (INSEAD, 2017, 2018, 2019, 2020).

$$y = 8.740 + 1.548x_{13} - 0.677x_{11} - 0.578x_6 + 0.464x_3, \quad (4)$$

where:

y – GDP per capita (PPP), thousands of USD, 2018

x_{13} – GTCI, score from 1 to 100, 2018

x_{11} – business dynamism, score from 1 to 100, 2018

x_6 – skills, score from 1 to 100, 2018

x_3 – ICT adoption, score from 1 to 100, 2018

Excluded variables:

x_1 – institutions, score from 1 to 100, 2018

x_2 – infrastructure, score from 1 to 100, 2018

x_4 – macroeconomic stability, score from 1 to 100, 2018

x_5 – health, score from 1 to 100, 2018

x_7 – product market, score from 1 to 100, 2018

x_8 – labour market, score from 1 to 100, 2018

x_9 – financial system, score from 1 to 100, 2018

x_{10} – market size, score from 1 to 100, 2018

x_{12} – innovation capability, score from 1 to 100, 2018

Source: calculated by the authors using the SPSS software based on the data of INSEAD, 2019; World Economic Forum, 2018, 2019

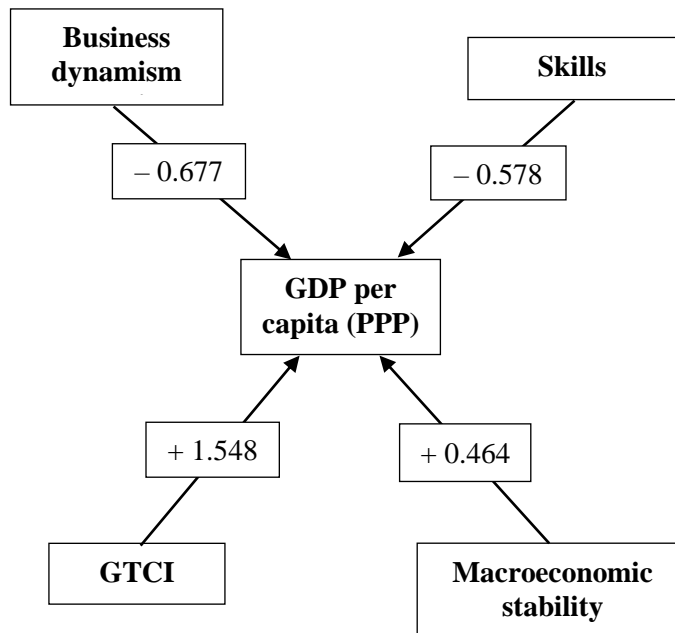


Figure 6. The role of talent in economic performance of the world's countries, statistically significant factor variables and the β -coefficients of the regression equation, n = 122 countries, 2018

Source: elaborated by the authors based on regression Equation 4

In 2018, the economic performance of the world's countries was positively and statistically significantly influenced by such factors as the GTCI (which is consistent with the results for 2016 and 2017) and macroeconomic stability (Equation 4 and Figure 6). In turn, factors such as business dynamism and skills are

factors that statistically significantly reduce the economic performance of countries in the modern world. With regard to the skills' factor,² this result practically confirms the result obtained in 2017. As for the business dynamism (in 2016 and 2017 this factor was called “business sophistication” and included more subjective estimates), the authors find it difficult to explain the negative impact of this factor on the economic performance of the world's countries – especially since this is observed only in 2018 (perhaps, this is the beginning of some new trend or pattern that requires further study).

$$y = 3.413 - 0.097x_6 + 0.095x_8, \quad (5)$$

where:

y – average annual GDP growth during 2008-2018, %

x₆ – skills, score from 1 to 100, 2018

x₈ – labour market, score from 1 to 100, 2018

Excluded variables:

x₁ – institutions, score from 1 to 100, 2018

x₂ – infrastructure, score from 1 to 100, 2018

x₃ – ICT adoption, score from 1 to 100, 2018

x₄ – macroeconomic stability, score from 1 to 100, 2018

x₅ – health, score from 1 to 100, 2018

x₇ – product market, score from 1 to 100, 2018

x₉ – financial system, score from 1 to 100, 2018

x₁₀ – market size, score from 1 to 100, 2018

x₁₁ – business dynamism, score from 1 to 100, 2018

x₁₂ – innovation capability, score from 1 to 100, 2018

x₁₃ – GTCI, score from 1 to 100, 2018

Source: calculated by the authors using the SPSS software based on the data of INSEAD, 2019; World Economic Forum, 2018, 2019

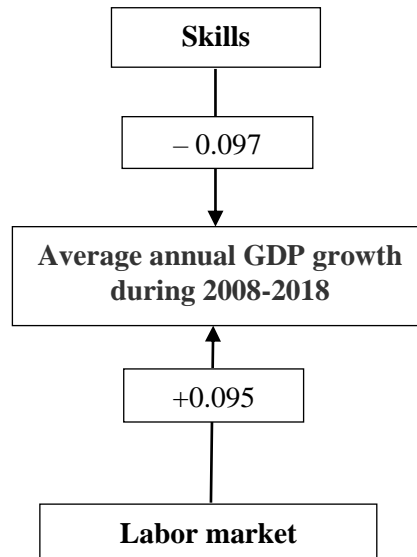


Figure 7. The role of talent in economic growth of the world's countries, statistically significant factor variables and the β -coefficients of the regression equation, n = 122 countries, 2018

Source: elaborated by the authors based on regression Equation 5

² The “skills” indicator (World Economic Forum, 2018, 2019) replaced the previous “higher education and training” indicator (World Economic Forum, 2017), stressing professional skills of the workforce (for example, critical thinking and digital skills) instead of the emphasis on the education system (for example, secondary and tertiary education enrollment rate, Internet access in schools, etc.).

The results of the regression analysis for economic growth in 2018 show that the factor of workforce skills began to negatively affect not only the static indicator of the economic development of the world's countries – economic performance of countries (Figure 6), but also the dynamic indicator – their economic growth (Figure 7). In turn, the factor that statistically significantly accelerates the economic growth of the world's countries in 2018 is only the labor market (while since 2018 such indicators as the country's capacity to attract and retain talent are no longer measured separately).

In the following Table 5, for a complex perception of the results of the regression analysis, the authors summarized statistically significant factors – both stimulating and inhibiting the economic performance and economic growth of countries in the modern world.

Table 5. Summary table of factors that statistically significantly inhibit and stimulate the economic development of countries in the modern world, 2016-2018

Components of countries' economic development	2016		2017		2018	
	n = 114 countries		n = 117 countries		n = 122 countries	
	Inhibiting factors	Stimulating factors	Inhibiting factors	Stimulating factors	Inhibiting factors	Stimulating factors
Economic performance	No such factors	Country capacity to attract talents, GTCI	Higher education and training, labor market efficiency	Innovation, GTCI	Skills, business dynamism	GTCI , macroeconomic stability
Economic growth	Economic growth was not measured		GTCI	Country capacity to attract talents, macroeconomic environment	Skills	Labor market

Source: elaborated by the authors based on regression Equations 1-5

The summarized data of the regression analysis for the period 2016-2018, shown in Table 5, allow the authors to empirically prove the significant stimulating role of talent in the economic development of countries in the modern world. It is only necessary to stress that talent, measured for the world's countries by the Global Talent Competitiveness Index, mainly stimulates the static component of the economic development of countries – their achieved economic performance, but not dynamic economic growth. But it is the achieved economic performance, according to the authors, that is the key component of the phenomenon of economic development of a territory.

For 2019, the Global Competitiveness Index (with all its pillars – factors for regression analysis in the framework of this study) was not measured (World Economic Forum, 2020). Thus, the authors used data of the report on the Global Talent Competitiveness Index, GTCI (INSEAD, 2020) in order to measure the role of talent, at least only in the economic performance of the world's countries (in 2020, the World Economic Forum did not provide data on economic growth for the previous 10 years).

$$y = -30.692 + 1.244x_1, \quad (6)$$

where:

y – GDP per capita (PPP), thousands of USD, 2019

x₁ – GTCI, score from 1 to 100, 2019

Source: calculated by the authors using the SPSS software based on the data of INSEAD, 2020

The data of the regression equation 6 for 2019 confirms the results of the author's calculations, made according to the data for 2016-2018 and indicates that talent statistically significantly contributes to the economic performance of the countries in the modern world.

Based on stable empirical results obtained by regression analysis of data for more than 100 countries of the world over four years, the authors believe that the Global Talent Competitiveness Index (GTCI) could now practically replace the Global Competitiveness Index (GCI). In order to support their proposal with empirical data, the authors calculated the correlative relationship between GTCI and GCI for the period 2016-2018.

Table 6. The correlative relationship between the Global Talent Competitiveness Index (GCI) and the Global Competitiveness Index (GCI), 2016-2018

Correlation parameters	2016	2017	2018
	n = 114 countries	n = 117 countries	n = 122 countries
Pearson correlation coefficient	0.903	0.945	0.939
Statistical significance	0.000	0.000	0.000
Probability	99%	99%	99%

Source: compiled and calculated by the authors using the SPSS program based on the data of INSEAD, 2017, 2018, 2019; World Economic Forum, 2017, 2018, 2019

The data of Table 6 empirically substantiate the authors' proposal on the feasibility of replacing the Global Competitiveness Index (GCI) with the Global Talent Competitiveness Index (GTCI), since both of these indices consistently show a very close correlation relationship. GTCI already has been successfully introduced into global research practice and has been calculated for at least 4 years (INSEAD, 2017, 2018, 2019, 2020).

Conclusions

The concept of talent has become frequently used in the scientific economic literature and global economic research as the main driving force of the talent economy. In order to empirically prove the role of talent in the economic development of countries in the modern world, the authors chose a methodological approach based on talent competitiveness. The competitiveness-based approach has been quite successfully applied in global research practice when studying and comparing countries– for example, in the framework of the annual report on the Global Talent Competitiveness Index (INSEAD, 2017, 2018, 2019, 2020).

The results of the author's empirical research have shown that competitiveness in terms of talent is indeed a stable and practically the main determinant of a key component of the economic development of the modern world's countries – their achieved economic performance. At the same time, the talent competitiveness of countries is not the engine of their short-term economic growth (another component of economic development). Research results show that it is enough to attract talent from the outside for economic growth. Thus, in order to be economically sustainable in the long-term, the modern world's countries have to be able to nurture talents and create conditions for their efficient activity within the country – all these elements are included in the Global Talent Competitiveness Index. Based on the empirical results obtained, the authors propose for the global research practice to replace the Global Competitiveness Index (GCI) with the Global Talent Competitiveness Index (GTCI), thus introducing the concept of talent also into the conceptual understanding of the competitiveness of countries in the modern world.

References

- Akar, G., Saritas, T., & Kizilkaya, O. (2021). The Impact of Human Development on Economic Growth: An Application on Transition Economies. *Business and Economics Research Journal*, 12(3), 307-318. <https://doi.org/10.20409/berj.2021.323>
- Andersson, A. (1985). Creativity and regional development. *Papers in Regional Science*, 56(1), 5-20. <https://doi.org/10.1007/BF01887900>
- Bagwell, S. (2008). Creative clusters and city growth. *Creative Industries Journal*, 1(1), 31-46. https://doi.org/10.1386/cij.1.1.31_1
- Boronenko, V., Mensikovs, V., & Lavrinenko, O. (2014). The impact of EU accession on the economic performance of the countries' internal (NUTS 3) regions. *Proceedings of Rijeka School of Economics*, 32(2), 313-341.
- Burzynski, M., Deuster, Ch., & Docquier, F. (2018). The geography of talent: development implications and long-run prospects. *Development Policies*, Working Paper No. 221. Retrieved September 10, 2021, from <https://ferdi.fr/dl/df-oC5YjcfTDFgS8ruKbaWjELSw/ferdi-p221-the-geography-of-talent-development-implications-and-long-run.pdf>
- Carvalho, L., Rego, C., Lucas, M.R., Sanchez-Hernandez, M.I., & Noronha, A. (2018). *Entrepreneurship and Structural Change in Dynamic Territories: Contributions from Developed and Developing Countries*. Springer.
- Cizo, E., Lavrinenko, O., & Ignatjeva, S. (2020). Analysis of the relationship between financial development and economic growth in the EU countries. *Insights into Regional Development*, 2(3), 645-660. [https://doi.org/10.9770/IRD.2020.2.3\(3\)](https://doi.org/10.9770/IRD.2020.2.3(3))
- Comunian, R., Faggian, A., & Jewell, S. (2011). Winning and losing in the creative industries: an analysis of creative graduates' career opportunities across creative disciplines. *Cultural Trends*, 20(3-4), 91-308. <https://doi.org/10.1080/09548963.2011.589710>
- Correa-Quezada, R., Alvarez-Garcia, J., Rio-Rama, M., & Maldonado-Erazo, C. (2018). Role of creative industries as a regional growth factor. *Sustainability*, 10(5), 1649. <https://doi.org/10.3390/su10051649>
- Cowling, M. (2009). *The Geographical Distribution of UK Talent: causes and consequences*. Working Paper WP24. Institute for Employment Studies. Retrieved September 10, 2021, from <https://www.employment-studies.co.uk/resource/geographical-distribution-uk-talent-causes-and-consequences>
- Cubas, G., Ravikumar, B., & Ventura, G. (2016). Talent, labor quality, and economic development, *Review of Economic Dynamics*, 21, 160-181. <https://doi.org/10.1016/j.red.2015.06.004>
- DCMS/CITF (1998). *Creative Industries Mapping Document*. Retrieved September 10, 2021, from <https://www.gov.uk/government/publications/creative-industries-mapping-documents-1998>
- De Beukelaer, C. (2014). Creative industries in “developing” countries: Questioning country classifications in the UNCTAD creative economy reports, *Cultural Trends*, 23, 232-251. <https://doi.org/10.1080/09548963.2014.912043>
- Ding, Y.Y., Yao, F.G., Lv, H.X., & Hu, Y. (2020). Interaction between marine economic development and talent cultivation: the result of canonical correlation analysis. *Journal of Coastal Research*, 103, 79-84. <https://doi.org/10.2112/SI103-017.1>
- European Trade Union Institute (2011). *Regional Inequalities in Europe*. Retrieved September 10, 2021, from <https://www.etui.org/content/download/5425/53612/file/Chap+7.pdf>
- Eurostat (2018a). *Guide to Eurostat Culture Statistics 2018*. Retrieved September 10, 2021, from <https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-18-011>
- Eurostat (2018b). *Culture statistics – cultural employment*. Retrieved September 10, 2021, from https://ec.europa.eu/eurostat/statistics-explained/index.php/Culture_statistics_-_cultural_employment#Cultural_employment_E2.80.94_overall_developments
- Florida, R. (2002a). The economic geography of talent. *Annals of the American Association of Geographers*, 92(4), 743-755. <https://doi.org/10.1111/1467-8306.00314>
- Florida, R. (2002b). *The Rise of the Creative Class, and How It's Transforming Work, Leisure, Community and Everyday Life*. New York: Basic Books.
- Florida, R. (2003). Cities and the Creative Class. *City & Community*, 2(1), 3-19. <https://doi.org/10.1111/1540-6040.00034>
- Florida, R. (2005). *Cities and the Creative Class*. New York: Routledge.
- Florida, R. (2006). *The Flight of the Creative Class: The New Global Competition for Talent*. New York: Harper Business.
- Florida, R., & Gates, G. (2001). *Technology and Tolerance: The Importance of Diversity to High-Tech Growth*. Washington: DC Brookings Institution, Center for Urban and Metropolitan Policy.

- Gibbons, S., & Vignoles, A. (2011). Geography, choice and participation in higher education in England. *Regional Science and Urban Economics*, 42(1-2), 98-113. <https://doi.org/10.1016/j.regsciurbeco.2011.07.004>
- Gibbons, S., Overman, H., & Pelkonen, P. (2010). Wage disparities in Britain: people or place? Retrieved September 10, 2021, from: <http://eprints.lse.ac.uk/30845/1/sercdp0060.pdf> (accessed 10 September 2021)
- Gu, H., Meng, X., Shen, T., & Wen, L. (2020). China's Highly Educated Talents in 2015: Patterns, Determinants and Spatial Spillover Effects. *Applied Spatial Analysis and Policy*, 13(2), 631–648. <https://doi.org/10.1007/s12061-019-09322-6>
- Gu, H.Y., Rowe, F., Liu, Y., & Shen, T.Y. (2021). Geography of talent in China during 2000-2015: an Eigenvector Spatial Filtering Negative Binomial approach. *Chinese Geographical Science*, 31(2), 297-312. <https://doi.org/10.1007/s11769-021-1191-y>
- Howkins, J. (2001). *The Creative Economy: How People Make Money from Ideas*. London: Penguin.
- ILO (International Labour Office) (2016). *Technological changes and work in the future: making technology work for all*. Retrieved September 10, 2021, from https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_534201.pdf
- INSEAD (The Business School for the World) (2017). *The Global Talent Competitiveness Index 2017: Talent and Technology*. Retrieved September 10, 2021, from <https://www.insead.edu/sites/default/files/assets/dept/globalindices/docs/GTCI-2017-report.pdf>
- INSEAD (The Business School for the World) (2018). *The Global Talent Competitiveness Index 2018: Diversity for Competitiveness*. Retrieved September 10, 2021, from <https://www.insead.edu/sites/default/files/assets/dept/globalindices/docs/GTCI-2018-report.pdf>
- INSEAD (The Business School for the World) (2019). *The Global Talent Competitiveness Index 2019: Entrepreneurial Talent and Global Competitiveness*. Retrieved September 10, 2021, from <https://www.insead.edu/sites/default/files/assets/dept/globalindices/docs/GTCI-2019-Report.pdf>
- INSEAD (The Business School for the World) (2020). *The Global Talent Competitiveness Index 2020: Global Talent in the Age of Artificial Intelligence*. Retrieved September 10, 2021, from <https://www.insead.edu/sites/default/files/assets/dept/globalindices/docs/GTCI-2020-report.pdf>
- Jiang, H., Zhang, W., & Duan, J. (2020). Location Choice of Overseas High-Level Young Returned Talents in China. *Sustainability*, 12, 9210. <https://doi.org/10.3390/su12219210>
- Kerimoglu, E., & Karahasan, B. (2012). Geography of talent for understanding regional disparities in Spain. *Journal of Urban and Regional Analysis*, 4(2), 103-128. <https://doi.org/10.37043/JURA.2012.4.2.1>
- Kline, P., & Moretti, E. (2014). People, places, and public policy: some simple welfare economics of local economic development policies. *Annual Review of Economics*, 6, 629-662. <https://doi.org/10.1146/annurev-economics-080213-041024>
- Kondratiuk-Nierodzinska, M. (2016). New knowledge generation capabilities and economic performance of Polish regions. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 11(3), 451-471. <https://doi.org/10.12775/EQUIL.2016.021>
- Krysovaty A., Fedosov V., Tymchenko O., & Silchenko M. (2020). Taxation, economic growth and welfare in a low-income country. *Economic Annals XXI*, 181(1-2), 44-56. <https://doi.org/10.21003/ea.V181-04>
- Lazzeretti, L. (2013). *Creative Industries and Innovation in Europe: Concepts, Measures and Comparative Case Studies*. London: Routledge.
- Martin, R. (2014). *The rise (and likely fall) of the talent economy*. Retrieved September 10, 2021, from <https://hbr.org/2014/10/the-rise-and-likely-fall-of-the-talent-economy>
- MEPRD (Ministry of Environmental Protection and Regional Development of the Republic of Latvia) (2020). *Sustainable Development Strategy of Latvia until 2030*. Retrieved September 10, 2021, from <http://www.varam.gov.lv/lat/pol/ppd/?doc=13857> (in Latvian)
- Nesporis, V. (2010). Radosa ekonomika un augstakas izglitibas problemas Latvija. *Economics and Business. Economy: Theory and Practice*, 20, 90-93. (in Latvian)
- NZIER (New Zealand Institute of Economic Research) (2014). *Regional economies: shape, performance and drivers*. NZIER Public Discussion Papers, 2014/03. Retrieved September 10, 2021, from <https://nzier.org.nz/publication/regional-economies-shape-performance-and-drivers-nzier-working-paper20143>
- Oakley, K. (2009). The disappearing arts: creativity and innovation after the creative industries. *International Journal of Cultural Policy*, 15(4), 403-441. <https://doi.org/10.1080/10286630902856721>
- Oxford Economics (2021). *Global Talent 2021: How the New Geography of Talent Will Transform Human Resource Strategies*. Retrieved September 10, 2021, from <https://www.oxfordeconomics.com/Media/Default/Thought%20Leadership/global-talent-2021.pdf>

- Parilla, J. (2019). Talent is precious. That's why economic development should focus on developing it. *Economic Prosperity*, December 11. Retrieved September 10, 2021, from <https://better-cities.org/economic-prosperity/talent-is-precious-thats-why-economic-development-should-focus-on-developing-it/>
- Policy Research Group (Ed.) (2013). *The Creative Economy: Key Concepts and Literature Review Highlights*. Retrieved September 10, 2021, from https://cch.novascotia.ca/sites/default/files/inline/documents/creative-economy-synthesis_201305.pdf
- Porter, M. (2003). The economic performance of regions. *Regional Studies*, 37(6-7), 549-578. <https://doi.org/10.1080/0034340032000108688>
- Rauch, J. (1993). Productivity gains from geographic concentrations of human capital: evidence from cities. *Journal of Urban Economics*, 34(3), 380-400. <https://doi.org/10.1006/juec.1993.1042>
- Raudeliuniene, J., Tvaronaviciene, M., & Blazyte, M. (2020). Knowledge Management Practice in General Education Schools as a Tool for Sustainable Development. *Sustainability*, 12(10), 4034. <https://doi.org/10.3390/su12104034>
- Seidel, S. (2009). *Toward a Theory of Managing Creativity-Intensive Processes: A Creative Industries Study*. Liechtenstein: Springer-Verlag.
- Shevyakova, A., Munsh, E., Arystan, M., & Petrenko, Y. (2021). Competence development for Industry 4.0: Qualification requirements and solutions. *Insights into Regional Development*, 3(1), 124-135. [https://doi.org/10.9770/IRD.2021.3.1\(7\)](https://doi.org/10.9770/IRD.2021.3.1(7))
- Stankevics, A., Ignatjeva, S., & Mensikovs, V. (2014). Higher education's contribution to economic performance and innovativeness in Latvia: exploratory research. *Economic Annals*, 202(59), 7-41.
- Tian, L., & Liu, N.C. (2018). *Local and global public good contributions of higher education in China*. Working paper no. 37. Retrieved September 10, 2021, from <https://www.researchcghe.org/perch/resources/publications/wp37.pdf>
- Tsvyk, V.A., & Tsvyk, I.V. (2020). Social assessment of technology and humanitarization of engineering in the information society. *RUDN Journal of Sociology*, 20(3), 471-486. <https://doi.org/10.22363/2313-2272-2020-20-3-471-486> (in Russian)
- UNESCO Institute for Statistics (2002). *Proceedings of the International Symposium on Culture Statistics*. Retrieved September 10, 2021, from http://uis.unesco.org/sites/default/files/documents/proceedings-of_the-international-symposium-on-cultural-statistics-2002-en-fre.pdf
- United Nations (2018). *Creative Economy Outlook*. Retrieved September 10, 2021, from https://unctad.org/en/PublicationsLibrary/ditcted2018d3_en.pdf
- World Economic Forum (2016). *The Global Competitiveness Report 2016-2017*. Retrieved September 10, 2021, from https://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf
- World Economic Forum (2017). *The Global Competitiveness Report 2017-2018*. Retrieved September 10, 2021 from <https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018>
- World Economic Forum (2018). *The Global Competitiveness Report 2018*. Retrieved September 10, 2021, from <https://www.weforum.org/reports/the-global-competitiveness-report-2018>
- World Economic Forum (2019). *The Global Competitiveness Report 2019*. Retrieved September 10, 2021, from https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf
- World Economic Forum (2020). *The Global Competitiveness Report 2020*. Retrieved September 10, 2021, from <https://www.weforum.org/reports/the-global-competitiveness-report-2020>
- Yang, Z.S., & Pan, Y.H. (2020). Human capital, housing prices, and regional economic development: Will "vying for talent" through policy succeed? *Cities*, 98, Article Number: 102577 <https://doi.org/10.1016/j.cities.2019.102577>
- Yu, W., Hong, J., Zhu, Y., & Marinova, D. (2014). Creative industry clusters, regional innovation and economic growth in China. *Regional Science Policy & Practice*, 6(4), 329-347. <https://doi.org/10.1111/rsp3.12051>
- Zhang, R., & Zhao, C.P. 2018. research on the correlation model of vocational talents, population structure and economic development. *Wireless Personal Communications*, 102(2), 985-996. <https://doi.org/10.1007/s11277-017-5127-x>
- Zobena, A. (Ed.) (2007). *Latvija. Parskats par tautas attistību 2006/2007. Cilvekkapitāls: mans zelts ir mana tauta?* (Latvia. Human Development Report 2006/2007. Human capital: my gold is my nation?) Riga: LU Sociālo un politisko pētījumu institūts.

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ANALYSIS OF EMPLOYEE MOTIVATION IN SMALL AND MEDIUM-SIZED COMPANIES IN WESTERN SLOVAKIA REGION *

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Abstract. It is important for leaders to ensure that their employees do their best in order to reach organizational goals. One way to achieve this is by implementing motivational systems. An effective leader must be aware of what motivates employees to perform. Motivation gives human behavior a direction and intensity which results in certain rewards that are valuable to the individual. The objective of our research was to analyze the effects of motivational factors. In the Slovakian economy, nearly 60 percent of employees are employed by small and medium-sized enterprises, which makes them highly significant. They play an important role in reducing unemployment and the development of the local economy both on a national and on a regional level. In addition, we feel there has only been a small number of studies conducted regarding the factors of internal motivation of small and medium-sized enterprises employees. With this objective in mind, based on the data we collected, we would like to set up a model for the organizations concerned that is easy to comprehend and enables the leaders to get a comprehensive picture about which motivating factors have a relevant impact on the motivation of their employees.

Keywords: extrinsic and intrinsic motivational factors; employee's motivation; small and medium-sized enterprises; Slovakia

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1. Introduction

A number of definitions are used in the literature with regard to motivation. The literature is not settled on a single unified definition of motivation; a reason for this is the degree of complexity of the motivational systems. The most important motivational theories are namely Maslow's hierarchy of needs, Alderfer ERG theory, Herzberg's two-factor theory, Locke goal setting theory, McClelland expectancy value theory and Vroom's theory. On an organizational level, motivation is carried out by leadership with the goal of getting others to act and increase their efficiency in order to reach the desired outcome (Aliekperova, 2018).

According to Pinder (1984), motivation in the workplace is the set of external and internal influences connected to work that affect work-related behavior - determining its form, intensity, duration, and direction. Lindner (1998) found that motivated employees are more productive. For this reason, managers need to develop an understanding of what motivates employees. This is unquestionably one of the most complex leadership mission (Kovach, 1987; Smerek & Šurinčíková, 2020).

Karácsony (2017) argue that a correct application of positive motivation is crucial for leaders working in the current, ever-changing business environment because it is essential for them to stay ahead of their competition. The motivation can be separated into intrinsic and extrinsic motivation. Amabile (1993) explains this as follows. Individuals are intrinsically motivated when they seek interest, self-expression, or personal challenge in the work. Individuals are extrinsically motivated in the work in order to obtain some goal (Fila et al., 2020).

The object of the research is designed to investigate what the basic motivating factors are that help facilitates the motivation of employees so that they perform in the organization as well as possible.

Furthermore, we also seek to establish if there exists a difference between the motivating factors that affect the motivation of physical workers and the factors, which influence that of intellectual workers. Since there is a great number of factors studied in our questionnaire, we grouped these into six basic pillars: *payment, non-financial benefits, nature of the job, self-realization, leadership, workplace atmosphere*. The analyses have also shown that physical workers and intellectual workers have different preferences with regard to the individual factors – there are factors that have a strong influence on both groups and also others which seem to have an effect only on one group or the other.

2. Literature review

Job satisfaction is a psychological concept referring to attitudes and characteristics relating to the job such as wage and rewards, company policy, work environment, career opportunities and self-realization (Dartey and Harley, 2010; Tóth and Mura, 2014; Aliyu et al., 2020). Wages are one of the most important factors in terms of job satisfaction (Bryan and Sell, 2011, Vel'misova, 2019; Valent, 2019; Maris, 2021). Wages are a kind of reward in work besides recognition and future opportunities (Clark and Oswald, 1996). In addition to financial motivators, employees are also motivated by promotion opportunities and greater responsibility (Vlacsekova and Mura, 2017). Nabi (2000) defined career-oriented motivation as advancement motivation and the importance of the job. This means that a career-oriented person has a strong desire for professional growth and as a result of this he gets a higher level of satisfaction from work (Peracek et al., 2020). According to Karácsony and Machová (2015), there are numerous critical factors to a successful motivation system. The size of the reward should be big enough to influence employee behavior because a too small reward does not motivate.

The important aims of having motivation systems are formulated by Arvidsson (2004) as management control, motivating employees to perform as desired and recruiting and keeping employees. Since the aims of the employees frequently diverge from the aims of the organization, the role of management control is to ensure that the personal aims of the employee are at least partly identical to those of the organization (Mura et al., 2019). At the same time, management control is also aimed at ensuring the achievement of high organizational productivity and efficiency in the activities carried out (Manolopoulos, 2007). According to Arvidsson (2004), the second aim of motivating employees can be reached, in part, if the employees value the reward that they get when the desired result is reached. Poór et al. (2017) believe that payment is a part of the motivation system, but because it is an obvious corollary to any work, it is likely not so important as are incentives of other types because employees automatically expect to get paid. In this regard, the importance of other forms of compensations and benefits is also high (Witkowska & Kompa, 2020) especially if they cause the positive perception of social protection by means of motivation system within the enterprise (Mishchuk et al., 2020). Based on the fact that individuals react to various incentives differently, it is a crucial factor to introduce rewards that motivate as many employees as possible (Sinambela, 2020). Such approach leads to overall increase of satisfaction with working environment (Martínez-Buelvas et al., 2021). Therefore, these aspects are typical objects of social dialogue in enterprises (Bilan et al., 2019). The third aim of motivation systems is recruiting and keeping employees (Breaugh, 2008). In today's labor shortage environment, it is essential for the organization to be an attractive employer to the potential employees found in the labor market (Leete, 2000; Marisova & Maris, 2015).

3. Methodological approach

Our study involved the application of descriptive research methods with the goal of giving an account of the motivational tools used by small and medium-sized enterprises in Western Slovakia Region, their effectiveness and effects on employee job satisfaction.

To collect qualitative data, we chose the questionnaire method, the method that is the most widely used to collect primary data in social science research. As a first step in the process of preparing the questionnaire, we were looking for indicators - we conducted four focus group discussions with employees of various organizations we had selected, with 10 people participating in each discussion. During the discussions, we talked to the employees about their job satisfaction in general, focusing on the topics related to motivation. We constructed the first version of our questionnaire after the discussions - the structure of the questionnaire was decided, the type of the questions chosen, then the order of the questions and the logical layout of the questionnaire established. We used the following question types in the questionnaire:

- simple or multiple selection, with the answer variables evaluated using nominal or ordinal scales,
- five-point Likert scale items, with the answer variables further evaluated using an interval scale (we would also like to point out that the literature is unsettled on the level of measurement of Likert scales with some researchers evaluating the variables using ordinal scales and others using interval scales).

The data were collected among 45 Slovakian small and medium-sized enterprises. The enterprises involved were selected randomly, they were contacted personally. During data collection, 543 questionnaires were filled out. The resulting data provides an opportunity to thoroughly examine the topic. The data were collected about:

- 17 small enterprises (number of questionnaires filled out: 235)
- 28 medium-sized enterprises (total number of questionnaires filled out: 308)

After data collection, the questionnaires were checked for errors and validated. In this phase, we decided to ignore the unclear and the logically incompatible answers and, in the interest of creating a better database, to treat these as missing data in the later phases. This was followed by questionnaire coding and data entry, data preparation and addressing inaccuracies in the coding.

In the main part of our work, we aimed to create a motivational model using multiple regression analysis, separately for physical workers and separately for intellectual workers. We used our regression analysis primarily to find out, to what degree do the studied motivating factors strengthen (or possibly weaken) each other's effects and to what degree can the combined effect explain variances in motivation. During the analysis, we also looked at the F statistic found in the ANOVA tables which - if significant - confirms the relationship between the variables. In the further phases of the analysis, we studied the influence of each factor on the variance of motivation using the beta values, where these values are significant in terms of the model.

4. Empirical results

Demographic characteristics can be a significant factor when researching employees' motivation, four of these characteristics are analyzed. These demographic characteristics are gender, age, academic degree, and work experience in the company. Our questionnaire was filled out by N=543 respondents from amongst the employees of Slovakian small and medium-sized enterprises. In terms of gender 300 respondents were women, 241 were men and 2 questionnaires did not include an indication of the respondent's gender. In terms of age, 50.45 percent of respondents (274 persons) declared themselves to be under 40 years, while 48.25 percent (262 persons) over 40 years with 1.29 percent (7 persons) not declaring their age. The most respondents (153 persons) are between 41 and 50 years, followed by those between 30 and 40 years (138 persons). The age group with the smallest representation in the sample (54 persons) was the group between 18 and 25 years of age. If we take a look at the educational background of the respondents, most of them, 254 persons have finished their secondary education. The following group is the respondents with a university qualification (149 persons). Those who finished primary school (135 persons) make up below 25 percent of the respondents and are mainly from the older age groups. 5 people in the sample did not declare their educational background. It was found that 34.07 percent (185 persons) of the employees had 6 to 10 years of experience, while 20.07 percent (109 persons) had more than 10 years of work experience. 16.02 percent (87 persons) and 29.83 percent (162 persons) of the respondents had 0 to 1 year of experience and 2 to 5 years of experience respectively (Table 1).

Table 1. Demographic characteristics of respondents

Gender	Frequency	Percent
female	300	55,25
male	241	44,38
missing	2	0,37
Education level		
primary school	135	24,86
secondary school	254	46,78
university	149	27,44
missing	5	0,92
Age		
18-25	54	9,94
26-30	82	15,10
31-40	138	25,41
41-50	153	28,18
51-	109	20,07
missing	7	1,29
Work experience		
0-1 year	87	16,02
2-5 years	162	29,83
6-10 years	185	34,07
more then 10 years	109	20,07

Source: own research, 2020

In the following part of our research, we examine the factors of the basic motivational pillars. The first basic pillar is the rate of *financial factors (payment)*. Our assumption that we will find a relevant positive correlation with financial factors in the case of both physical and intellectual employees. Based on the sample tested, we can conclude that payment rates have a relevant impact on the motivation of both the physical and the intellectual workers to perform their job activities better. The correlation test had a similar result with regard to both groups, the value of the Pearson correlation coefficient is 0.376 and 0.366, respectively, which implies a moderate positive correlation between the two variables, which is confirmed by the results even at a $p < 0,000$ significance level. The difference between the physical workers and the intellectual workers is not relevant, so we did not perform any confirmatory analyses, but accepted that the rate of payment has a similar impact for both groups.

Non-financial benefits also have a significant impact on the level of employee motivation. In Slovakian small and medium-sized enterprises, non-financial benefits (opportunities for further training, contributions to the holiday expenses of employees, healthcare benefits etc.) have an influence in the case of physical workers and also in the case of intellectual workers. The value of the Pearson correlation coefficient was 0.310 in the case of physical workers, while 0.347 correlation coefficient was identified based on the answers of intellectual workers; both results show a moderate positive correlation. We got the results at a $p < 0,000$ significance level.

The next studied factor concerned the *nature of the job* in the framework of which we examined two levels of satisfaction related to the nature of the job. In terms of the nature of the job, we did not find a significant relationship in the case of either factor, neither among physical workers nor among intellectual workers. Nevertheless, there are observable differences between the employees hired for physical work and those hired for intellectual work, because in the case of the physical worker's data indicate a significant ($p = 0,003$) but weak correlation between the workload and motivation. The influence of the workload on the individual groups is also worth noting, for which we have observed a negative correlation among employees hired to do intellectual work. On the other hand, it is also worth highlighting that because these relationships are weak, the results should only be treated as indicative information and that we should not draw significant conclusions from them.

Self-realization (professional development, autonomy) as a basic motivational pillar warrant more attention in the case of intellectual workers than in the case of physical workers. Despite this fact, we could find relevant differences between the two groups with regard to professional development. The data show the first noticeable result in connection with intellectual workers: a relevant correlation can be identified between their motivation and opportunity for professional development. The correlation is positive; its strength can be characterized by a correlation coefficient of 0.220; the same correlation cannot be observed among employees doing physical work. The opportunity of autonomy does not prove to be a strong motivating factor, but the 0.128 correlation observable among physical workers can, in any case, serve as an indication.

The *leadership* (leadership style, communication, workplace security) is also relevant to motivating factors. The value of the Pearson correlation coefficient in the case of leadership style in both groups shows a weak (physical workers 0.182, intellectual workers 0.173) significant correlation. We can observe a similar correlation in the case of communication with superiors, where both the physical workers (0.282) and the intellectual workers (0.248) show a significant correlation. With regard to workplace security, it was surprising to find a correlation only in the case of physical workers, in which case the strength of the correlation was 0.220, but because of its low significance level, this result does not have a substantial impact on the further stages of the study.

The Pearson correlation coefficient for the *workplace atmosphere* factor is 0.257 for physical workers, while among the intellectual workers shows a weak (0.158) correlation with a $p < 0,000$ significance level. Because of its weakness, it does not considerably impact our research results. The workplace atmosphere does not have a motivating influence on intellectual employees, and so these we rendered irrelevant in terms of further analysis.

As shown above, the motivational factors of Slovakian small and medium-sized enterprises have different effects on employees. Based on the results of the correlation analyses built on these, we got an adequate overview of the effects the motivating factors. *The main objective of our research was to make a motivational model for Slovakian small and medium-sized enterprises.* In the following part, we will build on this and use a multiple regression model to find which factors have a significant impact on employee motivation. Given the high number of factors studied so far, we only include those factors in our regression model that we observed to show a relationship stronger than 0.2. In the following part, we made a separate model for the group of physical workers and a separate one for the group of intellectual workers.

Table 2. Model of motivation for physical workers - a descriptive statistical summary

	Mean	Std. Deviation	N
Motivation	3,32	1,217	259
Work organization	3,49	0,925	259
Payment	3,40	1,236	259
Non-financial benefits	2,88	1,190	259
Workplace atmosphere	3,64	0,919	259
Communication with superiors	3,56	0,976	259
Communication with colleagues	4,34	0,792	259
Workplace stability and security	4,11	0,835	259

Source: own research, processed in: IBM SPSS 25

Table 2. shows the factors that we have determined to be strong motivating factors for the group of physical workers by applying the logic described above. Based on the satisfaction indices related to the individual factors, they are most satisfied with communication with colleagues and generally consider their current job stable and reliable. The other side is represented by satisfaction with the payment and non-financial benefits - these factors got the lowest ratings.

We used the regression calculation to find an answer to what degree the studied motivating factors can the combined effect of these factors explain in employees' motivation.

Table 3. Regression summary table

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.585 ^a	0,342	0,324	1,001

a. Predictors: (Constant), Work organization, Payment, Non-financial benefits, Workplace atmosphere, Communication with superiors, Communication with colleagues, Workplace stability and security

Source: own research, processed in: IBM SPSS 25

Table 3 gives a summary of our model. It is visible even at first glance that the effects of the variables included in the regression process strengthen each other; the value of the overall correlation coefficient (R) is 0.585, which implies a stronger than average positive correlation. In our case, this means that if the satisfaction indices of the individual increase, then it positively impacts the motivation of physical workers. The next significant index of the summary is the coefficient of determination (since we are using multiple regression analysis, we calculate

based on the adjusted R square) which shows a remarkable value of 0.324, that is to say that the factors included in the model have the power to explain 32 percent of the variation in motivation. In the following part, we will examine the results in more detail.

Table 4. The one-way analysis of variance (ANOVA) of the model of motivation for physical workers

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	130,631	7	18,662	18,631	.000 ^b
	Residual	251,407	251	1,002		
	Total	382,039	258			

a. Dependent Variable: Motivation

b. Predictors: (Constant), Work organization, Payment, Non-financial benefits, Workplace atmosphere, Communication with superiors, Communication with colleagues, Workplace stability and security

Source: own research, processed in: IBM SPSS 25

The results are shown in the ANOVA table (Table 4) give further support to the existence of the aforementioned relationship. The F-test significance is $p < 0.000$.

Table 5. Model of motivation for physical employees - coefficient table (Coefficients)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2,397	0,571		-4,200	0,000
	Work organization	0,187	0,069	0,142	2,696	0,007
	Payment	0,227	0,060	0,231	3,760	0,000
	Non-financial benefits	0,163	0,062	0,160	2,627	0,009
	Workplace atmosphere	0,286	0,069	0,216	4,120	0,000
	Communication with superiors	0,234	0,065	0,188	3,580	0,000
	Communication with colleagues	0,191	0,081	0,124	2,355	0,019
	Workplace stability and security	0,271	0,077	0,186	3,545	0,000

a. Dependent Variable: Motivation

Source: own research, processed in: IBM SPSS 25

We continue with an analysis of the effect of the individual factors (Table 5). As it is shown, the significance levels of all studied factors are below the 0.05 limit, which suggests that as a result of the regression process we can reach the statement that all factors included have a considerable influence on the level of motivation of the respondent physical workers. We analyze the strength of the relationships with the help of the beta, based on which payment (0.231) has the strongest influence followed by the workplace atmosphere (0.216) and communication with superiors (0.188).

After analyzing the group of physical workers, we also analyzed the motivational factors for the group of intellectual workers. Similarly to the previous part, we begin by dealing with the factors that the correlation analyses have shown to have a strong relationship with the motivation of employees.

Table 6. Model of motivation for intellectual workers - a descriptive statistical summary

	Mean	Std. Deviation	N
Motivation	3,33	1,186	261
Work organization	3,66	0,937	261
Recognition of work	3,94	0,862	261
Payment	3,58	1,126	261
Non-financial benefits	3,64	1,147	261
Opportunity for professional development	3,72	0,959	261
Communication with superiors	3,96	0,887	261

Source: own research, processed in: IBM SPSS 25

Some motivational factors show similar data to those in the case of physical workers - two examples are payment and non-financial benefits which seem to be significant influences for this group as well (Table 6). On the other hand, we can see two factors that did not show a relevant effect on the previous group. These are recognition of work and opportunity for professional development. In the following part, we try to answer our question about the degree to which these factors are – taken together – able to affect the motivation of intellectual workers.

Table 7. Regression summary table

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.504 ^a	0,254	0,237	1,037

a. Predictors: (Constant), Work organization, Recognition of work, Payment, Non-financial benefits, Opportunity for professional development, Communication with

Source: own research, processed in: IBM SPSS 25

The overall correlation coefficient - similarly to that observed for the first group - indicates a moderately strong positive relationship (Table 7), so we can conclude that the factors included in the model strengthen each other's influence in this case too. However, the value of the coefficient of determination is significantly lower than in the case of physical workers – our model is able to account for nearly 24 percent of the variance in motivation, which is still a remarkable result.

Table 8. The one-way analysis of variance (ANOVA) of the model of motivation for intellectual workers

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	93,076	6	15,513	14,437	.000 ^b
	Residual	272,924	254	1,075		
	Total	366,000	260			

a. Dependent Variable: Motivation

b. Predictors: (Constant), Work organization, Recognition of work, Payment,

Non-financial benefits, Opportunity for professional development, Communication with superiors

Source: own research, processed in: IBM SPSS 25

The ANOVA table (Table 8) also contains significant results based on which the F-test significance is $p < 0.000$, which in our case gives further confirmation to the existence of the relationship between the variables. Finally, we give a detailed analysis of the regression model.

Table 9. Model of motivation for intellectual employees - coefficient table (Coefficients)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0,480	0,446		-1,077	0,283
	Work organization	0,207	0,074	0,164	2,799	0,006
	Recognition of work	0,161	0,082	0,117	1,965	0,051
	Payment	0,132	0,091	0,126	1,448	0,149
	Non-financial benefits	0,199	0,089	0,192	2,242	0,026
	Opportunity for professional development	0,169	0,069	0,136	2,436	0,016
	Communication with superiors	0,151	0,077	0,113	1,963	0,051

a. Dependent Variable: Motivation

Source: own research, processed in: IBM SPSS 25

As the data indicate, the figures of this group are less clear in comparison to those relating to the physical workers. There are several motivating factors that show non-significant results, from which we can infer that they (in joint analysis with other factors) do not have a relevant impact on motivation (Table 9). Such a factor was shown to be the payment, the beta for which indicates a strong correlation, but not significant in terms of our model. Another two factors also fell outside our accepted 5 percent alpha. These are the recognition of work and communication with superiors. Here it is also important to note that these factors were just above our acceptance range. However, our analysis appears to suggest strong correlations with non-financial benefits (0.192) and opportunity for professional development (0.136) which are indicated in our motivational model as significant influences.

Conclusions

Motivated employees can bring great improvements to the efficiency of small and medium-sized enterprises. Motivation is, therefore, crucial to properly influence employees' behavior in order to achieve the goals of the business. In addition to all of this, motivation is related to a number of other factors, such as workplace

atmosphere, leadership behavior, leadership style or organizational commitment. We aimed to study a topic the results of which could be used to develop small and medium-sized enterprises in Western Slovakia Region because their efficient operation is beneficial economically and serves the interests of the local community.

Using the model of motivation that was set up in order to fulfill the primary objective of our study, we can make the following new or novel findings:

1. For the group of physical workers, the significance level for all studied factors is under the 0.05 limit, so all studied motivational factors have a relevant impact on their motivation.
2. In the case of the motivational factors investigated in relation to intellectual workers, payment, recognition of work and communication with superiors are not significant, which leads us to conclude that these (in joint analysis with other factors) do not have a relevant impact on their motivation (Table 10).

Table 10. Model of Slovakian employee's motivation - aggregated table of coefficients

		Beta	Sig.
Physical workers	Payment	0,231	0,000
	Workplace atmosphere	0,216	0,000
	Communication with superiors	0,188	0,000
	Workplace stability and security	0,186	0,000
	Non-financial benefits	0,160	0,009
	Work organization	0,142	0,007
	Communication with colleagues	0,124	0,019
Intellectual workers	Non-financial benefits	0,192	0,026
	Work organization	0,164	0,006
	Opportunity for professional development	0,136	0,016
	Payment	0,126	0,149
	Recognition of work	0,117	0,051
	Communication with superiors	0,113	0,051

Source: own research, processed in: IBM SPSS 25

We used the beta to examine the strength of the relationships, which indicates that, for physical workers, payment (0.231) and workplace atmosphere (0.216) have the strongest influence, while communication with colleagues has the weakest (0.124). For the intellectual workers, the strongest factors were non-financial benefits (0.192) and work organization (0.164). Since we excluded three factors based on their significance levels, the factor that exerts the weakest influence is the opportunity for professional development (0.136).

Table 11. Summary of the regression tables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Physical workers	.585 ^a	0,342	0,324	1,001
Intellectual workers	.504 ^a	0,254	0,237	1,037

Source: own research, processed in: IBM SPSS 25

The regression models presented above (Table 11) are able to explain 32.4 percent and 23.7 percent of the variation of motivation, respectively, which we consider a relevant result. The factors excluded are such sociological, psychological and economic factors that are outside the scope of our model, but that exerts a significant influence on the changes in the motivation of employees.

We believe the topic we investigated and the model of motivation that we set up will be of help to Slovakian small and medium-sized enterprise leaders in achieving higher efficiency and better organizational performance. It was our aim to set this model up so that it is generally easily comprehensible to Slovakian small and medium-sized enterprises and by doing so to help them increase their competitiveness. In our estimation, the model offers an opportunity for the studied sector to make a step forward.

References

- Aliekperova, N. 2018. Motivating factors effecting work efficiency of employees in Ukrainian pharmaceutical sector. *Economics and Sociology*, 11(1), 61-74. <https://doi.org/10.14254/2071-789X.2018/11-1/4>
- Aliyu, M. O., Akinwale, A. A., & Shadare, A. O. 2020. Psychological contracts and discretionary behaviour in Nigerian academics. *Acta Oeconomica Universitatis Selye*, 9(1), 24-44. <https://doi.org/10.36007/Acta.2020.9.1.2>
- Amabile, T. M. 1993. Motivational synergy: toward new conceptualizations of intrinsic and extrinsic motivation in the workplace. *Human Resource Management Review*, 3(3), 185-201.
- Anita, R. Fedor (2021). Job satisfaction in Hungary – comparative study. *Economics and Sociology*, 14(2), 331-349. <https://doi.org/10.14254/2071-789X.2021/14-2/18>
- Armstrong, M. 2002. *Employee reward*. Chartered Institute of Personnel and Development. London
- Arvidsson, P. 2004. *Styrning med beloningssystem Samuelsson*. Nya Almqvist & Wiksell Tryckerii AB. Uppsala, pp. 135-171.
- Bilan, S., Mishchuk, H., Samoliuk, N. & Ostasz, G. (2019). Effectiveness of Social Dialogue in the System of Sustainable Economic Development Factors. *Paper presented at the Proceedings of the 34th International Business Information Management Association Conference, IBIMA 2020: Vision 2025: Education Excellence and Management of Innovations through Sustainable Economic Competitive Advantage*, 13303-13313.
- Breaugh, J. 2008. Employee recruitment: Current knowledge and important areas for future research. *Human Resource Management Review*, 18(3), 103-118. <https://doi.org/10.1016/j.hrmr.2008.07.003>
- Bryan, C. & Sell, L. 2011. Job Satisfaction, Work Environment, and Rewards: Motivational Theory Revisited. *Labour*, 25, 1-23. <https://doi.org/10.1111/j.1467-9914.2010.00496.x>
- Clark, A.E. & Oswald, A.J. 1996. Satisfaction and Comparison Income. *Journal of Public Economics*, 61, 359-382. [https://doi.org/10.1016/0047-2727\(95\)01564-7](https://doi.org/10.1016/0047-2727(95)01564-7)
- Dartey, B. K. & Harley, A. 2010. Job Satisfaction and Motivation: Understanding its impact on employee commitment and organizational performance. *Academic Leadership: The Online Journal*, 8(4), 4-9.
- Fila, M., Levicky, M., Mura, L., Maros, M., & Korenkova, M. 2020. Innovations for Business Management: Motivation and Barriers. *Marketing and Management of Innovations*, 4, 266-278. <http://doi.org/10.21272/mmi.2020.4-22>
- Karácsóny, P. 2017. The Analyze of the employee's motivation methods in environmentally friendly organizations. *International Journal of Ecology and Development*, 32(3) 119-128.
- Karácsóny, P. & Machová, R. 2015. *Comparison of the Employee Motivational Tools in Industrial Companies*. In: Peter, Nijkamp; Karima, Kourtiti; Milan, Buček; Oto, Hudec (eds.): 5th Central European Conference in Regional Science. International Conference Proceedings. Technical University of Kosice, Slovakia, pp. 346-350.

- Kovach, K.A. 1987. What motivates employees? Workers and supervisors give different answers. *Business Horizons*, (30), 58-65.
- Leete, L. 2000. Wage equity and employee motivation in nonprofit and for-profit organizations. *Journal of Economic Behavior & Organization*, 43(4), 423-446.
- Linder, J.R. 1998. Understanding employee motivation. *Extension Journal*, 36(3), 75-92.
- Manolopoulos, D. 2007. An evaluation of employee motivation in the extended public sector in Greece. *Employee Relations*, 30(1), 63–85. <https://doi.org/10.1108/01425450810835428>
- Maris, M. 2021. New emerging population and settlement patterns: the case of Slovakia. *13th World Congress of the RSAI: Smart regions - Opportunities for sustainable development in the digital era: proceedings virtual conference*. Angra do Heroísmo: Regional Science Association International, 889-900.
- Marisova, E. & Maris, M. 2015. Labor specialization and its impact on spatial patterns of unemployment. *Gazdaság & Társadalom*. Sopron: Nyugat-magyarországi Egyetem Kiadó, 7(1-2), 39-57
- Martínez-Buelvas, L., Jaramillo-Naranjo, O., & De la Hoz-Dominguez, E. 2021. Factors that affect quality of work life of the millennials linked to the commercial sector in Colombia. *Economics and Sociology*, 14(2), 71-84. <https://doi.org/10.14254/2071-789X.2021/14-2/4>
- Mishchuk, H., Bilan, S., Yurchyk, H. & Sułkowska, J. (2020). Social Protection of Employees as A Tool of Social Responsibility and Increase of Business Efficiency *Proceedings of the 35th International Business Information Management Association (IBIMA)*, ISBN: 978-0-9998551-4-0, 1-12 April 2020, Seville, Spain, p. 9459-9469.
- Mura, L., Gontkovicova, B., Dulova Spisakova, E. & Hajduova, Z. 2019. Position of Employee Benefits in Remuneration Structure. *Transformations in Business & Economics*, 18(47), 156-173.
- Nabi, G.R. 2000. Motivational Attributes and Organizational Experiences as Predictors of Career-enhancing Strategies. *Career Development International*, 5(2), 91-98. <https://doi.org/10.1108/13620430010318963>
- Peracek, T., Vilcekova, L. & Strazovska, L. 2020. Selected Problems of Family Business: A Case Study from Slovakia. *Acta Polytechnica Hungarica*, 17(7), 145-162. <https://doi.org/10.12700/APH.17.7.2020.7.8>
- Pinder, C. 1984. *Work Motivation: Theory, Issues, and Applications*. Glenview: Scott, Foresman and Company
- Poór, J., Vinogradov, Sz., Tózsér, G. Gy. , Antalík, I., Horbulák, Zs., Juhász, T., Kovács, I. É., Némethy, K. & Machová, R.. 2017. Atypical Forms of Employment on Hungarian-Slovakian Border Areas in Light of Empirical Researches. *Acta Polytechnica Hungarica*. 14(7), 123-141. <https://doi.org/10.12700/APH.14.7.2017.7.8>
- Sinambela, S. 2020. The Effect of Workload on Job Stress, Work Motivation, and Employee Performance. *International Journal of Psychosocial Rehabilitation*, 24(04), 1373–1390. <https://doi.org/10.37200/ijpr/v24i4/pr201109>
- Smerek, L. & Šurinčíková, M. 2020. Perception of leadership in Slovakia. *Acta Oeconomica Universitatis Selye*, 9(2), 93-105. <https://doi.org/10.36007/Acta.2020.9.2.7>
- Tóth, Z. & Mura, L. 2014. Support for small and medium enterprises in the economic crisis in selected EU countries. *Hradec Economic Days 2014: Economic Development and Management of Regions*, PT V, 424-429
- Valent, Á. 2019. Analysis of the motivational factors affecting university choice of ethnic Hungarian secondary school students from Slovakia. *Acta Oeconomica Universitatis Selye*, 8(2), 68-78
- Vel'misova, D.V. 2019. Value and motivational aspects of employee personality in the monetary and financial sector. *Economics and Management*, (6), 95–101. <https://doi.org/10.35854/1998-1627-2019-6-95-101>
- Vlacsekova, D. & Mura, L. 2017. Effect of motivational tools on employee satisfaction in small and medium enterprises. *Oeconomia Copernicana*, 8(1), 111. <https://doi.org/10.24136/oc.v8i1.8>
- Witkowska, D. & Kompa, K. 2020. Motherhood and eldercare penalties. Evidence from Poland. *Economics and Sociology*, 13(3), 11-26. <https://doi.org/10.14254/2071-789X.2020/13-3/1>

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SUCCESS FROM THE PERSPECTIVE OF FEMALE ENTREPRENEURS *

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Abstract. The research in the field of entrepreneurial activity is increasing. In addition to classical economic definitions, researchers are trying to capture this phenomenon in subjective terms. Some research focuses on the fact that female entrepreneurs cannot be examined purely on the basis of economic factors, since subjective factors are in many cases more important for women. Within the framework of this study, we are trying to define how female entrepreneurs in Slovakia interpret the concept of success, as well as explore the relationship between subjective and objective success factors. We used a combined research method to answer all these questions, so we conducted a questionnaire survey and in-depth interviews were applied as a qualitative part of the research. Our results confirmed the conclusions of previous research focusing on subjective, so-called non-economic goals. It has been confirmed from both quantitative and qualitative perspective that independence gives female entrepreneurs the opportunity to have free time and therefore can perform their family responsibilities more flexibly, which results in being satisfied with their private life. In addition to independence, female entrepreneurs are also proved to be satisfied if they are successful in meeting the objectives they set to achieve by the business they lead. Thus, independence and achievement of goals contribute to personal and corporate satisfaction. Together with the achievement of company goals, female entrepreneurs feel successful when their business is constantly evolving. Our research analyses shows that the subjective factors we measured, the factors that do not directly contribute to the entrepreneur's internal satisfaction are economic and objective factors.

Keywords: female entrepreneurs; entrepreneurial success; subjective success factors; objective success factors

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JEL Classifications: L25, L26, D91

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1. Introduction and theoretical background

The research in the field of entrepreneurial activity is increasing. In addition to classical economic definitions, researchers are trying to explain this phenomenon in subjective terms (Peráček, 2019; Milovic et al., 2020). Some research activities focus on the fact that female entrepreneurs cannot be examined purely on the basis of economic factors, since subjective factors are in many cases more important for women. There are differences in management, leadership, entrepreneurship, financial and another conditions (Smerek & Šurinčíková, 2020; Sajfert et al., 2019; Machova & Zsigmond, 2019; Dudić, Z. et al., 2020; Oláh et al., 2021; Mihokova et al., 2018; Konecna & Andrejovska, 2020).

Before interpreting the concept of entrepreneurial success, it is essential to clarify the interpretations related to the term 'success'. The Hungarian interpretative dictionary provides the following definition for success: "Action, activity that results in success, completed successfully. Successful action, operation, method, propaganda or enterprise. You have successfully completed the work. He passed the exam successfully" (Arcanum, online). The English interpretative dictionary gave the following definitions for the English term "success":

- *"a favourable or prosperous completion of experiments or endeavors; achieving the objectives;*
- *acquisition of property, situation, respect or the like;*
- *a performance or achievement characterised by success and the awarding of medals;*
- *a person or thing who has had success by achieving the goals". (Dictionary. online)*

Based on the definitions presented above, success as an expression can be considered a positive result of the action/actions performed by the individual.

Entrepreneurial success is a complex phenomenon that does not have a clear definition. Researchers try to define the concept of entrepreneurial success along different variables and from different perspectives (Belas et al., 2020; Dvorsky et al., 2021; Ključnikov et al., 2019; Korcsmáros, 2018). However, they all agree that societies benefit from successful entrepreneurship, and it is important to deal with entrepreneurial success as a concept by defining which variables can be measured (Casson, 2003; Wach & Bilan, 2021).

The intensity of research in the field of entrepreneurial success is presented in the figure below. The number of articles published in Web of Science and Scopus databases is increasing every year. As far as the field of science is concerned, most studies have been published in the field of business and management. 70% of the studies are concentrated in the WoS database in these two fields. 34.2% of the studies are published in Scopus database, and 16.5% are represented in Scopus database.

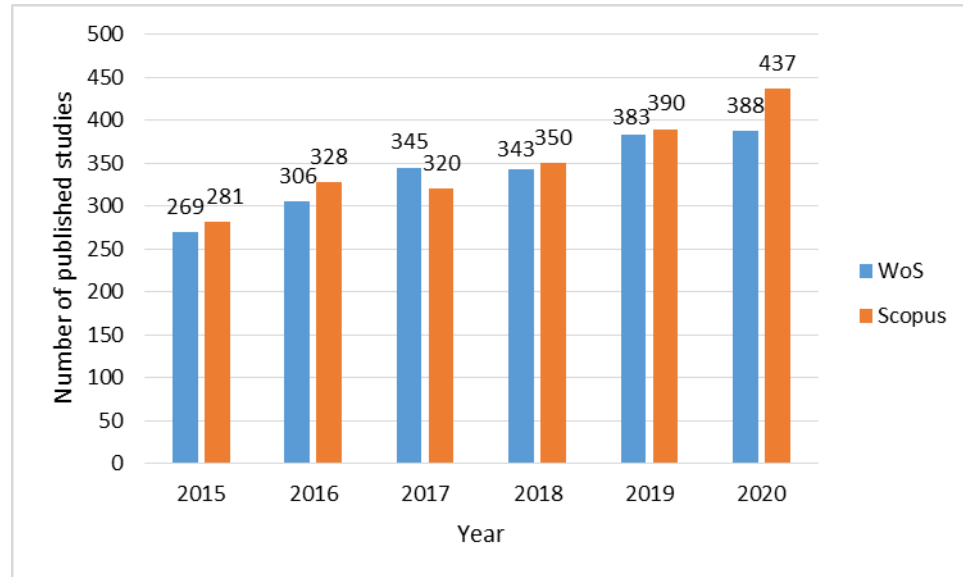


Figure 1. Evolution of the number of studies published in the database on entrepreneurial success between 2015 and 2020

Source: self-editing based on WoS and Scopus database data

When we talk about success in a business context, we mean the successful entrepreneurial activity and the success of the enterprise itself (Crane-Crane, 2007). Entrepreneurial success in research is usually a dependent variable. At the same time, it should be noted that entrepreneurial success can be temporary in terms of time.

Based on the scientific literature, entrepreneurial success can be determined on the basis of indicators, which can be widely displayed. These indicators can have economic, psychological or social nature. Entrepreneurial success can be considered as a complex phenomenon with a number of criteria in financial and non-financial terms and innovativeness (Gorgievski et al., 2010; Orser & Dyke, 2010; Saulius et al., 2020; Hajduová et al., 2021; Ključnikov et al., 2021; Bačík & Gburová, 2016; Pakurár et al., 2020; Zsigmond et al., 2021).

In studies about the success of female entrepreneurs, it is essential to define qualitative factors, as well as define success along subjective non-financial and objective variables. Women mostly run micro-enterprises and operate in the field that may not necessarily be a primary sector of the economy (Weber-Geneste, 2014). Entrepreneurial success cannot be assessed by a single indicator or on the basis of economic indicators. At the initial level of determining success, researchers were trying to define business success with a help of a single metric. Ettl and Welter (2012) believe that entrepreneurial success should be approached from a perspective that includes social, economic and individual aspects. In social terms, a female entrepreneur can be considered successful if her actions bring benefits to society, particularly, contributing to social responsibility regarding employees (Mishchuk et al., 2020), but at the same time she is considered to be successful if her entrepreneurial activity is closely related to her individual motivations or achievement of goals. The perception of goals achievement and used indicators of business success can differ essentially due to the conditions of business activity, determining by entrepreneurial surrounding (Paudel & Devkota, 2018; Saidat et al., 2020).

In their study, Brush and Hisrich examined the factors determining the performance of businesses run by female entrepreneurs. According to the results, the differences in performance of male and female entrepreneurs depend on employee measurements, and emphasize that in addition to financial measures, further indicators have to be considered, which reflect the interactions between the performance, objectives and success (Brush et al, 2006).

The table 1 below summarises the definitions of entrepreneurial success in terms of female enterprises

Table 1. Defining entrepreneurial success in terms of female enterprises

Author/Authors	Entrepreneurial success in female enterprises
Nieman et al. (2003)	Successful female entrepreneurs are those who do business longer than two years, have more than five but less than thirty employees, make profit, and expand in terms of infrastructure.
Ettl-Welter (2012)	Female entrepreneurs cannot be called "unsuccessful" on the basis of financial results of the business.

Source: self-editing based on the definitions of authors

Just as entrepreneurial success itself is a complex phenomenon, therefore the attempt to measure it is not an easy process. When determining indicators, we must take into account what we would like to examine. If we look at entrepreneurial activities in order to achieve entrepreneurial success, we must take into account that entrepreneurial success may vary within certain stages of the lifecycle of the business. Success may be different for the enterprise starting its business activity, business during the period of growth and the business in its declining phase.

Another factor may be the type of the business. Social enterprises do not seek to maximise their profits, and it is therefore not appropriate to measure entrepreneurial success on the basis of financial indicators (Austin et al, 2006). It is much more important for social enterprises to achieve their goals and have an impact on their environment, including impact on local communities (Kostiukevych et al., 2020; Marišová et al., 2021).

In the fisher-maritz-lobo (2014) research, the authors identified individual and macro-level success indicators that show an important relationship between the entrepreneur and the business. This study concluded if entrepreneurs believe in their success, they achieve entrepreneurial success and perceive entrepreneurial success through individual-macro-level variables, both through personal and business performance indicators.

Table 2 summarises the indicators of the most important entrepreneurial success at personal and organizational level (Dej, 2010).

Table 2. Indicators of entrepreneurial success at individual and organisational level

Personal success indicators	Organizational success indicators
Self-realization	Survival of the company
Independence	Number and increase of employees
Financial security/ income	Return on investments
Challenging, interesting tasks	Cash flow
Being your own boss /influence	Sales and their growth
Reputation/prestige	Market share and expansion
Social interactions with employees and customers	Overall corporate performance and growth
Requested service, provision of products	achieve better results than competitors

Source: Dej, 2010

3. Research objective and methodology

In our research, we addressed the following questions: How do female entrepreneurs think about success? Are subjective factors more important than objective ones? Are both factors equally important? The research has a focus to examine the relationship between the subjective and objective success factors.

It focused on female entrepreneurs who have a registered business in Slovakia. It was considered important that individuals who actually run/manage the company should be included in the sample and not merely as 'silent

partners'. Based on these criteria, the target area has been defined as female entrepreneurs as sole owners or co-owners of the business.

Questionnaire survey was applied as a quantitative technique. We found it the most appropriate method to collect quantitative data and perform statistical analysis. A semi-structured interview was applied as a qualitative research method.

Entrepreneurial success was measured on the basis of objective and subjective factors. Subjective success has been captured along personal, entrepreneurial and social dimensions. Our latter variables have been determined on the basis of previous research (Fisher-Maritz-Lobo, 2014) (Arasti - Zandi - Talebi, 2012). The following table 3 summarizes the variables used to measure success. Some variables of subjective success were measured on a 6-point Likert scale.

Table 3. Summary table of success variables

Objective success variables		
Variable Name	Measurement of variables	Measurement level
Age of enterprise	Age of enterprise	ordinal scale
Number of employees	Number of employees	ordinal scale
Subjective success variables		
Variable Name	Measurement level	Measurement level
Personal success1	Satisfaction with private life and business	ordinal scale
Personal success2	Feeling free to work	ordinal scale
Personal success3	Exceeding the objectives set at the time of setting up the business	ordinal scale
Business success1	Developing your business	ordinal scale
Business success 2	Providing quality product/service - satisfied customers, customers	ordinal scale
Financial success1	Company turnover in the period of 2015-2019	ordinal scale
Social success1	Support for local entrepreneurs, organisations and individuals	ordinal scale

Source: own processing

The questionnaire data collection took place two months. A total of 271 questionnaires were filled in by the respondents, while 1 questionnaire was excluded from the evaluation, as it was completed by a male respondent. In the case of qualitative research, it was an important aspect to create a sample represented by different profiles of companies and different age groups of entrepreneurs. We wanted to involve both young and experienced entrepreneurs. The book "49 hrđiniek slovenského biznisu", which presents 49 female entrepreneurs from Slovakia, provided a base for selection of interview subjects. We managed to interview 3 female entrepreneurs and 13 more were addressed. Each interview took 30-40 minutes. We used the SPSS quantitative data analysis software and the NVivo qualitative data analysis tool to process the obtained data.

4. Results and discussion

Defining the concept of success and measuring success is a complex task. Our research focus is greatly influenced by the definition of authors on success presented earlier in this work. When mapping the success of female entrepreneurs, we did not want to evaluate them only on the basis of company performance data, as female entrepreneurs have diverse approach to success. We wanted to know what success means to individual entrepreneurs, as well as examine this phenomenon on the basis of the subjective factors we define.

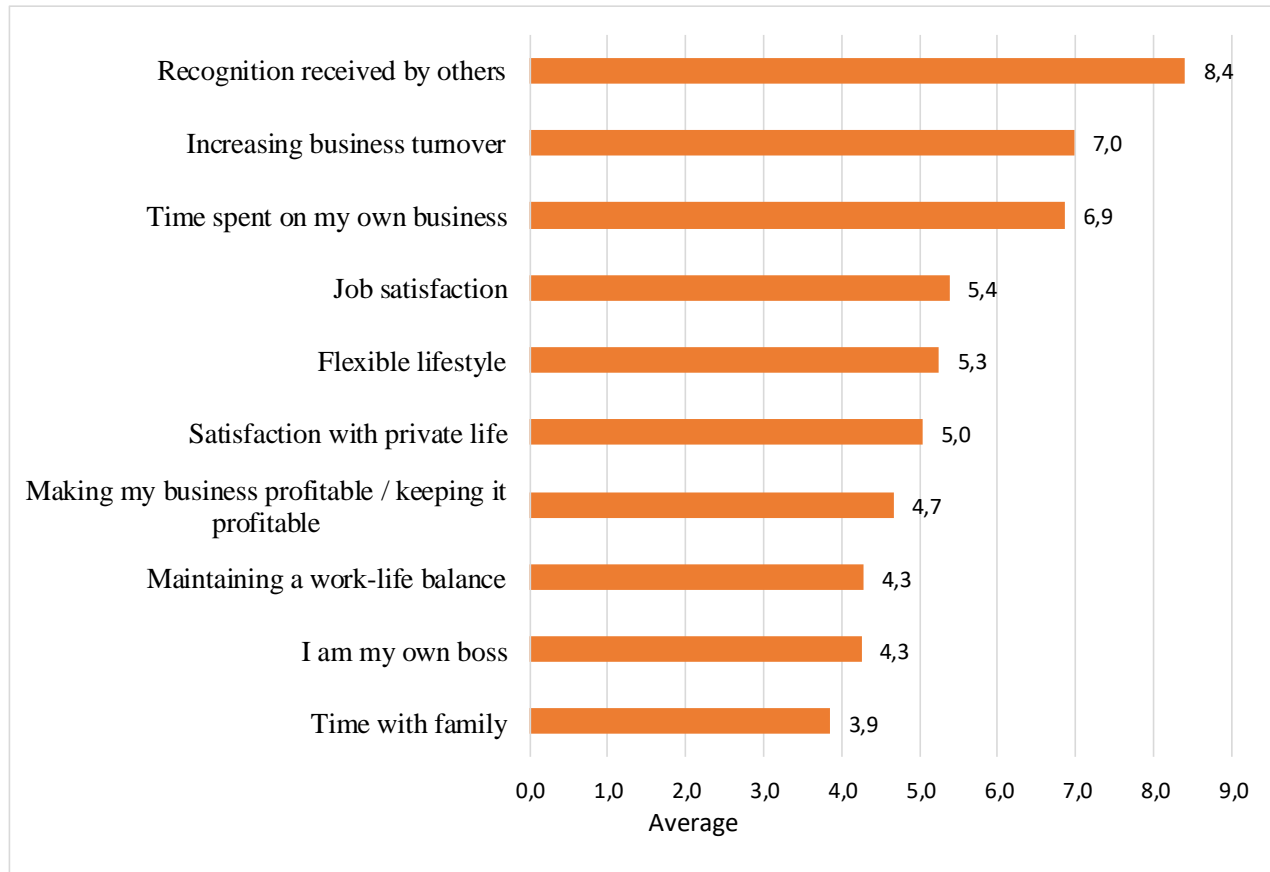


Figure 2. Average preference values of the respondents

Source: own primary research and calculation

The success of businesses is often measured via financial indicators, but some previous studies have shown that female entrepreneurs do not necessarily consider the profitability of the business and the increase of turnover to be the primary concern. Our questionnaire asked the female interviewees to rank those 10 factors we have listed based on the importance. The most important factor came first. The figure below shows the average values calculated for each preference based on the aggregated data of the respondents. Based on the values, we can see that the most important for the sampled respondents is to spend time with their family, maintain healthy work-life balance and manage their own time to define their tasks. Making the company profitable is ranked 4th in terms of average values, and increasing the turnover of the enterprise is in 9th place. The last is the recognition received from others. It means that recognition at social level is not important for the female entrepreneurs involved in the survey. At the same time, it is important to note that the opinion of the respondents on this issue is not uniform, since the value of the standard deviation is high for all factors.

In addition to individual preferences, success has been measured along 6 additional variables, the aggregate results of which are illustrated in the table below. The research made difference between *thinking about success* and *feeling successful*, so we measured both phenomena along 6-6 variables. The respondents were provided a 6-point scale to express in what extent they agree with the provided statement. The lowest value on a scale - 1 expressed the absolute disagreement with the statement, while 6 means absolutely agree.

Table 4. Thinking about success and feeling successful

Factors	Thinking about success - average value	Sense of success in the present - average value	IDEAL value
If I am happy with my personal life and business.	5,28	5,13	6
If I can do what I love in my life and business.	5,44	5,28	6
If my business is constantly evolving.	5,35	5,13	6
If I managed to go beyond the goals I set when I started the business.	5,01	4,90	6
If my customers / clients are satisfied.	5,63	5,53	6
If I create a job for the local community.	4,02	3,73	6
Estimate			
Factors	The combined value of a sense of success and thinking about success	Thinking about success - ideal value	Difference
If I am happy with my personal life and business.	27,1	31,7	5
If I can do what I love in my life and business.	28,7	32,6	4
If my business is constantly evolving.	27,4	32,1	5
If I managed to go beyond the goals I set when I started the business.	24,5	30,1	6
If my customers / clients are satisfied.	31,1	33,8	3
If I create a job for the local community.	15,0	24,1	9

Source: primary research and calculation

We believe that thinking about success and feeling successful should not be treated separately, but should be analysed jointly. Thus, we determined the combined value of the experience of success and thinking about success. We also calculated the ideal value of thinking about success, which we obtained by multiplying thinking about success by ideal value. The “difference column” in the table 4 shows the extent to which the combined value of thinking and feeling about success differs from the ideal value of thinking about success.

Based on the table, we can say that the average values of thinking about success and the feelings associated with success move together. The most important for those surveyed is the customer in general, the satisfied customer, and the entrepreneurial freedom. The latter factor was ranked prominently in the ranking of previous preferences in relation to the variable *I am the "master" of myself*.

When examining success, we wanted to find out the relationship between the different success variables. We were interested in the relationship between objective and subjective variables. In order to answer this question, we performed a correlation calculation and applied the Spearman rank correlation.

Positive significant relationship was found between the subjective factors (indicated with orange in Figure 3). In addition to positive relationship, we found a strong connection between private life, business satisfaction and between what I want to do in my life ($r_s=0.651$; $p<0.01$) and overperforming the goals ($r_s=0.633$; $p<0.01$). The following variable pairs were characterized by a medium relationship:

- private life and business satisfaction – my business is constantly evolving ($r_s=0.465$; $p<0.01$);
- I can do what I want in my life and business – my business is constantly evolving ($r_s=0.524$; $p<0.01$); exceeding targets ($r_s=0.579$; $p<0.01$); satisfied with my customers ($r_s=0.408$; $p<0.01$).

We found a weak positive relationship between job creation and other subjective success factors. We also examined the relationship between objective economic and subjective non-economic factors and subjective economic factors.

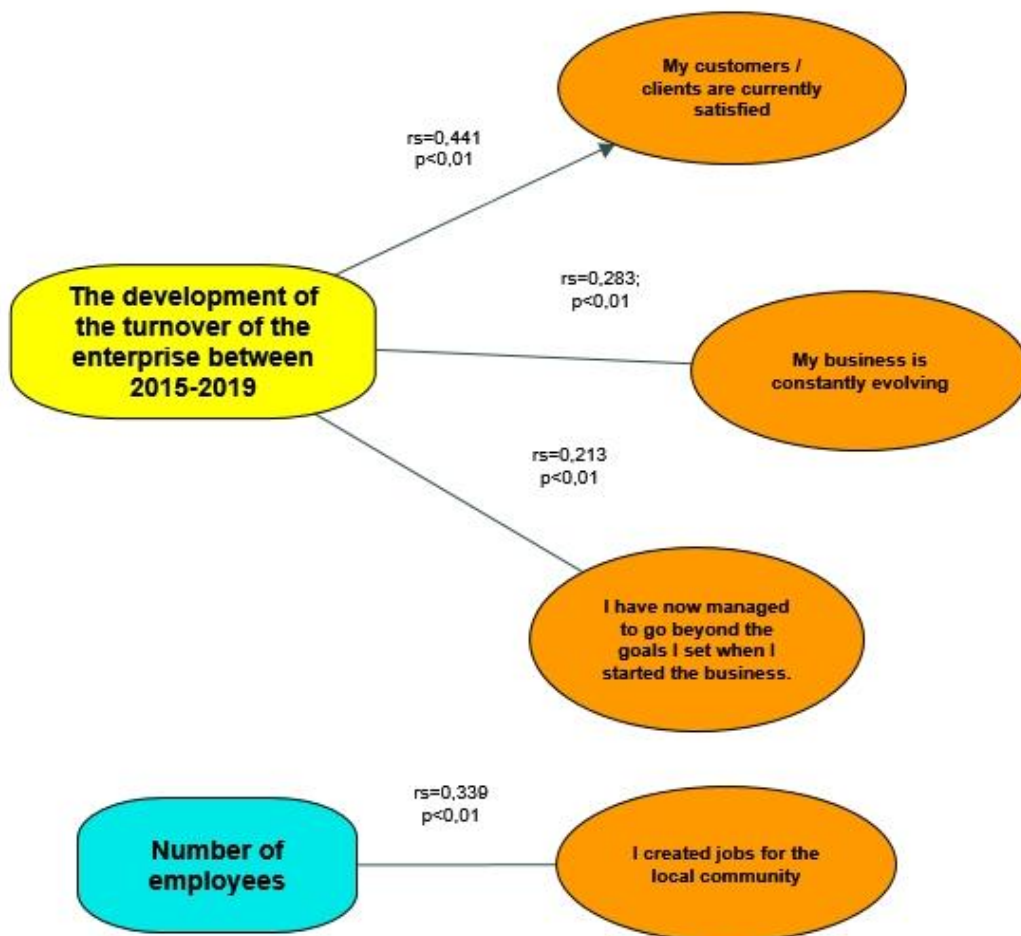


Figure 3. Relationship between subjective and objective success factors

Source: own processing based on own research

In the case of objective factors, no significant relationship was found with regard to the age of the enterprise, neither with subjective variables, nor with a variable called the age of the objective enterprise. We identified a positive medium relationship between the number of employees and the subjective variable for job creation, and it was the subjective economic factor that most correlated with other non-economic subjective success factors. The figure shows that there is a weak or medium positive relationship between our variables. We can also observe that the subjective economic factor correlates with subjective non-economic factors that are not specifically related to the entrepreneur, but to the enterprise itself.

In our questionnaire survey, the interviewees were asked an open question about what success means to them. The results were processed on the basis of Dej (2010) research. Dej (2010) examined the personal and organizational success in terms of different factors. First of all, let's look at the answers of the interviewees based on factors related to personal success.

- Self-realisation – Definitions related to self-realisation amounted for 24% of the answers. In some cases, respondents used the term self-realization specifically when it came to defining success. According to one of the respondents: 'Self-realisation leads to personal satisfaction'; "Success is, when I feel happy with my life". At the same time, the joy of work, satisfaction with work, satisfaction with private life and satisfaction with themselves also appeared.
- Independence – As a synonym for this success factor, we have often used the terms 'freedom' and 'opportunity'. One of the respondent expressed the feeling of freedom of choice as the following: "Being free to decide about my daily tasks". The respondent does not experience work as a compulsory activity, but experiences joy from her work on emotional level. "A man who never knows when Monday is, can be declared successful – that person feels happy to start the week". The respondent does not feel about her work as a necessary activity to survive, but as an activity she likes to spend time with and enjoys her work.
- Financial security/ income – definitions related to achieve financial security accounted for 14% of the responses, which is the 3rd highest percentage among factors. The term stability was often used by the respondents in relation to this factor, but the respondents also listed financial security and good financial situation to provide comfortable life or become self-sufficient. Finances were also mentioned in relation to the well-being of the family, as it is indicated in the following sentence: "I would like to ensure an a descent life for my family". Some of the respondents provided an answer „do not have to work”, which was interpreted as the respondent has already reached the desired financial stability and would like to devote less time and energy to work.
- Challenging and interesting tasks – This factor was not interpreted as fulfillment of challenging tasks, but achieving the goals previously set.
- Being your own boss /influence – I am the "master" of myself, as one respondent wrote. It is important to highlight the importance of time management and work-life balance. Work-life balance was important for most of the respondents as it is summarized by the respondent: "Interpretation of success is different for all of us. „My personal interpretation of success is achieving a healthy work-life balance.”
- Reputation/Prestige – in particular, we must mention achieving good reputation in the market, positive reputation of the company, recognition by competitors and the need for presence on the market.
- Social interactions with employees and customers – 22% of the responses concentrated on this issue. Satisfied customers, positive customer feedback and satisfied employees were also included in the list.
- Providing the requested service/product – Some of the respondents think that being able to provide a service useful for the society is a positive thing in terms of success.

When analysing the respondents' responses, we found that these factors do not exist in isolation, but merged into one - several factors in a single response. Another group of success factors is formed by factors related to the organization. We will list only those we were able deduct based on the respondent's opinion. We would like to highlight 3 factors:

- survival of the company – "It is a success for me that the company is 20 years old, operating in a business sector that is slowly disappearing." – the answer was provided by a baker, who is able to maintain his business even in difficult conditions, which requires hard work. Even continuity plays a role in this factor, i.e. continuous operation.
- Number of employees / increase the number of employees – "Success is that I can provide work and income to other people." As the sample is mainly represented by micro-enterprises, employing people considered to be a success factor for these type of businesses.
- business performance and growth – this factor was indicated by the respondents who think about success in terms of profit maximization, corporate growth, business development, high revenues and profitability.

When analyzing the answers, we were interested in the ratio between personal and organizational success factors. Personal factors are more emphasized by the respondents, only 6 percent of the responses were directly related to the success factors of the organization.

In our interviews, we asked the entrepreneurs what success means to them. Responses are coded based on personnel and organizational factors. In relation to personal success, the most frequent responses were „satisfied”, „positive feedback” and „satisfaction by achieving the desired goal”. In terms of organizational success, the respondents used the following expressions: “long-term operation”, “increasing sales” and “company development”. The results obtained as a result of interviews showed that the personal success factors are emphasized. 11 out of 16 interviewees said that they defined success based on their own personal factors. The remaining 5 respondents described success as a term based on both personal and organizational success factors.

Conclusion

The scientific literature and research related to entrepreneurial success defines success in terms of economic performance. Female entrepreneurial activity is not a widely discussed issue and is rarely addressed in the scientific literature focusing on business performance. At the same time, there are examples, where women tend to focus on non-economic factors when assessing their business activity. These non-economic factors include personal fulfilment, the pursuit of flexibility, customer satisfaction and personal satisfaction.

This research addressed to measure the success of female entrepreneurs on the basis of both economic and non-economic indicators. Our results confirmed the conclusions of previous research focusing on subjective, so-called non-economic goals.

When defining success in both quantitative and qualitative terms, it was confirmed that providing workplace independence in the case of female entrepreneurs provides them an opportunity to create a healthy work-life balance, perform family responsibilities more flexibly, thus making them feel satisfied with their family life. In addition to workplace freedom, achieving corporate goals will make these entrepreneurs satisfied, as well as the development of their business.

Among the subjective non-economic success factors, job creation was the only variable that was undervalued by the female entrepreneurs compared to other factors. We came to conclusion that this is a basic success factor for female entrepreneurs with employees. It does not necessarily mean that this socially important factor is negligible for female entrepreneurs, but shows that the number of female entrepreneurs who do not have or have maximum 1 employee is high in the sample. In terms of objective factors we detected a weak relationship between the age of the company existence and the number of employees, while there is a relationship between the number of employees and job creation. The entrepreneurs who feel more successful in terms of customer/customer satisfaction, have increased their turnover in 2015-2019. Based on the analysis we can summarize that the subjective factors measured by us do not directly contribute to the entrepreneur's satisfaction.

References

- Arasti, Z., Zandi, F., & Talebi, K. (2012). Exploring the Effect of Individual Factors on Business Failure in Iranian New Established Small Businesses. *International Business Research*, 5(4), 2-11. <https://doi.org/10.5539/ibr.v5n4p2>
- Austin, J., Stevenson, H., & Wei-Skillern, J. (2006). Social and Commercial Entrepreneurship: Same, Different, or Both? *Entrepreneurship Theory and Practice*, 30(1), 1–22. <https://doi.org/10.1111/j.1540-6520.2006.00107.x>
- Bačík, R., & Gburová, J. (2016). Internet and its influence on the consumer behavior of Slovak consumer. *Proceedings of the 28th International Business Information Management Association Conference - Vision 2020: Innovation Management, Development Sustainability, and Competitive Economic Growth*, 3342-3347
- Belas, J., Cepel, M., Kliuchnikava, Y., & Vrbka, J. (2020). Market risk in the SMEs segment in the Visegrad group countries. *Transformations in Business and Economics*, 19(3), 678-693
- Brush, C. G. et al. (2006). *Growth-oriented Women Entrepreneurs and their Businesses*. Edward Elgar Publishing Limited, 432 p.
- Casson M. (2003). Entrepreneurship, Business Culture and the Theory of the Firm. In: Acs Z.J., Audretsch D.B. (eds) *Handbook of Entrepreneurship Research. International Handbook Series on Entrepreneurship*, vol 1. Springer, Boston, MA. https://doi.org/10.1007/0-387-24519-7_10
- Crane G.F., & Crane E.C. (2007). Dispositional Optimism and Entrepreneurial Success. *The Psychologist-Manager Journal*, 10(1), 13-25. <https://doi.org/10.1080/10887150709336610>
- Dej, D. (2010). Defining and measuring entrepreneurial success. *Entrepreneurship: A Psychological Approach*. Prague: Oeconomica, 89-102.
- Dudić, Z., Dudić, B., Agbaba, B., & Nosková, M. (2020). The importance and application of the balanced scorecard model in enterprises. *Acta Oeconomica Universitatis Selye*, 9(1), 45-56
- Dvorsky, J., Belas, J., Gavurova, B., & Brabenec, T. (2021). Business risk management in the context of small and medium-sized enterprises. *Economic Research-Ekonomska Istrazivanja*, 34(1), 1690-1708
- Ettl K., & Welter F. (2012). Women Entrepreneurs and Success. In: Galindo M.A., Ribeiro D. (eds) *Women's Entrepreneurship and Economics. International Studies in Entrepreneurship*, vol 1000. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-1293-9_6
- Fisher, R., Maritz, A., & Lobo, A. (2014). Evaluating entrepreneurs' perception of success: Development of a measurement scale. *International Journal of Entrepreneurial Behavior & Research*, 20(5), 478-492. <https://doi.org/10.1108/IJEBR-10-2013-0157>
- Gorgievski, M. J., Ascalon, M. E., & Stephan, U. (2011). Small Business Owners' Success Criteria, a Values Approach to Personal Differences. *Journal of Small Business Management*, 49(2), 207-232. <https://doi.org/10.1111/j.1540-627X.2011.00322.x>
- Hajduová, Z., Peráček, T., Coroničová Hurajová, J., Brouthová, M. (2021). Determinants of innovativeness of Slovak SMEs. *Problems and Perspectives in Management*, 19(1), 198-208. [https://doi.org/10.21511/ppm.19\(1\).2021.17](https://doi.org/10.21511/ppm.19(1).2021.17)
- Ključnikov, A., Civelek, M., Fialova, V., & Folvarčnā, A. (2021). Organizational, local, and global innovativeness of family-owned SMEs depending on firm-individual level characteristics: evidence from the Czech Republic. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(1), 169–184. <https://doi.org/10.24136/eq.2021.006>
- Ključnikov, A., Civelek, M., Čech, P., & Kloudová, J. (2019). Entrepreneurial orientation of SMEs? Executives in the comparative perspective for Czechia and Turkey. *Oeconomia Copernicana*, 10(4), 773–795. <https://doi.org/10.24136/oc.2019.035>
- Konecna, V., & Andrejovska, A. (2020). Investor decision-making in the context of the effective corporate taxation. *E & M Ekonomie a Management*, 23(1), 111-120. <https://doi.org/10.15240/tul/001/2020-1-008>
- Korcsmáros, E. (2018). Factors affecting the development of SMEs (example from Slovakia based on primary research in Nitra region). *Acta Oeconomica Universitatis Selye* 7(1), 70-78
- Kostiukevych, R., Bilan, Y., Mishchuk, H., Sułkowska, J. & Kostiukevych, A. (2020). Possibilities of Integration of Strategic and Project Management in The Supporting System of Small and Medium-Sized Businesses at Local and Regional Levels. *Proceedings of the 35th International Business Information Management Association (IBIMA)*, 9253-9265.
- Machova, R., Zsigmond, T. (2019). Generational differences in terms of labour market and mobile applications. *International Scientific Conference on the Impact of Industry 4.0 on Job Creation*, 136-144
- Marišová E., Lichnerová, I., & Machyniak, J. (2021). Efficiency of the functioning of public administration: regional empirical study. *Administratie si Management Public*, 36, 165-180. <https://doi.org/10.24818/amp/2021.36-10>

- Mihokova, L., Andrejovska, A., & Martinkova, S. (2018). Tax Competitiveness of EU Member States in the Context of Corporate Taxation. *Politická Ekonomie*, 66(5), 588-608. <https://doi.org/10.18267/j.polek.1206>
- Milovic, N., Jocovic, M., & Djurisc, V. (2020). The Role of Entrepreneurship in the Development of Local Self-Governments in Montenegro. *Transformations in Business & Economics*, 19, 2(50), 159-170.
- Mishchuk, H., Bilan, S., Yurchyk, H. & Sułkowska, J. (2020). Social Protection of Employees as a Tool of Social Responsibility and Increase of Business Efficiency *Proceedings of the 35th International Business Information Management Association (IBIMA)*, 9459-9469.
- Nieman, G., Hough, J., & Nieuwenhuizen, C. (2003). *Entrepreneurship: A South African perspective*. Pretoria: Van Schaik.
- Oláh, J., Hidayat, Y. A., Dacko-Pikiewicz, Z., Hasan, M., & Popp, J. (2021). Inter-Organizational Trust on Financial Performance: Proposing Innovation as a Mediating Variable to Sustain in a Disruptive Era. *Sustainability*, 13(17), 9947, 1-19. <https://doi.org/10.3390/su13179947>
- Orser, B., & Dyke, L. (2009). The Influence of Gender and Occupational-Role on Entrepreneurs' and Corporate Managers' Success Criteria. *Journal of Small Business and Entrepreneurship*, 22(3), 327-353. <https://doi.org/10.1080/08276331.2009.10593459>
- Paudel, U.R., & Devkota, N. (2018). Socio-economic influences on small business performance in Nepal-India open border: Evidence from crosssectional analysis. *Economics and Sociology*, 11(4), 11-30. <https://doi.org/10.14254/2071-789X.2018/11-4/1>
- Pakurár, M., Khan, M.A., Benedek, A., & Oláh, J. (2020). The impact of green practices, cooperation and innovation on the performance of supply chains using statistical method of meta-analysis. *Journal of International Studies*, 13(3), 111-128. <https://doi.org/10.14254/2071-8330.2020/13-3/8>
- Peráček, T. (2019). Why is a simple company on shares an unnecessary type of business? *Proceedings of the 33rd International Business Information Management Association Conference, IBIMA 2019: Education Excellence and Innovation Management through Vision 2020*, 3282-3290
- Saidat, Z., Bani-Khalid, T., Al-Haddad, L., & Marashdeh, Z. (2020). Does family CEO enhance corporate performance? The case of Jordan. *Economics and Sociology*, 13(2), 43-52. <https://doi.org/10.14254/2071-789X.2020/13-2/3>
- Sajfert, D., Nikolić, M., Vukonjanski, J., Terek, E., & Vulović, M. (2019). The impact of ethical leadership behavior on communication satisfaction and organizational learning in companies in Serbia. *Acta Oeconomica Universitatis Selye*, 8(1), 138-159
- Saulius, T., Valanciene, D., & Bilan, S. (2020). Critical Thinking in Contemporary Business Education: Philosophical Perspectives. *Transformations in Business & Economics*, 19, 2 (50), 21-37
- Smerek, L., & Šurinčíková, M. (2020). Perception of leadership in Slovakia. *Acta Oeconomica Universitatis Selye*, 9 (2), 93-105. <https://doi.org/10.36007/Acta.2020.9.2.7>
- Wach, K., & Bilan, S. (2021). Public support and administration barriers towards entrepreneurial intentions of students in Poland. *Administratie si Management Public*, 36, 67-80. <https://doi.org/10.24818/amp/2021.36-04>
- Weber, P.Ch., & Geneste, L. (2014). Exploring gender-related perceptions of SME success. *International Journal of Gender and Entrepreneurship*, 6(1), 15-27. <https://doi.org/10.1108/IJGE-04-2013-0038>
- Zsigmond, T., Machová, R., & Zsigmondová, A. (2021). Strategic management from the perspective of SMEs operating in service sector. *Quality Innovation Prosperity*, 25(2), 37-53. <https://doi.org/10.12776/qip.v25i2.1549>

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RELATIONSHIPS BETWEEN ROAD TRANSPORT INFRASTRUCTURE AND TOURISM SPENDING: A DEVELOPMENT APPROACH IN EUROPEAN OECD COUNTRIES*

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Abstract. Road transport infrastructure is an attribute whose importance is increasingly emphasized in the context of a circular and sustainable economy. However, the link between this attribute and tourism spending has not been sufficiently examined. Therefore, with an emphasis on the level of development of European countries included in the Organisation for Economic Co-operation and Development (OECD), the research objective of this study was to assess the links between selected indicators of road transport and tourism spending. The analytical processing included economic data provided by international organizations and collected for the period 2010–201. Specifically, Human Development Index (HDI), Global Innovation Index (GII), Density of road (DENSITY), Share of urban roads (URBAN), Road infrastructure investment (INVEST), Business tourism spending (BTS), Leisure tourism spending (LTS), Domestic tourism spending (DTS), Foreign visitors spending (VEFS). The research sample consisted of European OECD countries (n = 26). Cluster analysis (Partition Around Medoids) divided selected countries based on HDI and GII into two clusters (less developed and more developed countries). The use of descriptive analysis together with analysis of differences (Mann – Whitney test) showed significant differences between these two clusters in most indicators (DENSITY, INVEST, BTS, LTS, DTS), while their higher values were measured in more developed countries with the exception of INVEST. Differences between clusters of countries were also revealed by correlation analysis (Spearman's ρ). In countries with a lower level of development, a panel regression analysis confirmed significant positive associations between DENSITY and tourism spending (BTS, LTS, VEFS). The results indicated that the development of countries played an important role in evaluating the links examined in this study. In less developed countries, progress in the development of road infrastructure could be associated with increased tourism spending.

Keywords: road, transport infrastructure, tourism, spending, sustainability, OECD countries, development, panel regression analysis

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JEL Classifications: L83, L90, O11, Z32

1. Introduction

Tourism can be considered a very important sector of the economy of many countries (Dogru & Bulut 2018, Uslu et al. 2020). Evidence of this statement is the significant contribution of tourism to gross domestic product (GDP) in countries (World Travel & Tourism Council [WTTC] 2020). This underlines the need to constantly examine this sector from different perspectives in order to identify significant factors with the potential for tourism development. One of these factors may be transport infrastructure, specifically road transport infrastructure (Vochozka & Sheng 2016, Lăzăroiu et al. 2020). There is no doubt that tourism and transport infrastructure are economically beneficial (Albaladejo et al. 2021, Chen et al. 2021, Haller et al. 2020, Nenavath 2021), and there is a presumption that they are interconnected. Li et al. (2015) emphasized that transport infrastructure always plays an important role in the development of tourism. According to the authors, the behaviour of tourism visitors when choosing a destination is characterized by a multinomial logit choice model based on the utility of destinations, which largely depends on the accessibility of destinations (Li et al. 2015, Liska 2016). This supports the willingness of policy makers to improve road transport infrastructure, as countries need to grow in terms of transport infrastructure and tourism in order to make economic gains (Horak et al. 2020). The above-mentioned facts were the greatest motivation for conducting the presented research, which focused on the links between selected indicators of road transport and tourism spending with an emphasis on the development approach in European OECD countries. For these reasons, this paper differs from other studies that analyse the marketing (Civelek et al. 2020) and innovative activities of various businesses in the tourism sector (Civelek et al. 2021, Ključnikov et al. 2021), and investigate the economic development of touristic locations (Ključnikov et al. 2020a, Ključnikov et al. 2020b) of some European countries. The structure of the study is as follows: the introduction section describes the main focus of the study. The theoretical background section provides key information on the issue in order to find out where the scientific knowledge is. The methodological section contains a description of the data as well as the methods used in the analytical process. The obtained results were the basis for discussion in the fourth section. The section of conclusions provides a brief summary of the most important findings from the study and a formulation of recommendations.

2. Theoretical background

As indicated above, transport infrastructure and tourism are two areas of economic life in countries that play an irreplaceable role in developing policies and plans aimed at sustainable development (Vochozka et al. 2016). These areas offer opportunities for socially responsible improvements that, in addition to generating economic benefits, also respect the environment and quality of life (Belas et al. 2018, 2020a, 2020b). Economic, social, environmental, innovative and cultural factors are vital for the development of sustainable tourism in countries and need to focus on stimulating and ensuring the positive effect of tourism infrastructure on concrete beneficial outcomes (Mamirkulova et al. 2020). Zhang J. and Zhang Y. (2021) investigated the dynamic link between tourism and transport infrastructure and confirmed the bidirectional Granger causality between highway and tourism. In addition, they revealed the fact that tourism and transport infrastructure have a synergy effect on income inequality. Costea et al. (2017) considered transport infrastructure to be a key determinant of competitiveness of tourism. According to these authors, the availability of a secure and fast transport network to the most important tourist centres of a country is vital. No tourist resource, no matter how important, can be effectively implemented without transport infrastructure. Thus, the absence or an insufficient development of

infrastructure can be a major factor of the lack of development of tourism activities (Costea et al. 2017). This is in line with the findings of Khadaroo and Seetanah (2008), who stated that transport infrastructure is a significant determinant of tourism inflows into a destination. In their other study, they revealed that tourists from Europe/America and Asia are particularly sensitive to transport infrastructure (Khadaroo & Seetanah 2007). Based on their results, transport infrastructure, non-transport infrastructure, but also income of tourists, distance, and relative prices are important elements in the equation of demand in tourism. At this point, the inflows and demand in tourism can be expressed by tourists' spending. All these findings support the importance of investigating the link between transport infrastructure and tourism at an international level and justify the presented research.

With the growing research interest in tourism and transport infrastructure, it is possible to identify different perspectives on the examination of these two areas. Nguyen (2021) examined the impact of investment in tourism infrastructure development on attracting international visitors. Using the potential accessibility approach, Michniak et al. (2014) investigated the impact of investments in road infrastructure on tourism development in terms of intensification of stays. Jou et al. (2012) focused on the influence of new road infrastructure on tourism behaviour. Wendt et al. (2021) examined the correlations between the development of the transport network and the increase in tourist traffic, and their results show that transport infrastructure plays a critical role in ensuring the connections of border regions. Kanwal et al. (2020) examined the relationship between perceived impact of road and transport infrastructure development and local community support for tourism through perceived environmental impact, perceived tourism benefits, and perceived community satisfaction. On the other hand, there is still a lack of knowledge on the link between road transport infrastructure and tourism demand represented by visitors' spending. Stehel and Vochozka (2016) examined economic added value in the transport sector. In connection with economic added value, Vochozka and Machová (2018) further examined the value generators of transport companies in the Czech Republic. Majerova and Fernandes (2020) examined brand loyalty as a future pillar of resuscitation of brand value in tourism and identified relevant sources of brand value relevant to brands characterized by loyalty.

The issue under investigation provides many indicators as appropriate measures of tourism development, but tourism spending is a crucial indicator that provides high economic value (Brida & Scuderi 2013, Garcia-Sanchez et al. 2013, Usmani et al. 2021). Compared to tourist arrivals, tourism spending captures not only the tourist attractiveness of a country, but also the behaviour of tourists in terms of their consumption of goods and services in a visited country as well as the economic effect (Fredman 2008, Wang & Davidson 2010). In this context, tourism spending is very closely linked to tourism participation, and the opposite is also true (Gavurova et al. 2020, Wu et al. 2013, Yang et al. 2021). At the same time, in the issue of tourism spending, it is necessary to take into account the purpose of traveling and spending money in a country. In this context, the main purposes include leisure activities and business activities of tourists (Uyen 2019). Leisure tourism covers purposes, in which recreation, relaxation, exploring new places and cultures, and hobbies play a dominant role (David-Negre et al. 2018, Venkatesh 2006). Business tourism covers work-related purposes, the core of which are meetings and events of a commercial, educational and governmental nature (Dragicevic et al. 2012, Nicula & Elena 2014). In addition to the above-mentioned, there are many other criteria for classifying tourism spending that should be taken into account in research in order to provide a deeper insight into the issue. For example, the place of residence may offer a closer look at both domestic and foreign tourists.

The facts presented in the previous paragraphs encourage the examination of the links between transport infrastructure and tourism demand, while this study took into account specific types of transport infrastructure, i.e., road transport infrastructure. In addition, tourism demand in this study was expressed by tourists' spending, which were classified in terms of purpose (business and leisure) and in terms of borders (domestic and foreign). This provided a deeper insight into the issue.

3. Research objective and methodology

With an emphasis on the level of development of European OECD countries, the research objective of this study was to assess the links between selected indicators of road transport and tourism spending using bivariate analysis of effects. This objective was met in three analytical steps:

- Dividing countries into clusters based on their innovation potential and development.
- Providing basic statistical information on data through descriptive analysis.
- Assessment of bivariate associations using correlation and regression analyses.

The analyses covered selected OECD countries with a geographical location in the European area. Thus, 26 countries were included in the research: Austria (AUS), Belgium (BEL), Czech Republic (CZE), Denmark (DEU), Estonia (EST), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Hungary (HUN), Iceland (ICL), Ireland (IRL), Italy (ITA), Latvia (LVA), Lithuania (LTU), Luxembourg (LUX), Netherlands (NDL), Norway (NOR), Poland (POL), Portugal (POR), Slovak Republic (SVK), Slovenia (SVN), Spain (ESP), Sweden (SWE), Switzerland (CHE), United Kingdom (GBR). The observed period in these countries was 2010 to 2018, while the innovation index for these countries was collected from the reports from 2011 to 2019, as they contained data with a one-year lag.

The whole analytical process included data obtained from the following databases:

- Human Development Reports (2021) for the Human Development Index (HDI): A composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living (measured in a score from 0 to 1; the higher the score, the more positive the evaluation).
- Cornell University, INSEAD and WIPO (2021) for the Global Innovation Index (GII): It ranks the innovation ecosystem performance of economies around the globe each year while highlighting innovation strengths and weaknesses and particular gaps in innovation metrics (measured in a score from 0 to 100; the higher the score, the more positive the evaluation).
- Organisation for Economic Co-operation and Development database (OECD 2021): (i) Density of road km per one hundred square km (DENSITY); (ii) Share of urban roads in total road network (URBAN); (iii) Road infrastructure investment per gross domestic product (INVEST).
- World Travel & Tourism Council database (WTTC 2020): (i) Business tourism spending (BTS) – spending of domestic residents and foreign visitors during business trips in a country (USD per capita); (ii) Leisure tourism spending (LTS) – spending of domestic residents and foreign visitors on leisure purposes in a country (USD per capita); (iii) Domestic tourism spending (DTS) – spending of domestic residents on business and leisure purposes in a country (USD per capita); (iv) Foreign visitors spending (VEFS) – spending of foreign visitors on business and leisure purposes in a country, including transport spending, but excluding international spending on education (USD per capita).

The data on tourism spending were mathematically adjusted, as the WTTC database provided gross values per country in billions of dollars:

$$TS_i = \frac{\frac{TS_i \times 1,000,000,000}{POPULATION_i}}{\frac{PPP_i}{100}}$$

The whole analytical process was divided into two integral parts. The first part was devoted to cluster analysis, the purpose of which was to divide countries into homogenous clusters based on their HDI and GII. Prior to this analysis, the silhouette method was used to estimate the optimal number of clusters. The cluster analysis was based on Partitioning Around Medoids (PAM) method and Manhattan distance (Kassambara 2017). At this point,

it should be noted that the clusters of countries identified by the cluster analysis were applied in further analyses of this research. Thus, the interpretations of their results were formulated in terms of a cluster of less developed countries and a cluster of more developed countries. In the first part of the whole analytical process, a descriptive analysis was also used to point out the statistical characteristics of the data in terms of central tendency measures (mean, median). This analysis also included an assessment of the differences in selected indicators between individual clusters. The nonparametric Mann–Whitney U test was used for this purpose. The second part of the whole analytical process consisted of correlation analysis and regression analysis. The correlation analysis was performed using a nonparametric method, i.e., Spearman's ρ . The regression analysis was performed in two steps: (i) first, the assumptions were verified to select a suitable model (fixed effects / random effects), (ii) second, panel regression analysis was applied. F tests (FT ID, FT Time) verified the significance of effects in the internal data structure with respect to its country dimension (ID) and its time dimension (Time). This step justified the application of panel models. The Hausman test (HT) was used to decide on the choice of a regression model with fixed effects or a regression model with random effects (Wooldridge 2010). The above-mentioned analytical procedures were performed using the R programming language – version: 4.1.1, nickname: Kick Things (R Core Team 2021) and IDE PyCharm (JetBrains s.r.o., Prague, Czech Republic).

4. Results and discussion

This section presents the main results of the analyses described in the methodology. At the beginning of this section, the cluster analysis was carried out, and the essence of this analysis was the division of countries into homogenous clusters in terms of their level of development represented by HDI and GII indicators. For this purpose, the data (GII and HDI) collected for each country were first averaged over the observed period. Subsequently, the averaged values were standardized in the range of 0 to 1, with 0 representing the lowest average score and 1 the highest average score.

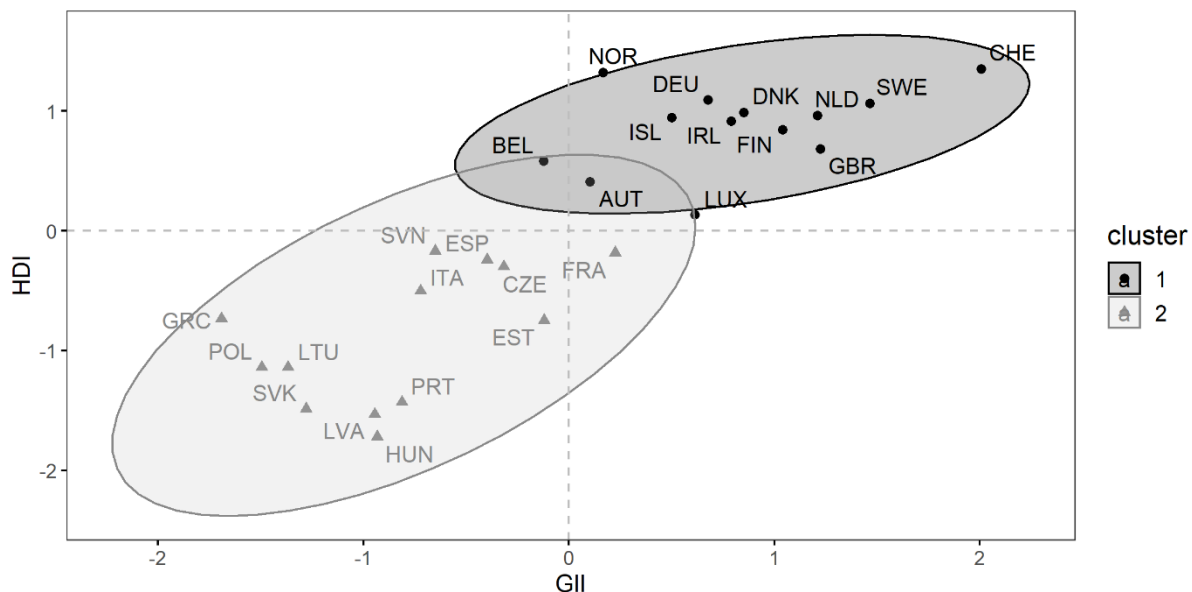


Figure 1. Cluster map – GII & HDI

Source: own elaboration

In terms of cluster analysis, the first step was focused on determining the optimal number of clusters using the silhouette method. Two clusters of countries were estimated for the cluster analysis using the PAM method based on the Manhattan distance. Figure 1 shows a cluster map, in which the first cluster included countries with a higher level of development represented by HDI and GII and the second cluster covered countries with a lower level of development. Accordingly, the most developed countries were Switzerland, Sweden and the Netherlands. On the other hand, less developed countries could be considered as countries with great potential to improve their development. The convergence theory indicates faster progress in weaker countries compared to stronger countries, and in this way weaker countries can more easily get closer to stronger countries. A well-designed policy can avoid the risk of middle income and many other economic imperfections that have affected several countries with higher levels of development. A similar idea was also presented in a study conducted by Ekonomou and Kallioras (2020).

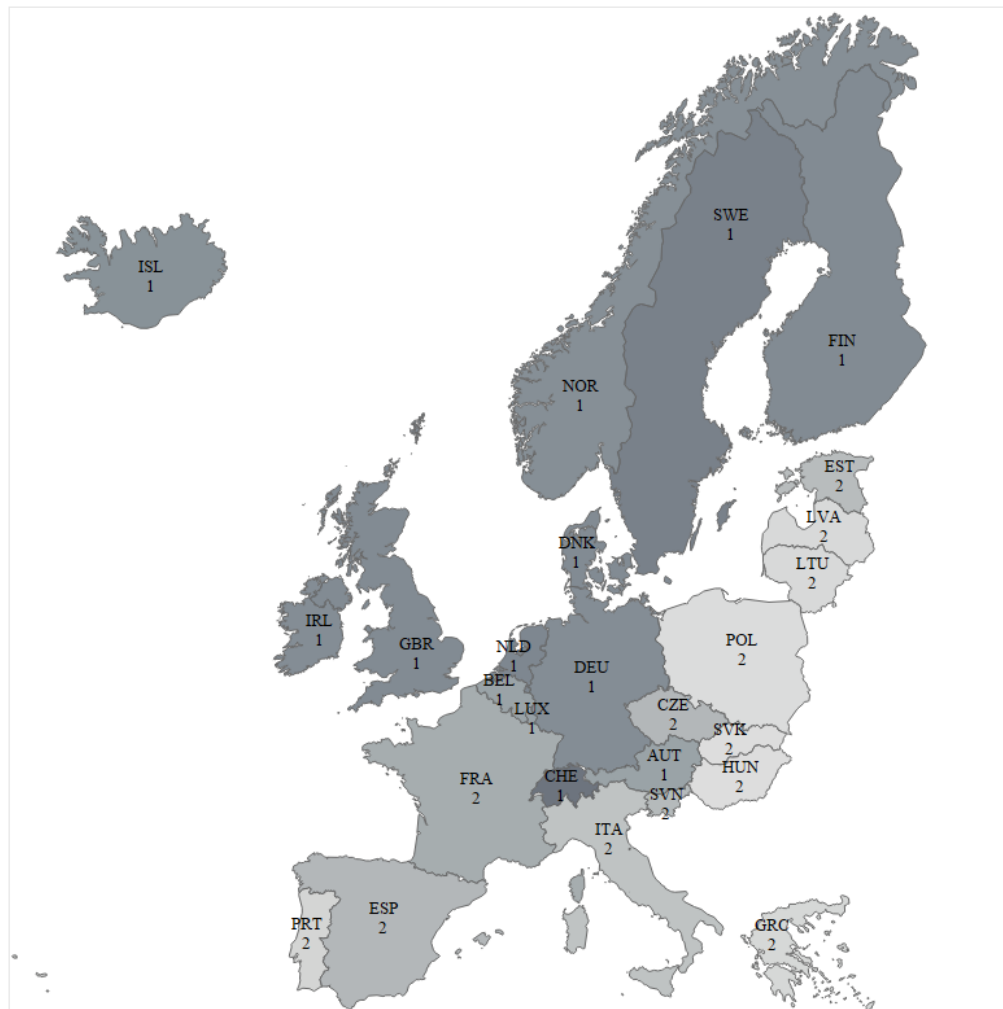


Figure 2. Clusters in a geographical context

Source: own elaboration

Figure 2 shows the examined countries in a geographical context, and the intensity of their shadow indicates their development. In other words, the more intense shadow presents a higher value of the standardized average GII and HDI indicators (the more intense the shadow, the higher the level of development). The number assigned to the countries indicates the cluster in which they were included.

Table 1. Descriptive analysis of road transport indicators and tourism spending indicators

ID	C l	DENSITY		URBAN		INVEST		BTS		LTS		DTS		VEFS	
		Mean	Med	Mean	Med	Mean	Med	Mean	Med	Mean	Med	Mean	Med	Mean	Med
AUT	1	155.16	150.97	71.82	71.24	0.12	0.12	576.9	574.6	3480.2	3474.2	2090.6	2093.8	1966.5	1951.3
BEL	1	510.49	510.49	-	-	0.14	0.15	427.9	423.9	1213.9	1209.6	742.7	728.2	899.1	968.5
CHE	1	180.96	180.99	-	-	0.70	0.69	511.4	511.5	2876.9	2870.3	1933.1	1935.8	1455.1	1445.5
CZE	2	72.18	72.18	30.03	30.00	0.58	0.51	277.7	258.2	1176.4	1180.7	593.3	578.4	860.8	855.6
DEU	1	-	-	-	-	0.44	0.43	615.6	607.3	2941.2	2930.2	3065.5	3031.2	491.3	496.1
DNK	1	176.66	177.20	-	-	0.41	0.40	927.4	940.7	1483.2	1444.7	1354.4	1331.3	1056.2	1054.0
ESP	2	-	-	-	-	0.45	0.42	368.2	366.8	2748.6	2779.7	1393.8	1377.7	1723.0	1768.8
EST	2	136.64	136.02	8.55	8.66	0.90	0.89	658.5	681.1	2130.5	2166.6	714.9	699.5	2074.2	2145.9
FIN	1	25.68	25.69	10.80	11.25	0.56	0.56	788.6	781.4	2047.9	2072.7	2089.1	2102.8	747.4	782.3
FRA	2	196.69	198.01	14.76	14.82	0.53	0.50	490.6	484.6	2034.3	2020.4	1694.3	1687.9	830.5	806.1
GBR	1	174.22	174.21	35.57	35.27	0.33	0.34	902.0	872.7	1901.4	1918.1	2309.9	2367.2	493.6	504.7
GRC	2	-	-	-	-	0.99	0.86	227.1	221.5	3222.6	3347.8	1392.4	1395.1	2057.2	2176.7
HUN	2	226.46	225.20	31.39	31.48	0.77	0.84	136.4	135.9	1188.9	1151.5	391.0	395.1	934.3	900.6
IRL	1	141.23	139.36	-	-	0.38	0.33	618.4	653.0	1354.8	1330.9	450.9	474.3	1522.3	1514.8
ISL	1	-	-	-	-	0.43	0.40	1768.2	1601.6	6867.3	6901.5	2913.0	2943.4	5722.5	5485.0
ITA	2	86.40	86.76	-	-	0.24	0.22	601.2	579.6	2440.4	2538.5	2317.2	2400.4	724.3	735.4
LTU	2	134.29	134.62	78.79	82.06	0.87	0.73	248.9	255.3	898.2	904.8	484.6	503.5	662.5	671.7
LUX	1	124.67	119.30	25.75	25.75	0.43	0.44	183.2	170.2	3749.4	3850.0	696.6	694.8	3236.0	3324.7
LVA	2	94.16	94.18	15.29	15.36	0.83	0.83	278.4	282.8	1357.8	1376.2	682.3	687.3	953.9	911.8
NLD	1	412.50	412.32	52.08	52.08	0.36	0.36	426.1	406.6	1243.2	1240.0	876.5	869.5	792.8	777.2
NOR	1	25.90	25.89	-	-	0.96	1.01	576.4	555.2	1769.1	1635.8	1655.0	1538.5	690.5	652.5
POL	2	135.99	136.20	16.38	16.36	0.96	0.69	171.5	150.1	482.6	481.9	211.0	209.5	443.1	438.5
PRT	2	15.36	15.62	-	-	0.38	0.16	522.2	548.1	2806.6	2811.7	1198.3	1253.2	2130.6	2085.2
SVK	2	108.03	114.01	-	-	0.76	0.72	359.2	341.8	866.6	814.6	626.0	608.4	599.9	553.3
SVN	2	100.25	100.17	31.54	31.20	0.34	0.29	387.6	374.3	2240.8	2240.2	909.3	906.5	1719.1	1712.9
SWE	1	52.86	52.81	19.97	19.63	0.46	0.46	892.5	869.0	1867.7	1854.8	1732.0	1732.8	1028.2	991.1
CL	1	169.70	150.97	35.17	35.20	0.45	0.42	708.8	595.0	2522.8	1973.2	1685.3	1804.1	1546.3	1004.3
CL	2	119.10	116.19	29.68	29.95	0.68	0.61	363.7	332.8	1814.9	1976.0	969.9	749.7	1208.7	907.3
Diff Test		8442***		2888		9716†		9231†		11893†		10147†		13501	

Note: ID – country identifier; Cl – cluster; Med – median; Diff Test – difference test; DENSITY – density of road km per one hundred square km; URBAN – share of urban roads in total road network; INVEST – road infrastructure investment per gross domestic product; BTS – business tourism spending; LTS – leisure tourism spending; DTS – domestic tourism spending; VEFS – foreign visitors spending; p-value < 0.01 – ***; p-value < 0.001 – †

Source: own elaboration

Table 1 shows the measures of the central tendency (mean, median) for individual countries. The table also contains a column, in which the cluster (CI) is defined for each country. Missing values were identified for the DENSITY and URBAN indicators in several countries. At this point, it should be noted that these countries were not included in the bivariate analytical procedures, i.e., they were excluded from the sample. At the end of the table, the rows CL 1 and CL 2 show the results for the individual identified clusters (groups) of countries. The last row contains the results of the difference test, which evaluated the differences in individual indicators between cluster 1 and cluster 2.

Significant differences were found in most indicators. In terms of road transport indicators, significant differences were identified for DENSITY and INVEST. For DENSITY, a higher value of central tendency measures was observed in cluster 1 (mean = 169.70; median = 150.97). This indicates that the countries included in cluster 1 (more developed countries) were characterized by a higher density of roads. On the contrary, for INVEST, higher values of central tendency measures were observed in cluster 2 (mean = 0.68; median = 0.61). Accordingly, the countries included in cluster 2 (less developed countries) were characterized by higher investments in road infrastructure per gross domestic product.

The revealed findings can be understood as meaning that more developed countries already have a quality road infrastructure, while less developed countries are only in the process of building it. In line with this assumption, a higher level of road infrastructure in more developed countries encourages higher road density, while efforts to build better road infrastructure require more investment in less developed countries.

These efforts are mainly aimed at reducing inequalities in transport infrastructure between different countries, which can also help to address the problems of uneven economic growth across countries in the long term (Chen et al. 2021). In fact, investments in transport are a key aspect of economic growth. Countries thus have the opportunity to improve their position in the development assessment presented in this study. In addition, investments in transport and communications infrastructure have a strong and positive impact on international visitor attraction (Nguyen 2021), which may be reflected in tourism demand and, consequently, in tourism spending.

In terms of tourism spending indicators, significant differences were identified for BTS, LTS and DTS, and higher values of central tendency measures were observed in cluster 1. This suggests that the countries included in cluster 1 reported significantly higher business tourism spending, leisure tourism spending, and domestic tourism spending. These results were expected, as more developed countries also have more developed tourism. The results in this study can be compared with the results of Szajt (2018), who took a closer look at changes in tourism spending in the countries of the European Union and economic development.

Table 2. Correlation matrix in cluster specification – Spearman's ρ

Indicator	DENSITY	URBAN	INVEST	BTS	LTS	DTS	VEFS
cluster 1							
DENSITY		0.767	-0.431	-0.280	-0.363	-0.185	0.057
URBAN	<0.001		-0.924	-0.304	0.335	0.191	0.339
INVEST	<0.001	<0.001		0.008	0.091	0.068	-0.163
BTS	0.006	0.067	0.931		0.198	0.579	-0.045
LTS	<0.001	0.043	0.345	0.033		0.596	0.475
DTS	0.071	0.257	0.482	<0.001	<0.001		-0.230
VEFS	0.579	0.040	0.091	0.629	<0.001	0.013	
cluster 2							
DENSITY		-0.117	0.299	-0.276	-0.317	-0.361	-0.167
URBAN	0.365		-0.170	-0.534	-0.402	-0.382	-0.352
INVEST	0.004	0.186		-0.344	-0.294	-0.411	0.036
BTS	0.006	<0.001	<0.001		0.516	0.661	0.376
LTS	0.001	0.001	0.002	<0.001		0.822	0.809
DTS	<0.001	0.002	<0.001	<0.001	<0.001		0.437
VEFS	0.099	0.005	0.708	<0.001	<0.001	<0.001	

Source: own elaboration

Table 2 shows the results of a nonparametric correlation analysis in which the cluster specification was applied. The upper part above the diagonal of the individual matrices contains correlation coefficients and the lower part below the diagonal contains p-values expressing the statistical significance of coefficients. Negative coefficients are highlighted in red and positive coefficients are highlighted in green. Coefficients with a significance level of 0.05 and lower are highlighted in bold. A richer colour indicates a stronger correlation. Significant differences in correlations between more developed countries (cluster 1) and less developed countries (cluster 2) could be observed in a substantial number of analysed cases. Focusing on the correlations with DENSITY, different results were found for URBAN (ρ : cluster 1 = 0.767; cluster 2 = -0.117) and INVEST (ρ : cluster 1 = -0.431; cluster 2 = 0.299). Regarding the correlations with URBAN, different results between clusters were evident for all indicators. In terms of the correlations with INVEST, it was possible to observe different results between clusters in all indicators with one exception, which was VEFS. Interestingly, different results were also identified in terms of tourism spending indicators and their correlations. A significant and positive correlation between BTS and VEFS was revealed in cluster 2 (ρ = 0.376, p-value = <0.001), but this was not true in cluster 1, where the significance of this correlation was not confirmed (ρ = -0.045, p-value = 0.629). The most obvious difference was found in the correlation between DTS and VEFS (ρ : cluster 1 = -0.230; cluster 2 = 0.437). Thus, differences between clusters of countries were also revealed by correlation analysis. All these confrontational findings require further research.

Table 3. PLM – selection of the most suitable model

Reg. Model	PLM model Cluster 1	PLM model Cluster 2
DENSITY→BTS	RND	WTN
DENSITY→LTS	RND	WTN
DENSITY→DTS	RND	RND
DENSITY→VEFS	RND	WTN
URBAN→BTS	RND	RND
URBAN→LTS	RND	RND
URBAN→DTS	RND	RND
URBAN→VEFS	RND	RND
INVEST→BTS	RND	WTN
INVEST→LTS	RND	WTN
INVEST→DTS	RND	RND
INVEST→VEFS	RND	RND

Note: RND – White 2 Random ind ID; WTN – Arellano Within ind ID

Source: own elaboration

Table 3 specifies the most suitable methods for estimates in the applied regression analyses. These concretisations of the methods were selected on the basis of several tests (F test for individual and time effects, Hausman test), the results of which are given in Appendix 1.

Table 4. Results of PLM regression models

Model	Coef	PLS model Cluster 1	PLS model Cluster 2
DENSITY→BTS	β a	-0.580 726.360	2.06***
DENSITY→LTS	β a	-0.80 2,236.640	10.90**
DENSITY→DTS	β a	-1.350 1,688.970	1.190 747.280
DENSITY→VEFS	β a	0.080 1,255.060	10.13**
URBAN→BTS	β a	-2.510 705.020	-0.380 337.970
URBAN→LTS	β a	6.480 2,164.720	-1.250 1,484.470
URBAN→DTS	β a	1.990 1,571.070	4.60 583.790
URBAN→VEFS	β a	2.740 1,269.680	-3.580 1,163.770
INVEST→BTS	β a	-67.380 735.470	-16.18
INVEST→LTS	β a	-298.990 2,655.630	152.8
INVEST→DTS	β a	177.850 1,604.580	-5.460 965.810
INVEST→VEFS	β a	-576.770 1,799.340	134.180 1,088.380

Note: p-value < 0.05 – **; p-value < 0.01 – ***

Source: own elaboration

Table 4 shows the results of regression models, based on which it was possible to confirm a positive and significant association in only three analysed cases, namely between DENSITY and BTS ($\beta = 2.06^{***}$), between DENSITY and LTS ($\beta = 10.9^{**}$), and between DENSITY and VEFS ($\beta = 10.13^{**}$). These associations were found in cluster 2, i.e., in less developed countries. The findings revealed the fact that in less developed countries, a higher density of roads can be reflected in higher business tourism spending, leisure tourism spending, and foreign visitors spending. The findings of this study may follow the findings of Zhang J. and Zhang Y. (2021), who revealed a significant association between transport infrastructure (represented by highways) and tourism. More specifically, Zhang et al. (2021) also revealed the effect of road network density on tourism. This study did not confirm any significant association between road infrastructure investment and foreign visitors' spending, while the findings of Nguyen (2021) indicated a strong and positive impact of transport investments on foreign visitor attraction. On this basis, it was assumed that a higher foreign visitor attraction would be reflected in their willingness to pay, as well as in tourism spending as such. However, this was not supported in the presented study. This can be explained by the fact that the study covered only investments in road infrastructure, while the inclusion of investments in all types of transport infrastructure could show different results. The nature of participation in tourism in terms of length of stay should also be considered, Michniak et al. (2014) revealed that investments in road infrastructure may lead to an intensification of weekend-tourism or several days' tourism, indicating expected higher tourism spending. On the other hand, the authors pointed out a minor effect of the investments in terms of the choice of long-term stays. Further research is needed in this regard. Also, the fact remains that tourism is a very complex research area, and many other factors should be taken into account (Feriyanto et al. 2019, Kozicka et al. 2019).

5. Conclusions

The research objective of this study was to assess the links between selected indicators of road transport and tourism spending using bivariate analysis of effects. The study applied a development approach in European OECD countries. The applied cluster analysis divided the examined countries into two homogenous clusters based on the Human Development Index and the Global Innovation Index. Accordingly, more developed countries (cluster 1) and less developed countries (cluster 2) were included into the main analyses. Descriptive analysis provided a first look at the data. It was the difference analysis that revealed significant differences in road transport indicators and tourism spending indicators between cluster 1 and cluster 2. In general, more developed countries were characterized by a significantly higher density of roads. On the other hand, less developed countries were characterized by significantly higher investments in road infrastructure per gross domestic product. In terms of tourism spending indicators, more developed countries reported significantly higher business tourism spending, leisure tourism spending, and domestic tourism spending. The results of the correlation analysis also revealed considerable differences in the significance and direction of correlations between countries with a higher level of development and countries with a lower level of development. It could be stated very cautiously that, in terms of the correlations between road transport indicators and tourism visitors' spending, positive coefficients prevailed in countries with a higher level of development, and negative coefficients prevailed in countries with a lower level of development. Using panel regression models, it was possible to confirm significant associations between road transport indicators and tourism spending in only three analysed cases. In all three cases, these findings were observed in countries with a lower level of development and in the road density indicator. On the basis of a positive trajectory, it could be concluded that an increase in road density can be associated with an increase in tourism spending (business, leisure and foreign) in less developed countries.

Focusing on policy implications and recommendations, this study offers a valuable platform of important findings needed for evidence-based decision-making at national and international levels. The results could be of interest to strategic planners and policy makers, who should know the situation from every perspective in order to strengthen tourism and infrastructure and thus the economy. Deeper knowledge can ensure effective decisions.

The study provides new knowledge in the issue of tourism and transport infrastructure, while a specific research optic has been applied. It has been shown that in less developed countries, progress in the development of road infrastructure could be associated with increased tourism spending, and this should be taken into account by decision-makers in these countries. The results indicated that the development of countries played an important role in evaluating the links examined in this study. In countries with a lower or higher level of development, various ways should be sought to improve economic prosperity as well as sustainability. The links between the indicators of road transport and tourism spending have not been sufficiently examined; therefore, it can be stated that the study filled this research gap and brought novelty and a new perspective on the issue.

Potential limitations can also be identified in this study. For instance, the findings can be generalized only to OECD countries. Future research activities will focus on other indicators of transport infrastructure, as well as other indicators expressing the development of tourism, which would be closer to each other in practical life.

References

- Albaladejo, I. P., González-Martínez, M. I., & Martínez-García, M. P. (2014). Quality and endogenous tourism: An empirical approach. *Tourism Management*, 41, 141–147. <http://dx.doi.org/10.1016/j.tourman.2013.09.006>
- Belas, J., Amoah, J., Petráková, Z., Kliuchnikava, Y., & Bilan, Y. (2020a). Selected factors of SMEs management in the service sector. *Journal of Tourism and Services*, 21(11), 129–146. <http://dx.doi.org/10.29036/jots.v11i21.215>
- Belas, J., Gavurova, B., Cepel, M., & Kubak, M. (2020b). Evaluation of economic potential of business environment development by comparing sector differences: Perspective of SMEs in the Czech Republic and Slovakia. *Oeconomia Copernicana*, 11(1), 135–159. <http://dx.doi.org/10.24136/oc.2020.006>
- Belas, J., Gavurova, B., & Toth, P. (2018). Impact of selected characteristics of SMEs on the capital structure. *Journal of Business Economics and Management*, 19(4), 592–608. <http://dx.doi.org/10.3846/jbem.2018.6583>
- Brida, J. G., & Scuderi, R. (2013). Determinants of tourist expenditure: A review of microeconomic models. *Tourism Management Perspectives*, 6, 28–40. <http://dx.doi.org/10.1016/j.tmp.2012.10.006>
- Chen, A., Li, Y., Ye, K., Nie, T., & Liu, R. (2021). Does transport infrastructure inequality matter for economic growth? Evidence from China. *Land*, 10(8), 874. <http://dx.doi.org/10.3390/land10080874>
- Civelek, M., Gajdka, K., Světlík, J., & Vavrečka, V. (2020). Differences in the usage of online marketing and social media tools: Evidence from Czech, Slovakian and Hungarian SMEs. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 15(3), 537–563. <http://dx.doi.org/10.24136/eq.2020.024>
- Civelek, M., Ključnikov, A., Fialova, V., Folvarčná, A., & Stoch, M. (2021). How innovativeness of family-owned SMEs differ depending on their characteristics? *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(2), 413–428. <http://dx.doi.org/10.24136/eq.2021.015>
- Cornell University, INSEAD and WIPO. (2021). *About the Global Innovation Index*. Retrieved November 4, 2021 from <https://www.globa-linnovationindex.org/about-gii#reports>
- Costea, M., Hapenciuc, C. V., & Arionesei, G. (2017). The general transport infrastructure - a key determinant of competitiveness of tourism in Romania and CEE-EU countries. In P. Hajek, O. Vit, P. Basova, M. Krijt, H. Paszekova, O. Souckova, & R. Mudrik (Eds.), *CBU International Conference Proceedings 2017: Innovations in Science and Education*, Vol. 5 (pp. 79–85). <http://dx.doi.org/10.12955/cbup.v5.906>
- David-Negre, T., Hernandez, J. M., & Moreno-Gil, S. (2018). Understanding tourists' leisure expenditure at the destination: A social network analysis. *Journal of Travel & Tourism Marketing*, 35(7), 922–937. <http://dx.doi.org/10.1080/10548408.2018.1447533>
- Dogru, T., & Bulut, U. (2018). Is tourism an engine for economic recovery? Theory and empirical evidence. *Tourism Management*, 67, 425–434. <http://dx.doi.org/10.1016/j.tourman.2017.06.014>

- Dragicevic, V., Jovicic, D., Blesic, I., Stankov, U., & Boskovic, D. (2012). Business tourism destination competitiveness: A case of Vojvodina province (Serbia). *Economic Research-Ekonomska Istraživanja*, 25(2), 311–331. <http://dx.doi.org/10.1080/1331677X.2012.11517510>
- Ekonomou, G. & Kallioras, D. (2020). Business tourism spending in Eurozone countries: Detecting for convergence trends. *European Journal of Tourism Research*, 26, 2610. Retrieved November 4, 2021 from <https://ejtr.vumk.eu/index.php/about/article/view/1941>
- Feriyanto, N., Kot, S., Sugandini, D., & Muafi. (2019). The development of community based tourism: From attractiveness to loyalty. *Quality-Access to Success*, 20(S1), 393–398.
- Fredman, P. (2008). Determinants of visitor expenditures in mountain tourism. *Tourism Economics*, 14(2), 297–311. <http://dx.doi.org/10.5367/000000008784460418>
- Garcia-Sanchez, A., Fernandez-Rubio, E., & Collado, M. D. (2013). Daily expenses of foreign tourists, length of stay and activities: Evidence from Spain. *Tourism Economics*, 19(3), 613–630. <http://dx.doi.org/10.5367/te.2013.0218>
- Gavurova, B., Ivankova, V., Rigelsky, M., & Přívarová, M. (2020). Relations between tourism spending and global competitiveness – an empirical study in developed OECD Countries. *Journal of Tourism and Services*, 21(11), 38–54. <http://dx.doi.org/10.29036/jots.v11i21.175>
- Haller, A. P., Butnaru, G. I., Harsan, G. D. T., & Stefanica, M. (2020). The relationship between tourism and economic growth in the EU-28. Is there a tendency towards convergence? *Economic Research-Ekonomska Istraživanja*, 34(1), 1121–1145. <http://dx.doi.org/10.1080/1331677X.2020.1819852>
- Human Development Reports. (2021). *United Nations Development Programme*. Retrieved November 4, 2021 from <http://hdr.undp.org/en>
- Horak J., Suler P., & Vrbka J. (2020). Analysis of transportation companies in the Czech Republic by the Kohonen networks - identification of industry leaders. *Communications - Scientific Letters of the University of Zilina*, 23(1), 32–43. <http://dx.doi.org/10.26552/COM.C.2021.1.A32-A43>
- Jou, R. C., Hensher, D., & Su, W. C. (2012). The influence of new road infrastructure on tourism behaviour in Taiwan: The Sun Moon Lake experience. *Road & Transport Research*, 21 (4), 50–61. Retrieved November 4, 2021 from <https://search.informit.org/doi/10.3316/informit.145544694512676>
- Kanwal, S., Rasheed, M.I., Pitafi, A.H., Pitafi, A., & Ren, M. (2020). Road and transport infrastructure development and community support for tourism: The role of perceived benefits, and community satisfaction. *Tourism Management*, 77, 104014. <http://dx.doi.org/10.1016/j.tourman.2019.104014>
- Kassambara, A. (2017). *Practical guide to cluster analysis in R: Unsupervised machine learning (Volume 1)*. Paris: STHDA.
- Khadaroo, J., & Seetanah, B. (2007). Transport infrastructure and tourism development. *Annals of Tourism Research*, 34(4), 1021–1032. <http://dx.doi.org/10.1016/j.annals.2007.05.010>
- Khadaroo, J., & Seetanah, B. (2008). The role of transport infrastructure in international tourism development: A gravity model approach. *Tourism Management*, 29(5), 831–840. <http://dx.doi.org/10.1016/j.tourman.2007.09.005>
- Ključnikov, A., Civelek, M., Fialova, V., & Folvarčn, A. (2021). Organizational, local, and global innovativeness of family-owned SMEs depending on firm-individual level characteristics: evidence from the Czech Republic. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(1), 169–184. <http://dx.doi.org/10.24136/eq.2021.006>
- Ključnikov, A., Civelek, M., Polch, J., Mikolš, Z., & Banot, M. (2020a). How do security and benefits instill trustworthiness of a digital local currency? *Oeconomia Copernicana*, 11(3), 433–465. <http://dx.doi.org/10.24136/oc.2020.018>
- Ključnikov, A., Civelek, M., Voznkov, I., & Krajčk, V. (2020b). Can discounts expand local and digital currency awareness of individuals depending on their characteristics? *Oeconomia Copernicana*, 11(2), 239–266. <http://dx.doi.org/10.24136/oc.2020.010>
- Kozicka, K., Kot, S., & Riana, I. G. (2019). The efficiency of cooperation between the participants in the supply chain in the tourism-related branch of industry in relation to client satisfaction. *Sustainability*, 11(17), 4716. <http://dx.doi.org/10.3390/su11174716>

- Lăzăroiu G., Machova V., & Kucera J. (2020). Connected and autonomous vehicle mobility: Socially disruptive technologies, networked transport systems, and big data algorithmic analytics. *Contemporary Readings in Law and Social Justice*, 12(2), 61–69. <http://dx.doi.org/10.22381/CRLSJ12220207>
- Li, J., Zhang, W., Xu, H., & Jiang, J. (2015). Dynamic competition and cooperation of road infrastructure investment of multiple tourism destinations: A case study of Xidi and Hongcun World Cultural Heritage. *Discrete Dynamics in Nature and Society*, 2015, 962028. <http://dx.doi.org/10.1155/2015/962028>
- Liska, M. (2016). Travelling by train between Czechoslovakia and Germany after the Munich agreement. *Littera Scripta*, 9(3), 24–31.
- Majerova, J., & Fernandes, C. (2020). How to make phoenix to arise from the ashes: Brand loyalty as a prospective pillar of branding in tourism after crisis COVID-19. *Littera Scripta*, 13(2), 49–58. http://dx.doi.org/10.36708/Littera_Scripta2020/2/5
- Mamirkulova, G., Mi, J., Abbas, J., Mahmood, S., Mubeen, R., & Ziapour, A. (2020). New Silk Road infrastructure opportunities in developing tourism environment for residents better quality of life. *Global Ecology and Conservation*, 24, e01194. <http://dx.doi.org/10.1016/j.gecco.2020.e01194>
- Michniak, D., Wieckowski, M., Komornicki, T., Rosik, P., Stepniak, M., & Sleszynski, P. (2014). Analysis of the impact of investment to road infrastructure on tourism development in the Polish-Slovak borderland. *Ekonomicky Casopis*, 62(5), 540–554.
- Nenavath, S. (2021). Does transportation infrastructure impact economic growth in India? *Journal of Facilities Management*. <http://dx.doi.org/10.1108/JFM-03-2021-0032>
- Nguyen, Q. H. (2021). Impact of investment in tourism infrastructure development on attracting international visitors: A nonlinear panel ARDL approach using Vietnam's data. *Economies*, 9(3), 131. <http://dx.doi.org/10.3390/economies9030131>
- Nicula, V., & Elena, P. R. (2014). Business tourism market developments. *Procedia Economics and Finance*, 16, 703–712. [http://dx.doi.org/10.1016/S2212-5671\(14\)00858-2](http://dx.doi.org/10.1016/S2212-5671(14)00858-2)
- OECD. (2021). *OECD.Stat*. Retrieved November 4, 2021 from <https://stats.oecd.org>
- Pradhan, R. P., Arvin, M. B., & Nair, M. (2021). Urbanization, transportation infrastructure, ICT, and economic growth: A temporal causal analysis. *Cities*, 115, 103213. <http://dx.doi.org/10.1016/j.cities.2021.103213>
- R Core Team. (2021). *R: A language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing. Retrieved November 4, 2021 from <https://www.R-project.org>
- Stehel V., & Vochozka M. (2016). The analysis of the economical value added in transport. *Nase More*, 63(3), 185–188.
- Szajt, M. (2018). Changes in expenditure on tourism in European Union countries and economic development. In M. Stanickova, L. Melecky, E. Kovarova, & K. Dvorokova (Eds.), *International Conference on European Integration* (pp. 1428–1435).
- Uslu, A., Alagöz, G., & Güneş, E. (2020). Socio-cultural, economic, and environmental effects of tourism from the point of view of the local community. *Journal of Tourism and Services*, 21(11), 1–21. <http://dx.doi.org/10.29036/jots.v11i21.147>
- Usmani, G., Akram, V., & Praveen, B. (2021). Tourist arrivals, international tourist expenditure, and economic growth in BRIC countries. *Journal of Public Affairs*, 21(2), e2202. <http://dx.doi.org/10.1002/pa.2202>
- Uyen, J. G. (2019). SEM analysis for tourist expenditure in an emerging country. *Economía y Sociedad*, 24(56), 68–81. <http://dx.doi.org/10.15359/eyes.24-56.4>
- Venkatesh, U. (2006). Leisure: meaning and impact on leisure travel behaviour. *Journal of Services Research*, 6, 87–108.
- Vochozka M., & Machova V. (2018). Determination of value drivers for transport companies in the Czech Republic. *Nase More*, 65(4), 197–201. <http://dx.doi.org/10.17818/NM/2018/4SI.6>
- Vochozka M., Rowland Z., & Vrbka J. (2016). Financial analysis of an average transport company in the Czech Republic. *Nase More*, 63(3), 227–236. <https://doi.org/10.17818/NM/2016/SI28>

Vochozka M., & Sheng P. (2016). The application of artificial neural networks on the prediction of the future financial development of transport companies. *Communications: Scientific Letters of the University of Žilina*, 18(2), 62–67.

Wang, Y., & Davidson, M. C. G. (2010). A review of micro-analyses of tourist expenditure. *Current Issues in Tourism*, 13(6), 507–524. <http://dx.doi.org/10.1080/13683500903406359>

Wendt, J. A., Grama, V., Ilieș, G., Mikhaylov, A. S., Borza, S. G., Herman, G. V., & Bógdał-Brzezińska, A. (2021). Transport infrastructure and political factors as determinants of tourism development in the cross-border region of Bihor and Maramureș. A comparative analysis. *Sustainability*, 13(10), 5385. <http://dx.doi.org/10.3390/su13105385>

Wooldridge, J. M. (2010). *Econometric analysis of cross-section and panel data*. London: The MIT Press.

WTTC. (2020). *Total contribution to GDP. Tourism expenditure*. Retrieved November 4, 2021 from <https://wttc.org/>

Wu, L., Zhang, J., & Fujiwara, A. (2013). Tourism participation and expenditure behaviour: Analysis using a scobit based discrete-continuous choice model. *Annals of Tourism Research*, 40, 1–17. <http://dx.doi.org/10.1016/j.annals.2012.09.002>

Yang, C. W., Wu, C. L., & Lu, J. L. (2021). Exploring the interdependency and determinants of tourism participation, expenditure, and duration: An analysis of Taiwanese citizens traveling abroad. *Tourism Economics*, 27(4), 649–669. <http://dx.doi.org/10.1177/1354816619896656>

Zhang, X., Song, C., Wang, C., Yang, Y., Ren, Z., Xie, M., Tang, Z., & Tang, H. (2021). Socioeconomic and environmental impacts on regional tourism across Chinese cities: A spatiotemporal heterogeneous perspective. *ISPRS International Journal of Geo-Information*, 10(6), 410. <http://dx.doi.org/10.3390/ijgi10060410>

Zhang, J., & Zhang, Y. (2021). Tourism, transport infrastructure and income inequality: A panel data analysis of China. *Current Issues in Tourism*. <http://dx.doi.org/10.1080/13683500.2021.1928012>

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Appendix 1

Table 5. PLS models – assumptions

Model	WT	FT ID	FT Time	HT	Model
Classic model – Cluster 1					
DENSITY→BTS	1.83 *	84.98 †	0.26	< 0.01	White 2 Random ind ID
DENSITY→LTS	2.14 **	256.04 †	0.05	2.07	White 2 Random ind ID
DENSITY→DTS	2.07 **	243.42 †	0.05	1.41	White 2 Random ind ID
DENSITY→VEFS	1.55	335.05 †	0.05	0.52	White 2 Random ind ID
URBAN→BTS	1.31	81.98 †	1.04	0.58	White 2 Random ind ID
URBAN→LTS	1.6	184.74 †	0.03	0.1	White 2 Random ind ID
URBAN→DTS	1.48	161.97 †	1.24	0.19	White 2 Random ind ID
URBAN→VEFS	1.17	196.45 †	0.12	0.09	White 2 Random ind ID
INVEST→BTS	1.5	33.55 †	0.53	0.04	White 2 Random ind ID
INVEST→LTS	1.46	82.42 †	0.22	0.01	White 2 Random ind ID
INVEST→DTS	2.41 **	330.69 †	0.13	0.09	White 2 Random ind ID
INVEST→VEFS	1.43	49.56 †	0.25	< 0.01	White 2 Random ind ID
Classic model – Cluster 2					
DENSITY→BTS	2.26 **	92.56 †	0.32	4.13 **	Arellano Within ind ID
DENSITY→LTS	2.82 ***	116.03 †	0.36	6.94 ***	Arellano Within ind ID
DENSITY→DTS	1.86 *	287.33 †	0.1	1.37	White 2 Random ind ID
DENSITY→VEFS	2.29 **	94.65 †	0.47	7.47 ***	Arellano Within ind ID
URBAN→BTS	1.83 *	106.81 †	0.06	1.34	White 2 Random ind ID
URBAN→LTS	1.59	277.03 †	0.2	0.93	White 2 Random ind ID
URBAN→DTS	1.53	1525.68 †	0.11	2.26	White 2 Random ind ID
URBAN→VEFS	1.71 *	179.56 †	0.22	0.27	White 2 Random ind ID
INVEST→BTS	1.92 *	106.77 †	0.29	4.12 **	Arellano Within ind ID
INVEST→LTS	2.33 **	115.78 †	0.28	5.57 **	Arellano Within ind ID
INVEST→DTS	2.23 **	236.16 †	0.21	0.55	White 2 Random ind ID
INVEST→VEFS	2.7 ***	79.25 †	0.39	0.09	White 2 Random ind ID
Lag model – Cluster 1					
DENSITY→BTS	1.81 *	141.02 †	0.3	0.21	White 2 Random ind ID
DENSITY→LTS	2.38 **	386.24 †	0.14	0.06	White 2 Random ind ID
DENSITY→DTS	2.08 **	259.87 †	0.02	0	White 2 Random ind ID
DENSITY→VEFS	1.71 *	549.81 †	0.28	0.06	White 2 Random ind ID
URBAN→BTS	1.25	37.42 †	0.16	0.32	White 2 Random ind ID
URBAN→LTS	1.71 *	137.57 †	0.29	6.87 ***	Arellano Within ind ID
URBAN→DTS	1.44	113.12 †	0.78	0.05	White 2 Random ind ID
URBAN→VEFS	1.41	89.95 †	0.2	0.95	White 2 Random ind ID
INVEST→BTS	1.5	35.44 †	0.42	0.27	White 2 Random ind ID
INVEST→LTS	1.45	86.63 †	0.14	0.16	White 2 Random ind ID
INVEST→DTS	2.39 **	332.53 †	0.01	0.02	White 2 Random ind ID
INVEST→VEFS	1.44	52.77 †	0.27	0.44	White 2 Random ind ID
Lag model – Cluster 2					
DENSITY→BTS	2.48 **	72.18 †	0.51	1.73	White 2 Random ind ID
DENSITY→LTS	2.66 ***	126.98 †	0.55	0.97	White 2 Random ind ID
DENSITY→DTS	1.9 *	244.55 †	0.16	0.25	White 2 Random ind ID
DENSITY→VEFS	2.44 **	90.67 †	0.61	46.26 †	Arellano Within ind ID
URBAN→BTS	1.88 *	87.92 †	0.11	0.9	White 2 Random ind ID
URBAN→LTS	1.4	306.44 †	0.16	0.31	White 2 Random ind ID
URBAN→DTS	1.64	1135.09 †	0.07	0.03	White 2 Random ind ID
URBAN→VEFS	1.79 *	164.59 †	0.17	0.9	White 2 Random ind ID
INVEST→BTS	2.14 **	108.01 †	0.33	2.96 *	White 2 Random ind ID
INVEST→LTS	2.52 **	116.32 †	0.65	0.78	White 2 Random ind ID
INVEST→DTS	2.17 **	268.25 †	0.16	0.41	White 2 Random ind ID
INVEST→VEFS	2.82 ***	72.15 †	0.76	0.01	White 2 Random ind ID

Note: * p-value<0.1; ** p-value<0.05; *** p-value<0.01; † p-value<0.001

Source: own elaboration

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BITCOIN PRICE AS ONE OF BASIC CRYPTOCURRENCIES IN RELATION TO THE BASIC STOCK MARKET'S INDICATORS*

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Abstract. During 2020, factors such as the global pandemic, financial uncertainty and the US election saw an increase in the correlation between bitcoin and gold and the stock market. Both bitcoins and gold rose sharply during 2020, thanks to the relentless press of fiat money by governments and central banks that intend to keep their economies afloat as a result of the coronavirus pandemic. As digital gold, BTC appeals to the cashless Internet economy largely for its features, which include continuous price transparency and a lack of restrictions, disruptions or third-party oversight. The paper focuses on the analysis and identification of the relationship between the value of basic cryptocurrencies and gold price movements, as well as the research hypothesis that the value of the most known and used cryptocurrency bitcoin (BTC) increases with the rising price of gold - a special commodity that serves several functions of the world economy. This issue is currently gaining more and more attention also in context of risk management which is the identification, evaluation, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events or to maximize the realization of opportunities and mobile commerce in the aspect of the impact of modern technologies and mobile communication platforms on consumer behavior and consumer preferences. Innovatively, we have made our observations of the price of bitcoin in relation to price fluctuations in the gold markets in order to develop a predictive model for simulating the development of the price of bitcoin. The mathematical model was developed on the basis of statistical analysis of the observed data.

Keywords: Bitcoin; Bitcoin price; gold price; cryptocurrency; virtual money; financial risk; risk management; electronic and mobile commerce; modern technologies; consumer behavior; consumer preferences.

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JEL Classifications: D30, E30, F39, G20

1. Introduction

The global Cryptocurrencies (CC) market has been growing rapidly over the past few years. The paper deals with the research question whether there exist a relationship between the market value of basic cryptocurrencies and the value of basic stock market's indicators (gold price). Our study is aimed particularly to the one of four top cryptocurrencies - to Bitcoin (BTC) in relation to movements in gold prices.

In general European Central Bank (ECB) defines the virtual currency as a type of unregulated digital (or virtual) currency, that is emitted and usually controlled by developers and used and accepted by members of specific virtual community. According to material ECB19 today the virtual currencies from regulation point of view:

- do not pose any risk to a price stability, providing that money generation remains low,
- have tendency to be volatile, but this does not jeopardize the stability of financial sector due to its limited interconnectedness to real economy, low trading volumes and insufficient user acceptance,
- are not currently regulated or supervised by public authorities, even if they are exposed to credit, liquidity, operational and legal risk,
- can pose a problem for public authorities due to legal uncertainty that surrounds them and can be used by various fraudsters and those who use them to launder their proceeds of crime,
- may pose a reputational risk to central banks if they do not take action against them in a timely manner and prevent any damage that may be incurred by entities in dealing with them,
- fall under the responsibility of central banks due to their similarity to payment systems and lead to the need to investigate their development and to monitor and evaluate them on an ongoing basis.

The advantage of trading bitcoins is reduction of transaction costs to a minimum. Transactions can take place anytime, anywhere and do not require direct interaction between transaction participants. This means significant savings in terms of production, transportation and manipulation of physical money. Transactions are anonymous, accounts are not registered anywhere, and bitcoins are sent directly from one account to another.

On the other hand, one of the often mentioned negatives is the high volatility of the bitcoin exchange rate in relation to official currencies. There is no fixed exchange rate between bitcoins and common currencies. Although bitcoin, due to its decentralized nature, can withstand various interventions by governments, its legal status still remains an issue. The fact that bitcoin still exists in most countries in the so-called grey area (unregulated market), has a major impact on demand from both consumers and traders.

Another argument against bitcoins is that they are used for criminal purposes, such as terrorist financing, the promotion of human trafficking, money laundering or the trafficking of illicit substances of various kinds (Brezo and Bringas 2012). Attributing an increase in criminal activity only to bitcoins is pointless, however it is through unregulated and partly anonymous bitcoins trading that there is room for their abuse. It could be argued that money in forced circulation (e.g. euros or dollars) is also used for criminal purposes. However, potential criminals still have a hard time with the fact that they cannot simply make transfers from one account to another, as they would be easily detectable and law enforcement authorities would have no problem identifying and tracing them through bank transfers. The payment system is strictly regulated and entities are obliged, among other things, to

report any suspicious transactions. In the case of bitcoins, it is really enough that they are transferred from one online account to another without it being possible to trace the originator and recipient of this transfer.

What is innovative is that we have performed our observations of Bitcoin price in relation to the price fluctuations from gold markets in order to develop predictive model for simulation bitcoin price trend. The mathematical model was developed based on the statistical analysis.

2. Theoretical background

Cryptocurrencies are the only type of currencies with the following three features: ensuring pseudo-anonymity, independence from central authority and double spending attack protection. As of 2018, Bitcoin is the most commonly known and used cryptocurrency. Bitcoin (BTC) is a consensual network that enables a new payment system and a complete digital currency. It uses its users and it uses peer-to-peer technology to enable instant electronic payments (Bartos 2015, Nakamoto 2008) based on mathematical proof and relies on cryptographic protocols. It is progressed by consensus network, namely open source software (Giungato et al. 2017, Nakamoto 2008). Bitcoin consists of the Bitcoin protocol, the block chain, distributed mining and transaction script (Antonopoulos 2014). According to his advocates, the ultimate goal is to serve as an alternative to traditional payment systems (Lo and Wang 2014).

On 31 October 2008 an individual or group of individuals operating under the pseudonym Satoshi Nakamoto published the Bitcoin Whitepaper and described it as a purely equivalent version of electronic cash that would allow online payments to be made directly from one side to the other without passing through a financial institution. For many, the true value of Bitcoin is not its currency function, but the technology behind it. Bitcoin is a complex system and its implementation involves a combination of cryptography, algorithms and controlled behavior (Badev and Chen 2014). Everything relies on software operations in the hard core of the system called blockchain (Pagliery 2014). It is a common public book on which the entire Bitcoin network as well as other decentralized cryptocurrencies rely.

The cryptocurrencies and related technologies can bring enormous value to the economic and financial spheres (Perera et al. 2020, Lee 2019, Nathan et al. 2019), which can significantly promote the outbreak of the Fourth Industrial Revolution. As the first decentralized cryptocurrency, Bitcoin is a virtual encrypted digital currency in peer-to-peer (P2P) form which has been invented by Satoshi Nakamoto (Nakamoto 2008). He followed up on an article from 1998 by Wei Dai, a graduate of the University of Washington, who presented the vision of creating a means of exchange that will not pass through the clearing systems of financial institutions and in which it will not be possible to intervene mainly by the government, central banks respectively. Bitcoin is not an absolute novelty, because in the recent past various other digital currencies have already operated, or more precisely they still operate nowadays such as DigiCash, GoldMoney, Pecunix, Web-Money. Bitcoin however is by far the most sophisticated digital currency yet. Unlike regular fiat money a Bitcoin has no physical form, it is not a legal tender, it is not issued by any government bank or organization (Murphy et al. 2015), its supply is not manipulated by a government or other central authority (Yermack 2013), and can be inflated at will (Kurihara and Fukushima 2017).

Each bitcoin created has an assignment to a specific key or address, making each bitcoin unique. A bitcoin transaction occurs when one bitcoin moves from one address to another. The public database records each bitcoin transaction or trade. The database is called a block chain. Hence, a block chain is like a book containing the ledger of all past transactions (Chiu and Koepl 2017, Ivančik 2021). Every bitcoin exists inside the database, so no coins are held outside it. The supply of cryptocurrency depends on mining. Each individual bitcoin is added to the database through this mining process (Dwyer 2015, Prokopenko and Omelyanenko 2020). However, each cryptocurrency works in a different way, leading to different degrees of decentralization. In other words, some

cryptocurrencies may be considered more decentralised than others, depending on the structure of the network and the way of distribution (O’Gorman 2018).

It is important to note that in the early days of the Bitcoin market, buyers were extremely confused about the use of it, and Bitcoin price (BP) was volatile (Carlos 1990, Okorie and Lin 2020, Javaria et al. 2020). There is an abundant literature supporting this conjecture. Dyhrberg (2016) suggests that Bitcoin is beneficial for risk-averse investors to maintain their returns if they face the expected negative shocks to the market. Gajardo et al. (2018) identify that Bitcoin has an interrelationship with commodities. Bouri and Gupta (2019) evidence that bitcoin is a hedge against uncertainty which partly caused by the market fluctuations. As high market fluctuations makes the public panic and the economy unstable, López-Cabarcos et al. (2019) indicate that investor sentiment has certain influences on BP and Bitcoin volatility. Symitsi and Chalvatzis (2019) reveal that there are significant diversification benefits from Bitcoin within traditional asset portfolios, especially in the portfolios of commodities (Guesmi 2019). Cryptocurrencies are used as financial instruments and especially Bitcoin is called alternative investment with diversification benefits (Gogo 2020, Brière et al. 2013).

The modern economy currently uses the so-called fiat money, which is similar to money covered by a particular commodity (e.g. gold during the so-called gold standard), but its concept is completely different in that it is not linked to another commodity (Mura and Buleca 2012, Orgonáš et al. 2020). Enforcement here takes the form of a legal norm by which a public authority establishes and implements a specific system of money and systematically regulates with its legal system the individual aspects of its circulation and protection, thus enshrining the currency as a legal form of money (Godany et al. 2021, Repnikova et al. 2019, Wulandari et al. 2019). The establishment of a currency is always a legal act and the currency is one of the attributes of state sovereignty (Prokopenko and Kornatowski 2018). The state uses the so-called monetary sovereignty, which according to the international principle *lex monetae* means that each state has the exclusive right to create its own currency (and dispose of it), which other states and their bodies must respect. Under the conditions of the European Union, its member states voluntarily give up their own currency on the basis of an international legal obligation which forms part of their Accession Treaty.

3. Research objective and methodology

3.1 Research aim

The main goal of the scientific article is to study and identify the Bitcoin price develop process, as the basic cryptocurrency, in relation to the basic stock market’s indicators - gold price. This study is also done to predict the tendency of the BTC price by simulation model created on the basis of the statistical analysis of observed data. And finally the paper can be useful in decision making for investors, risk management, speculators, entrepreneurs who do business about cryptocurrencies market. All figures and tables are own source.

3.2 Research question and hypothesis

In short, this research study attempts to answer the following research questions: Is there a significant relationship between the value of basic cryptocurrencies and movements in gold prices? Does the value of Bitcoin, the most commonly used cryptocurrency depend on the price fluctuations from gold markets? Based on the set research aim, the research hypothesis was defined.

Research hypothesis H1: It can be stated that with the rising price of basic stock market’s commodities (gold), the price value of Bitcoin increases (BTC as chosen basic cryptocurrency).

3.3 Research Methodology

To achieve the research aim we have studied the secondary obtained data, particularly the reports from the subject areas within the European Union and Slovakia during the observed period 2003 – 2018. The observation and

evaluation of secondary obtained data was performed by usage methods suitable for processing this type of date. We present time series and correlation coefficients.

3.3.1 Time series analysis and time series analysis using neural networks

It is obvious to process large quantity of numbers and data to solve some research problems in economy, so extensity and complexity of calculations requires the usage of special methods and ICT technologies during the analysis. Time series analysis is one of the most important applications of statistical methods in economics. Time Series analysis is useful to study the relationship between different details and times. A time series is a chronologically arranged sequence of values, which are denoted in one of the following ways y_1, y_2, \dots, y_n , or y_t , $t = 1, 2, \dots, n$. The basic assumption is that the time series consists of the following components: trend, seasonal, cyclical and random component. Depending on which mathematical operation is used to connect these components, we distinguish between additive, multiplicative and mixed models. In the following we will assume the following additive model: $Y_t = C_t + E_t$, hence a model with cyclic and random components. Both of components will be modeled and predict separately. Finally, the sum of individual components will lead to the resulting model and predictions.

3.3.2 Correlation coefficient

Correlation coefficient is used to measure the degree of association between two variables. The sample correlation coefficient (also known as the Pearson product moment correlation coefficient) measures the strength of linear association between two variables and it is used for a set of paired data observations (x_i, y_i) under the assumption that both variables have a normal distribution. Pearson coefficient is influenced by extreme values (outliers) that can amplify or dampen the strength of the relationship. The Spearman coefficient is used for the cases with extreme values.

4. Results and discussion

In accordance with the research aim, the input data set consists of time-varying values (in USD) of selected cryptocurrencies (Bitcoin) and time-varying values (in USD) of basic trade commodities (gold) - Table1. Bar chart of the highest and lowest price of Bitcoin in the observed period from 29.4.2013 to 03.04.2020 (Figure 1)-

Table 1. Descriptive statistics of the cyber currency Bitcoin in the monitored period from 29.04.2013 to 03.04.2020

	Open price (USD)	High price (USD)	Low price (USD)	Close price (USD)
Valid N	2532	2532	2532	2532
Mean	3260.34	3348.04	3165.01	3262.85
Median	774.39	786.75	765.14	776.21
Minimum	68.50	74.56	65.53	68.43
Maximum	19,475.80	20,089.00	18,974.10	19,497.40
Lower	383.99	392.13	375.34	384.01
Upper	6454.12	6546.84	6351.95	6463.21
Percentile 10	230.20	233.50	226.48	230.06
Percentile 90	9056.92	9334.87	8799.84	9055.53
Range	19,407.30	20,014.44	18,908.57	19,428.97
Quartile	6070.14	6154.71	5976.62	6079.20
Std.Dev.	3841.18	3960.07	3702.10	3841.28
Skewness	1.16	1.19	1.10	1.15
Kurtosis	0.50	0.65	0.25	0.50

Source: own elaboration



Figure 1. Bar chart of the highest and lowest price of Bitcoin in the observed period from 29.4.2013 to 03.4.2020

Source: own elaboration

4.1. Time Series Analysis

Mixed integrated ARIMA models are designed to describe time series with random trend changes. However, the initial time series does not have to be stationary, but it is necessary that it can be converted to a stationary time series. This conversion is made by differentiating the initial time series. The mixed integrated ARIMA process (p,d,q) is generally described by the model:

$$\varphi(B)W_t = \vartheta(B)\varepsilon_t \quad (1)$$

in which

$$W_t = \Delta^d Y_t \quad (2)$$

where W_t represents a time series constructed by differentiation the initial time series Y_t and d is the order of differentiation and is the difference operator defined as:

$$\Delta^d Y_t = (1 - B)^d Y_t \quad (3)$$

Model ARIMA (p, d, q) can also be written in the form:

$$\varphi(B)(1-B)^d Y_t = \vartheta(B)\varepsilon_t \quad (4)$$

The construction of a mixed integrated model is implemented in two steps:

1. First, the non-stationary time series W_t is converted by differentiation, or more precisely, by a suitable transformation to the time series Y_t . Of course, it is necessary to realize that the initial time series works with this difference.

2. The mixed ARMA model (p, q) is applied to the stationary time series. Seasonally mixed integrated SARIMA processes are used to describe time series whose trend and seasonal component have a stochastic character. Assuming that we have a series of Y_t monthly observations that show significant seasonal effects with the number of seasons $L=12$ during the year.

1. The first step is the construction of the ARIMA model for January observations in the form:

$$\Phi(B^{12})\Delta^{D_1}Y_t = \Theta(B^{12})\eta_t$$

where

$$\Phi(B^{12}) = 1 - \Phi_1 B^{12} - \Phi_2 B^{24} - \dots - \Phi_p B^{12p}$$

is a seasonal autoregressive operator of the P and

$$\Theta(B^{12}) = 1 + \Theta_1 B^{12} + \Theta_2 B^{24} + \dots + \Theta_q B^{12q}$$

is a seasonal moving sum operator of the Q and

$$\Delta_{12} = 1 - B^{12}$$

is the seasonal differential operator to which applies $\Delta_{12}^D Y_t = (1 - B^{12})^D Y_t$.

During the creating process of a suitable model, e.g. if it is selected model ARIMA (p, d, q), which is based on ACF and PACF, it is necessary to define the adequacy measures of the model. The residual analysis of the created model is usually based on the fact, that the residues of an adequate model should be basically white noise only. Therefore, the statistical significance of residues autocorrelations is checked and compared to two standard error

limits, i.e. $\pm \frac{2}{\sqrt{n}}$.

For completeness, we will consider the seasonal model ARIMA ($AR(p)$ – where p is the degree of autocorrelation, represents weighted moving averages for the previous period, $I(d)$ – where d is the degree of integration (differentiation), indicates a linear or polynomial trend, $MA(q)$ – where q is the order of the moving average, indicates weighted moving average for past errors). The analysis of the cybernetic currency Bitcoin due to the need for high computational power and the possibility of gradual verification of the prediction model will be analyzed every year, followed by an analysis of the entire period under study. Due to the nature of ARIMA seasonal models, 4086 models were analyzed for each year.

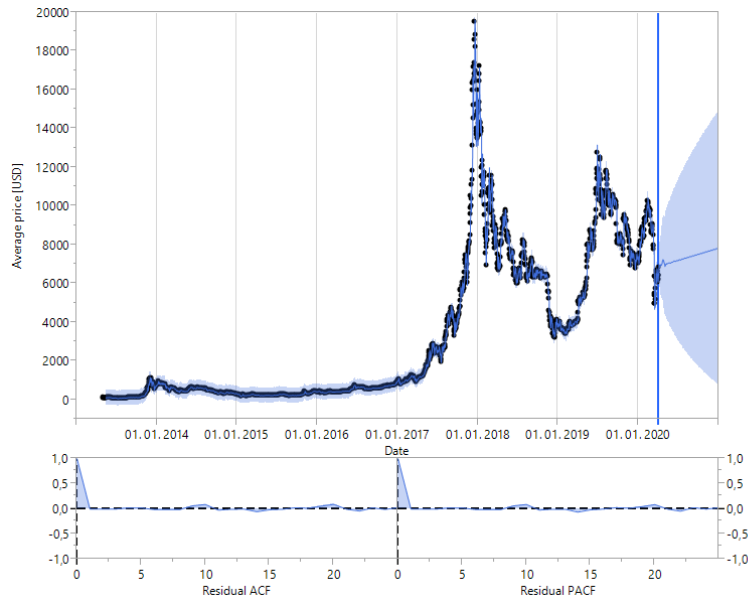


Figure 2. Model SARIMA (2,1,3)(3,1,2) of the Bitcoin Average price over all studied period

Source: own elaboration

Based on the performed analysis it can be stated, that the most appropriate model describing the time series of the Bitcoin Average price over observed period, i.e. from 29 April 2013 to 03 April 2020, is the SARIMA model (2,1,3)(3,1,2)₁₂. The AIC value is of 33866.345 and it is the smallest value for all models from the studied interval of the second step. The SBC (BIC) value is 33930.493 and this value is the second smallest value for the models from the observed interval.

The indicator value MAPE, i.e. the Mean Absolute Percentage Error is 2.304480 and the value of M.A.E. i.e. the mean absolute error of the residues is 81.031849. In the Figure 2 we can see a graphical representation of the SARIMA (2,1,3) (3,1,2) model, including the prediction and also values of the residual autocorrelation and residual partial autocorrelation function. Figure 3 depicts the error of the SARIMA (2,1,3) (3,1,2) model compared to the real prices of the cryptocurrency Bitcoin in the entire monitored period from 29 April 2013 to 3 April 2020.

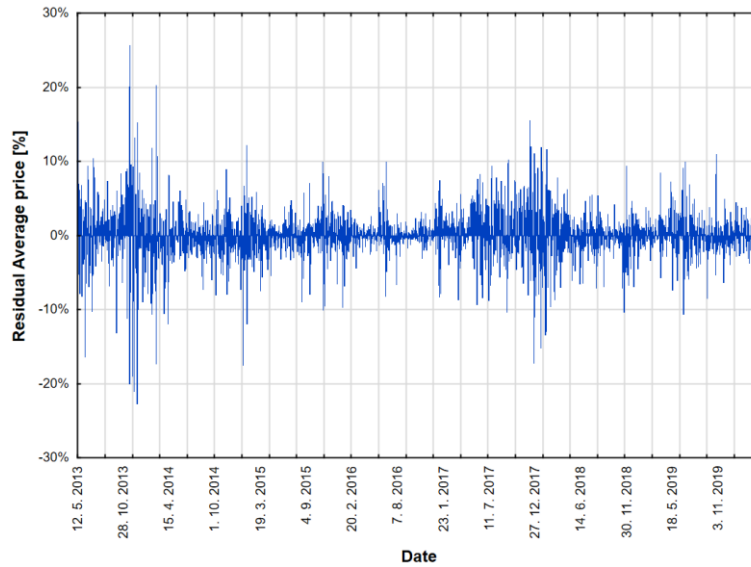


Figure 3. Error of the SARIMA model (2,1,3)(3,1,2) of the Bitcoin Average price over all examined period

Source: own elaboration

The average value of residuum between the actual average value of the price of the cryptocurrency Bitcoin during the whole observed period and the value of the cryptocurrency Bitcoin calculated by model SARIMA (2,1,3) (3,1,2) is 0.021% with a standard deviation of 3.49%. The minimum deviation value is -22.7% and the maximum deviation value is 25.7%. The lower quartile represents a value of -1.44% and the upper quartile 1.51%. The mean (middle) value of observed data set is expressed by the median, which value is 0.00257%. Median has occurred a better representative of mean value than the arithmetic mean according to the results of Shapiro-Wilk test, the achieved value of significance $p=0.00001$. The basic characteristics of the reference model SARIMA (2,1,3) (3,1,2) are given in Table 2.

Table 2. Summary of model SARIMA (2,1,3)(3,1,2) 2013-2020

Parameter	Value
DF	2508
Sum of Squared Errors	98157013
Variance Estimate	39137.565
Standard Deviation	197.832164
Akaike's 'A' Information Criterion	33866.3451
Schwarz's Bayesian Criterion	33930.4929
RSquare	0.99732781
RSquare Adj	0.99731715
MAPE	2.30448005
MAE	81.0318485
-2LogLikelihood	33844.3451

Source: own elaboration

It should be noted here that the SARIMA (2,1,3) (3,1,2) model describes the real values of the average price of the cryptocurrency Bitcoin with an accuracy of 99.732%. The basic characteristics of the reference model SARIMA (2,1,3) (3,1,2) are shown in Table 3.

Table 3. Model SARIMA (2,1,3)(3,1,2) 2013-2020

Term	Factor	Lag	Estimate	Std Error	t Ratio	Prob> t
AR1,1	1	1	-0.70121	0.081216	-8.63	<.0001*
AR1,2	1	2	0.134985	0.060959	2.21	0.0269*
AR2,12	2	12	-0.45586	0.122721	-3.71	0.0002*
AR2,24	2	24	-0.09347	0.022858	-4.09	<.0001*
AR2,36	2	36	-0.12268	0.020478	-5.99	<.0001*
MA1,1	1	1	-1.02359	0.079951	-12.8	<.0001*
MA1,2	1	2	-0.09525	0.077416	-1.23	0.2187
MA1,3	1	3	0.091595	0.024954	3.67	0.0002*
MA2,12	2	12	0.594213	0.123472	4.81	<.0001*
MA2,24	2	24	0.405787	0.123248	3.29	0.001*
Intercept	1	0	0.006029	0.038465	0.16	0.8755

Source: own elaboration

Based on the developed time series model SARIMA (2,1,3)(3,1,2)2013-2020, which was created on the basis of Bitcoin Average price data set during the observed period from 29 April 2013 to 3 April 2020, we were able to predict the Bitcoin price. In the Figure 4 is displayed a prediction of the price of cryptocurrency Bitcoin for time range from 04 April 2020 to 29 June 2020 and also the actual market value of Bitcoin.

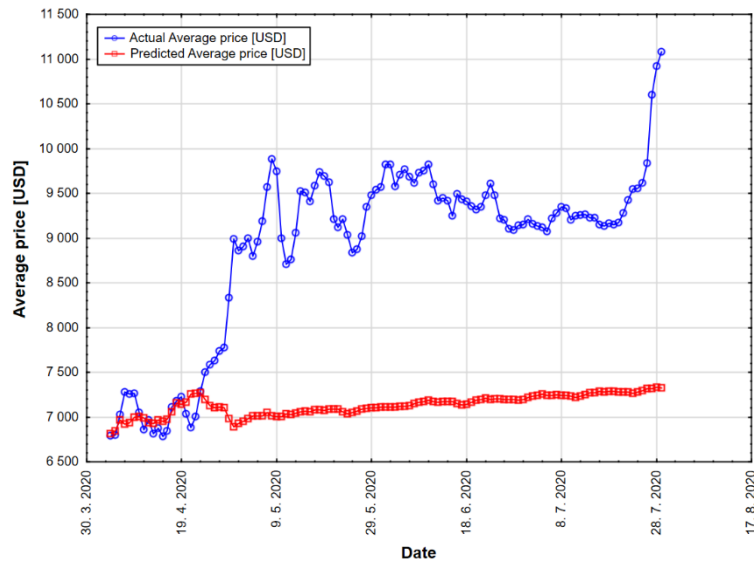


Figure 4. Predictive model SARIMA (2,1,3)(3,1,2) 2013-2020 from 04 April 2020 to 29 July 2020

Source: own elaboration

From graphically presented information in Figure 4, about actual and predicted average price of Bitcoin, it is clear that in the interval of about 15 days from the beginning of the model verification, the model SARIMA (2,1,3) (3,1,2) 2013-2020 can fairly accurately and effectively describe the actual market prices of the cryptocurrency Bitcoin. With increasing time, however, the predictive power of the SARIMA (2,1,3) (3,1,2) 2013-2020 model decreases sharply, which can also be attributed to the very rapidly changing situation on the stock exchange of individual economies caused by the global pandemic COVID- 19.

The differences between the actual market price of the cryptocurrency Bitcoin and the price predicted by the created model SARIMA (2,1,3) (3,1,2) 2013-2020 is displayed in Figure 5. The average value of residuals is 18.80% with the residual standard deviation of 9.71%. The minimum residual value (min residuum) is -5.36% and the is 33.9%. The value of the lower quartile of residuum is 20.2% and of the upper quartile 24.6%. The mean value expressed as a median is 21.9%.

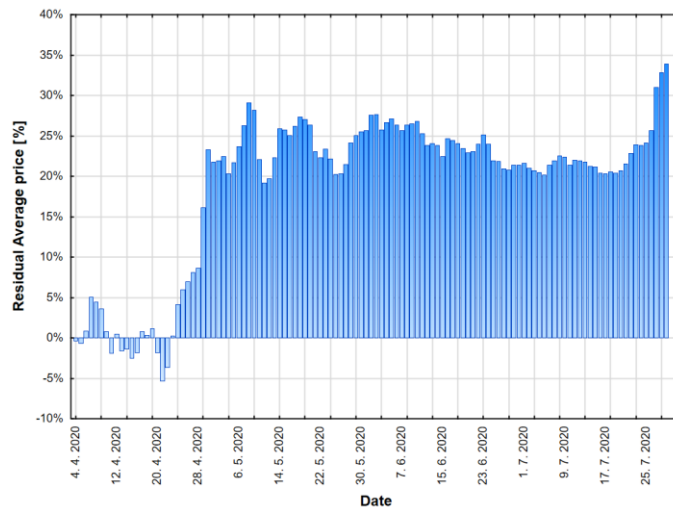


Figure 5. Bitcoin price prediction error by the model SARIMA (2,1,3)(3,1,2) 2013-2020 from 04 April 2020 to 29 July 2020

Source: own elaboration

In accordance with the chosen confidence interval of individual members of the created model SARIMA (2,1,3)(3,1,2)2013-2020 it is possible to simulate different behavior of studied data during the observed time period from 04 April 2020 to 29 July 2020 (Figure 6).

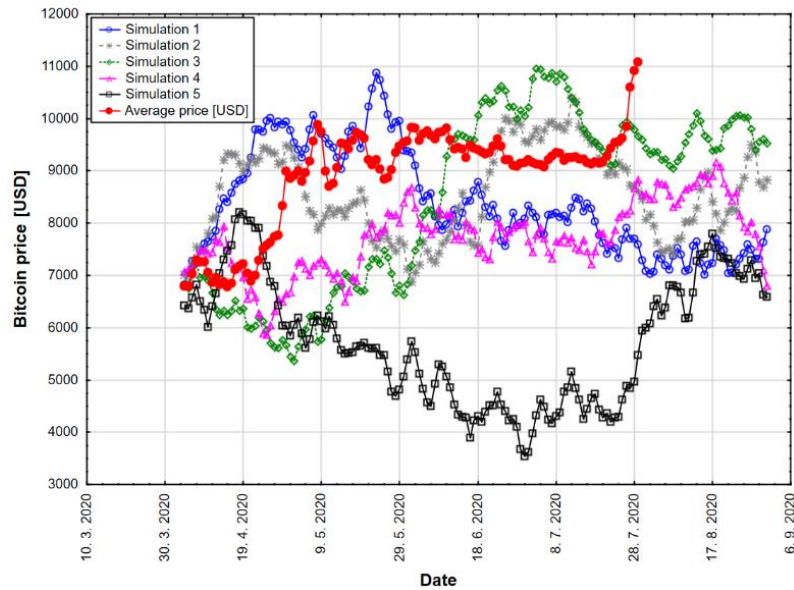


Figure 7. Simulation of Bitcoin average price by the model SARIMA (2,1,3)(3,1,2) 2013-2020 from 04 April 2020 to 29 July 2020

Source: own elaboration

Table 4 implies that simulation 2 appears to be the most suitable simulation. Applying this simulation the average value of residuals between simulated and real data is 1.349% with a minimum value of -37.592% and a maximum value of 29.952%.

Table 4 . Model SARIMA (2,1,3)(3,1,2) 2013-2020

Variable	Descriptive Statistics (Simulation - prediction)						
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile
Sim 1	117	1.082%	5.216%	-39.632%	31.492%	-8.497%	12.525%
Sim 2	117	1.349%	1.750%	-37.592%	29.952%	-7.314%	14.376%
Sim 3	117	8.744%	7.913%	-19.987%	41.964%	-5.093%	23.799%
Sim 4	117	14.725%	16.833%	-15.334%	31.774%	12.942%	19.887%
Sim 5	117	37.060%	46.085%	-16.763%	61.265%	32.057%	52.648%

Source: own elaboration

4.2. Correlation analysis of the observed variables

The strength of linear association between two jointly distributed random variables X and Y is measured and defined by the correlation coefficient r_{xy} , which takes a value between -1 and 1. A sample correlation coefficient $r_{xy}=0$ (or is very close to zero) indicates that there is no linear association between the two variables, and their distributions can then be thought of as being independent of each other. The closer the sample correlation coefficient is to either 1 or -1, the stronger is the linear association (in case of 1 there is a strong positive linear association between two variables, in case of -1 it is interpreted as strong negative linear association). Correlation of $\pm 0,5$ are interpreted as relatively weak linear association.

Let assume that we have a set of n paired data observations (xi, yi) of two random variables X and Y, i=1,2,..., n. Then the strength of linear association between the two variables X and Y is measured by the sample correlation coefficient r_{xy} defined as:

$$r_{xy} = \frac{\text{cov}(xy)}{\sigma_x \cdot \sigma_y} \quad (5)$$

where cov (xy) represents covariance of X and Y, σ_x is a standard deviation of X and σ_y is a standard deviation of variable Y. Covariance coefficient of X and Y is defined by the formula: $\text{cov}(xy) = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x}) \cdot (y_i - \bar{y})$

Setting this to the formula for r_{xy} we obtain:

$$r_{xy} = \frac{n \cdot \sum_{i=1}^n x_i \cdot y_i - \sum_{i=1}^n x_i \cdot \sum_{i=1}^n y_i}{\sqrt{n \cdot \sum_{i=1}^n x_i^2 - \left(\sum_{i=1}^n x_i\right)^2} \cdot \sqrt{n \cdot \sum_{i=1}^n y_i^2 - \left(\sum_{i=1}^n y_i\right)^2}} \quad (6)$$

Table 5 presents correlation coefficients between examined variables (Gold vs Bitcoin, Gold vs Ethereum, Gold vs XRP), average price was taken into account. The results listed in Table 5 confirm that there is a positive linear association between average price of gold and average price of selected cryptocurrencies (Bitcoin, Ethereum, XRP). Moreover, in all cases this association is statistically significant at the significance level of $\alpha = 5\%$. According to Cohen scale there occurs a strong linear association (0.5-0.7) between Bitcoin Average price and Gold Average price, the value of the correlation coefficient in this case reaches 58.85%. Reflecting the Cohen scale (0.1-0.3), there is a weak linear association between the average price of the cryptocurrency Ethereum and the average price of gold, the value of correlation coefficient is 0.1729 in this case. A weak linear association is also between XRP Average price and Gold Average price, the correlation coefficient is 0.1100.

Table 5. Correlation analysis between observed cryptocurrencies and gold (average price).

Variable	Correlations Marked correlations are significant at p < ,05000 N=1299		
	Average price (USD)- Bitcoin	Average price (USD) - Ethereum	Average price (USD) - XRP
Average price (USD) - GOLD	0.5885	0.1729	0.1100
	p=0.000	p=0.000	p=0.000

Source: own elaboration

Based on the results presented in Table 5 we can confirm and accept the hypothesis H1 mentioned above. Summary of the research hypothesis H1 verification: based on the performed statistical analysis it can be concluded that the research hypothesis H1 is accepted.

Cryptocurrencies as a phenomenon of these days are governed by their own rules (Bulinska-Stangrecka and Bagieńska 2019), but with the use of mathematical-statistical analysis it is possible to predict their future development and their mutual relations, although with only a limited time advance. It is also possible to define the relationship between the studied cryptocurrencies and currently one of the most stable market commodities, gold. Both the average price of gold and the average price of the investigated cryptocurrency Bitcoin, as the most famous cryptocurrency, is nowadays in a very unstable state associated with the global pandemic COVID-19, as it is evidenced by high values of prediction residuals for individual cryptocurrencies. However, the movement in the prices of cryptocurrencies is not only dependent on time, but is also influenced by a number of other factors: economic, political and others. In any case, cyber currencies hold an irreplaceable place in the money market and

therefore, in the future, it is absolutely necessary to create complex models with consideration of other significant effects on the changes in their prices.

Taken a look at Bitcoin's responses to macroeconomic events during 2020, we can say that it has fulfilled its role as a value holder. In the period under review (31.10.2020), about 35% is trading above the pre-crisis price and 100% above the January 2020 price. Unlike gold, which has increased in value by around 25% since the new year. The current price of \$ 13,900 (€ 11,900) has already surpassed the 2019 maximum and is approaching a historical maximum. In case of interest, it is possible to buy only a part of Bitcoin (at least 0.00000001 BTC).

The advantage of Bitcoin over gold is also in its storage. If the applicant wants to buy physical gold, he must pay extra. And when selling, he pays again. Bitcoin can be bought on the stock exchange at any time at the current market value, sent to a wallet in your laptop, mobile, or even a paper wallet, and unless the entire Internet (and with it our civilization) is permanently collapsed, purchased coins are only theirs and no one will ever take those from them. Of course, it is possible to argue that in the case of the apocalypse, the owner can't do anything with some virtual coins but it is appropriate to add that even gold isn't very useful in that scenario. Owner will have to sell it or exchange it for something of real value, and there is no guarantee that there will be interest in this precious metal in post-apocalyptic civilization (Gruenbichler et al. 2021).

5. Conclusions

Information in this paper could be useful also for risk management, which is the process of identifying, assessing and controlling threats to an organization's capital and earnings (Bulinska-Stangrecka and Bagieńska 2018, Lu et al. 2021). These threats, or risks, could stem from a wide variety of sources, including financial uncertainty, legal liabilities, strategic management errors, accidents and natural disasters (Milošovičová et al. 2018, Meyer et al. 2017, Hussain et al. 2020, Gavurova et al. 2018, Gavurova et al. 2020a, Kocisova et al. 2018). The study also provides many insights and perspectives that can inspire and encourage further research into financial, economic and innovative aspects in other sectors (Gavurova et al. 2020b, Gavurova et al. 2021a, Gavurova et al. 2021b, Kelemen et al. 2019, Polishchuk et al. 2019).

In 2020 factors such as the global pandemic, financial uncertainty, and the election in the USA have seen an increase in the Bitcoin correlation to gold and the stock market. The forex market is renowned as the single most volatile financial entity of its type, and there are several factors that contribute to this. One of the most pressing is the diverse range of macroeconomic factors that impact on currency values, including domestic and international monetary policy. Increased public spending has also begun to impact on precious metals and stocks, while we've also seen a strong correlation between the performance of these assets and Bitcoin (Peracek et al. 2020). Bitcoin, however, seems to be very susceptible to the price fluctuations from gold markets.

Historically, Bitcoin (which remains the world's market-leading cryptocurrency with a total market cap of approximately \$193 billion) has enjoyed a loose relationship with other assets.

However, there are signs that this may be changing as the coronavirus continues to grip the financial markets, with the research teams having previously highlighted a 70% correlation between Bitcoin and gold price declines on multiple occasions. This trend has coincided with the decline of major currencies and their value, and it has become particularly pronounced throughout 2020. In July, the Bitcoin correlation to gold and stocks had peaked at all-time highs globally (Sopiah et al. 2020), highlighting the growing maturity of the asset and its rate of adoption across a diverse range of markets. Bitcoin seems to be very susceptible to the price fluctuations from gold markets. Bitcoin is starting to behave more like a store of value and is potentially being used as a safe-haven asset during global uncertainty in traditional markets.

References

- Antonopoulos, A. M. (2014), *Mastering Bitcoin: Unlocking Digital Crypto-Currencies*, Sebastopol: O'Reilly Media Inc. ISBN: 9781449374044.
- Badev, A., & Chen, M. (2014). Bitcoin: Technical background and data analysis. Washington, D.C.: Finance and Economics Discussion Series. retrieved from: <http://www.federalreserve.gov/econresdata/feds/2014/files/2014104pap.pdf>
- Bartos, J. (2015), Does Bitcoin follow the hypothesis of efficient market? *International Journal of Economic Sciences*, 4(2), 10-23. <https://doi.org/10.20472/ES.2015.4.2.002>
- Bouri, E., & Gupta, R. (2019). Predicting Bitcoin returns: Comparing the roles of newspaper- and internet search-based measures of uncertainty. *Finance Research Letters*, 38, 101398. <https://doi.org/10.1016/j.frl.2019.101398>
- Brière, M., Oosterlinck, K., & Szafarz, A. (2013). Virtual Currency, Tangible Return: Portfolio Diversification with Bitcoins. Centre Emile Bernheim. *Journal of Asset Management*, 16(6), 365–373. <https://doi.org/10.1057/jam.2015.5>
- Brezo, F., & Bringas, P. G. (2012). Issues and Risks Associated with Cryptocurrencies such as Bitcoin. SOTICS 2012: The Second International Conference on Social Eco-Informatics. ISBN: 978-1-61208-228-8.
- Bulinska-Stangrecka, H., & Bagieńska, A. (2019). HR Practices for Supporting Interpersonal Trust and Its Consequences for Team Collaboration and Innovation. *Sustainability*, 11(16), 4423, <https://doi.org/10.3390/su11164423>
- Bulinska-Stangrecka, H., & Bagieńska, A. (2018). Investigating the Links of Interpersonal Trust in Telecommunications Companies. *Sustainability*, 10(7), 2555, <https://doi.org/10.3390/su10072555>
- Carlos, E. S. (1990). Long-term evolution of oil prices 1860–1987. *Energy Policy*, 18(2), 170-174. [https://doi.org/10.1016/0301-4215\(90\)90142-Q](https://doi.org/10.1016/0301-4215(90)90142-Q)
- Dyhrberg, A. H. (2016). Bitcoin, gold and the dollar - A GARCH volatility analysis. *Finance Research Letters*, 16, 85-92. <https://doi.org/10.1016/j.frl.2015.10.008>
- Dwyer, P. G. (2015) The economics of Bitcoin and similar private digital currencies. *Journal of Financial Stability*, 17, 81-91. Retrieved from: <http://www.sciencedirect.com/science/article/pii/S1572308914001259>
- Gajardo, G., & Kristjanpoller, W.D., Minutolo, M. (2018). Does Bitcoin exhibit the same asymmetric multifractal cross-correlations with crude oil, gold and DJIA as the Euro, Great British Pound and Yen? *Chaos, Solitons and Fractals*, 109, 195-205. <https://doi.org/10.1016/j.chaos.2018.02.029>
- Gavurova, B., Belas, J., Bilan, Y., & Horak, J. (2020a). Study of legislative and administrative obstacles to SMEs business in the Czech Republic and Slovakia. *Oeconomia Copernicana*, 11(4), 689-719. <https://doi.org/10.24136/oc.2020.028>
- Gavurova, B., Belas, J., Valaskova, K., Rigelsky, M., & Ivankova, V. (2021a). Relations between infrastructure innovations and tourism spending in developed countries: A macroeconomic perspective. *Technological and Economic Development of Economy*, 27(5), 1072-1094. <https://doi.org/10.3846/tede.2021.15361>
- Gavurova, B., Belas, J., Zvarikova, K., Rigelsky, M., & Ivankova, V. (2021b). The effect of education and R&D on tourism spending in OECD countries: An empirical study. *Amfiteatru Economic*, 23(58), 806-823. <https://doi.org/10.24818/EA/2021/58/806>
- Gavurova, B., Dujcak, M., Kovac, V., & Kotásková, A. (2018). Determinants of successful loan application on peer-to-peer lending market. *Economics & Sociology*, 11(1), 85-99. <https://doi.org/10.14254/2071-789X.2018/11-1/6>
- Gavurova, B., Ivankova, V., Rigelsky, M., & Přívarová, M. (2020b). Relations between tourism spending and global competitiveness – An empirical study in developed OECD countries. *Journal of Tourism and Services*, 21(11), 38-54. <https://doi.org/10.29036/jots.v11i21.175>
- Giungato, P., Rana, R., Tarabella, A., & Tricase, C. (2017), Current trends in sustainability of Bitcoins and related blockchain technology, *Sustainability*, 9(12), 2214. <https://doi.org/10.3390/su9122214>

Godany, Z., Machova, R., Mura, L., & Zsigmond, T. (2021). Entrepreneurship Motivation in the 21st Century in Terms of Pull and Push Factors. *TEM JOURNAL-Technology Education Management Informatics*, 10(1), 334-342. <https://doi.org/10.18421/TEM101-42>

Gogo, J. (2020) Bitcoin and Gold Correlation Reaches Record High 70%. Retrieved from: <https://news.bitcoin.com/category/finance/author/jeffrey-gogo/>

Gruenbichler, R., Klucka, J., Haviernikova, K., & Strelcova, S. (2021). Business Performance Management in Small and Medium-Sized Enterprises in the Slovak Republic: An Integrated Three- Phase-Framework for Implementation. *Journal of Competitiveness*, 13(1), 42–58. <https://doi.org/10.7441/joc.2021.01.03>

Guesmi, K., Saadi, S., Abid, I., & Ftiti, Z. (2019). Portfolio diversification with virtual currency: Evidence from bitcoin. *International Review of Financial Analysis*, 63, 431-437. <https://doi.org/10.1016/j.irfa.2018.03.004>

Chiu, J., & Koepl, T. (2017), The Economics of Cryptocurrencies-Bitcoin and Beyond, Queen's Economics Department Working Paper, No. 1389, Ontario. Retrieved from: http://qed.econ.queensu.ca/working_papers/papers/qed_wp_1389.pdf

Hussain, H., I., Kot, S., Kamarudin, F., & Mun, W., C. (2020). The nexus of competition freedom and the efficiency of microfinance institutions. *Journal of Competitiveness*, 12(2), 67–89. <https://doi.org/10.7441/joc.2020.02.05>

Ivančík, R. (2021). Treatise on Postulates of Security Theory. *Security Science Journal*, 1. <https://doi.org/10.37458/ssj.2.1.7>

Javaria, K., Masood, O., & Garcia, F. (2020). Strategies to manage the risks faced by consumers in developing e-commerce. *Insights into Regional Development*, 2(4), 774-783. [http://doi.org/10.9770/IRD.2020.2.4\(4\)](http://doi.org/10.9770/IRD.2020.2.4(4))

Kelemen, M., Polishchuk, V., Gavurová, B., Szabo, S., Rozenberg, R., Gera, M., Kozuba, J., Andoga, R., Divoková, A., & Blišťan, P. (2019). Fuzzy model for quantitative assessment of environmental start-up projects in air transport. *International Journal of Environmental Research and Public Health*, 16(19), 3585. <https://doi.org/10.3390/ijerph16193585>

Kocisova, K., Gavurova, B., & Behun, M. (2018). The evaluation of stability of Czech and Slovak banks. *Oeconomia Copernicana*, 9(2), 205-223. <https://doi.org/10.24136/oc.2018.011>

Kurihara, Y., & Fukushima, A. (2017), The market efficiency of Bitcoin: A weekly anomaly perspective. *Journal of Applied Finance & Banking*, 7(3), 57-64. Retrieved from: http://www.sciencpress.com/Upload/JAFB%2fVol%207_3_4.pdf

Lee, J. Y. (2019). A decentralized token economy: how blockchain and cryptocurrency can revolutionize business. *Business Horizons*, 62(6), 773-784. <https://doi.org/10.1016/j.bushor.2019.08.003>

Lo, S., & Wang, J. C. (2014). Bitcoin as Money? Boston: Federal reserve bank of Boston, 2014. Retrieved from: <http://www.bostonfed.org/economic/current-policy-perspectives/2014/cpp1404.pdf>

López-Cabarcos, M., A., Pérez-Pico, A., M., Piñeiro-Chousa, J., & Šević, A. (2019). Bitcoin volatility, stock market and investor sentiment. Are they connected? *Finance Research Letters*, 38, 101399. <https://doi.org/10.1016/j.frl.2019.101399>

Lu, J. B., Liu, Z. J., Tulenty, D., Tsvetkova, L., & Kot, S. (2021). Implementation of stochastic analysis in corporate decision-making models. *Mathematics*, 9(9), 1041. <https://doi.org/10.3390/math9091041>

Meyer, N., Meyer, D., & Kot, S. (2017). The development of a process tool for improved risk management in local government. *Quality-Access to Success*, 18, 425-429.

Milošovičová, P., Mittelman, A., Mucha, B., & Peráček, T. (2018). The particularities of entrepreneurship according to the trade licensing act in the conditions of the Slovak Republic. Proceedings of the 31st International Business Information Management Association Conference, IBIMA 2018: Innovation Management and Education Excellence through Vision 2020, pp. 2736–2745

Mura, L., & Buleca, J. (2012). Evaluation of Financing Possibilities of Small and Medium Industrial Enterprises. *Procedia Economics and Finance*, 3, 217-222. [https://doi.org/10.1016/S2212-5671\(12\)00143-8](https://doi.org/10.1016/S2212-5671(12)00143-8)

Murphy, E. V., Murphy, M. M., & Seitzinger, M. V. (2015), Bitcoin: Questions, answers and analysis of legal issues, Congressional Research Service. Retrieved from: <https://fas.org/sgp/crs/misc/R43339.pdf>

Nakatomo, S. (2008). Bitcoin: A peer-to-peer electronic cash system (unpublished). Retrieved from: <http://bitcoing.org/bitcoin.pdf>

Nathan, R. J., Victor, V., Gan, C. L., & Kot, S. (2019). Electronic commerce for home-based businesses in emerging and developed economy. *Eurasian Business Review*, 9(4), 463–483. <https://doi.org/10.1007/s40821-019-00124-x>

O’Gorman, B. (2018). Cryptojacking: A Modern Cash Cow. Retrieved from: <https://www.symantec.com/blogs/threat-intelligence/cryptojacking-modern-cash-cow>

Okorie, D. I., & Lin, B. (2020). Crude oil price and cryptocurrencies: evidence of volatility connectedness and hedging strategy. *Energy Economics*, 87, 104703. <https://doi.org/10.1016/j.eneco.2020.104703>

Orgonáš, J., Paholková, B., & Drábik, P. (2020). Franchising Modern Form of Business for Small and Medium Sized Enterprises in the 21 st. century. *Management Studies*, 8(1), 69–73.

Pagliery, J. (2014). Bitcoin and the future of money. USA: Triumph Books LLC, 2014. ISBN 978-1-62937-036-1.

Peracek, T., Vilcekova, L., & Strazovska, L. (2020). Selected problems of family business: A case study from Slovakia. *Acta Polytechnica Hungarica*, 17(7), 145–162. <https://doi.org/10.12700/APH.17.7.2020.7.8>

Perera, S., Nanayakkara, S., Rodrigo, M. N. N., Senaratne, S., & Weinand R. (2020). Blockchain technology: is it hype or real in the construction industry? *Journal of Industrial Information Integration*.

Polishchuk, V., Kelemen, M., Gavurová, B., Varotsos, C., Andoga, R., Gera, M., Christodoulakis, J., Soušek, R., Kozuba, J., Blišťan, P., & Szabo, S., Jr. (2019). A fuzzy model of risk assessment for environmental start-up projects in the air transport sector. *International Journal of Environmental Research and Public Health*, 16(19), 3573. <https://doi.org/10.3390/ijerph16193573>

Prokopenko, O., & Kornatowski, R. (2018). Features of Modern Strategic Market-Oriented Activity of Enterprises. *Mark. Manag. Innov.*, XIV, 295–303. <https://doi.org/10.21272/mmi.2018.1-22>

Prokopenko, O., & Omelyanenko, V. (2020). Intellectualization of the Phased Assessment and Use of the Potential for Internationalizing the Activity of Clusters of Cultural and Creative Industries of the Baltic Sea Regions. *TEM Journal* 9(3), 1068–1075. <https://doi.org/10.18421/tem93-31>

Repnikova, V. M., Bykova, O. N., Skryabin, O. O., Morkovkin, D. E., & Novak, L. V. (2019). Strategic Aspects of Innovative Development of Entrepreneurial Entities in Modern Conditions. *Int. J. Eng. Adv. Technol.*, 8, 32–35.

Sopiah, S., Kurniawa, D. T., Nora, E., & Narmaditya, B. S. (2020). Does Talent Management Affect Employee Performance? The Moderating Role of Work Engagement. *J. Asian Finance, Econ. Bus.*, 7, 335–341. <https://doi.org/10.13106/jafeb.2020.vol7.no7.335>

Symitsi, E., & Chalvatzis, K. J. (2019). The economic value of Bitcoin: A portfolio analysis of currencies, gold, oil and stocks. *Research in International Business and Finance*, 48, 97–110. <https://doi.org/10.1016/j.ribaf.2018.12.001>

Yermack, D. (2013). Is Bitcoin a real currency? An Economic Appraisal, National Bureau of Economic Research Working Paper, 19747, pp. 1–22. Retrieved from: <http://www.nber.org/papers/w19747>

Wulandari, D., Utomo, S. H., Narmaditya, B. S., & Kamaludin, M. (2019). Nexus between Inflation and Unemployment: Evidence from Indonesia. *Journal of Asian Finance, Economics and Business*, 6(2), 269–275. <https://doi.org/10.13106/jafeb.2019.vol6.no2.269>

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