

NATIONAL CULTURE AS A DETERMINANT OF FIRMS' INNOVATIVE PERFORMANCE

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ABSTRACT

General innovation performance of the EU is improving, yet progress is too slow and performance gaps still remain wide within European Union. Therefore, there is a growing interest in circumstances which influence this situation. In their previous research, the authors of this paper have already proved that cultural diversity affect the innovative capacity of societies, hence the goal of this study was to explore how important, in the context of other determinants of firms' innovative performance, are socio-cultural determinants. The results revealed that they are less relevant than technological and economic determinants but affirmed to be more significant than political, legal and ecological ones. In order to reach the conclusions, a review of scientific literature, comparative judgement of EU performance and correlation analysis were used.

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Introduction

"Innovation outputs are undoubtedly highly related to innovation inputs, such as R&D, but innovation processes are also strongly determined by culture" (Kaasa 2013). Together with Kassa, a lot of other researchers suggest a significant relationship between a nation's culture and its level of innovativeness (e.g. Barnett 1953; Shane 1993; Patterson 1999; Hayton et al. 2002; Hussler 2004; Didero et al. 2008; Lundvall 2009; Kaasa and Vadi 2010; Ofori-Dankwa 2013; Khan and Cox, 2017; Andrijauskiene and Dumciuviene 2017).

In order to prove the mentioned relationship, different instruments and data are used. Self-employment rates, royalty

and license fees, trademarks, technology adoption rates, patents, R&D expenditures and even a number of research centers are adopted as variables of innovation (Khan and Cox 2017). For the cultural part, scientists are choosing between Values Orientation Theory (Kluckhohn and Strodtbeck 1961), Trompenaars and Hampden-Turner (2004), GLOBE (House et al. 2004), European Social Survey (Kaasa 2009) and Hofstede's Cultural Dimensions Theory (Jones and Teegan 2001; Rinne et al. 2012; Syed and Malik, 2014; Andrijauskiene and Dumciuviene 2017; Prim et al. 2017).

Though scholars claim that culture affects the knowledge flows and innovation

performance and that it is not enough to increase the amount of money spent on R&D or infrastructure – it might also be necessary to change the values of people to those that encourage innovative activity (Shane 1993; Hussler 2004), a number of questions remain, for example: is there a disparity between theory and reality? how different are the opinions of scholars and practitioners? how important, according to the representatives of companies, are socio-cultural determinants of innovation performance? Given the deliberations presented, the goal of the study is to explore how important, in the context of other determinants of firms' innovation performance, are socio-cultural determinants. Review of scientific literature, comparative judgement of EU performance and correlation analysis were used in order to reach the conclusions. This paper starts with a literature review, which is followed by a presentation of similarities and differences of culture and innovation in EU member states. The next part analyses the results of the research and statistical analysis is used to form credible conclusions.

1. The relationship between culture and innovation: literature review

It is generally agreed that the national culture can be defined as a distinctive set of norms, beliefs, values and behaviors within the population of a country. Despite all criticism (e.g. Steenkamp 2001; Brons 2006; Javidan et al. 2006), the most recognized and cited study about identification and measurement of the dimensions of culture has been provided by the Dutch researcher Geert Hofstede (Dickson et al. 2003).

Originally, the theory of Geert Hofstede proposed four dimensions along which

cultural values could be analyzed: Power Distance Index, Individualism versus Collectivism, Masculinity versus Femininity and Uncertainty Avoidance Index. All of the four dimensions in that model were derived from Hofstede's analysis of an existing IBM employee database. Due to the criticism for limitations of the model, such as an old data, one company approach and too few dimensions, in a subsequent publication Hofstede added a fifth dimension – Long Term Orientation versus Short Term Orientation. It was based on a study of students' values in 23 countries around the world, using a Chinese Values Survey (CVS), initiated by Michael Harris Bond. In 2010, Michael Minkov's World Values Survey data analysis of 93 representative samples of national populations allowed Geert Hofstede a new calculation of the fifth and led to identify the sixth and last dimension: Indulgence versus Restraint (Itim International 2017).

The description of six dimensions can be found in Table 1. Hofstede (2011) explains that national culture scores should not be used for stereotyping individuals and the links are statistical. Furthermore, it is important to note that the scores reflect values transferred from parents to children which rarely change in later life so they can be assumed to be stable over period of time. As there is no standard for the degree of cultural dimensions, scores reflect the differences between societies and the relative position to each other (Beugelsdijk et al. 2014).

Table 1. Hofstede's cultural dimensions

Dimension	Short description	Score (0-100)
Power Distance Index (PDI)	The degree to which the less powerful members of a society accept and expect that power is distributed unequally.	Low (<50) – society strives to equalize the distribution of power and demand justification for inequalities of power. High (>50) – society accepts a hierarchical order in which everybody has a place.
Masculinity versus Femininity (MAS)	The degree to which the members of a society either seeks for achievement, heroism, assertiveness and material rewards for success or prefer cooperation, modesty, social care and quality of life.	Low (<50) – feminine society that is oriented to the process and consensus. High (>50) – masculine society that is driven by competition, achievement and success.
Uncertainty Avoidance Index (UAI)	The degree to which the members of a society feel uncomfortable with uncertainty, ambiguity, something away from the status quo.	Low (<50) – society that prefers to maintain time-honored traditions and norms while viewing societal change with suspicion. High (>50) – society that has pragmatic approach: encourages thrift and efforts to prepare for the future.
Long Term Orientation versus Short Term Orientation (LTO)	The degree of a society's preference for either short-term fulfillment of social obligations or long-term orientation to the future, thrift and persistence.	Low (<50) – society that fosters virtues related to the past and present, keeps and honors the traditions. High (>50) – society that views adaptation and circumstantial problem-solving as a necessity.
Indulgence versus Restraint (IND)	The degree to which the members of a society either freely satisfy their basic needs and desires or follow strict social norms.	Low (<50) – society that suppresses and regulates the gratification and has a tendency to cynicism and pessimism. High (>50) – society that possesses a positive attitude and optimism and places a higher degree of importance on leisure time.
Individualism versus Collectivism (IDV)	The degree to which the members of a society are integrated into groups.	Low (<50) – collectivistic society, loyalty and relationships are of high importance. High (>50) – preference for a loosely-knit social framework in which individuals are expected to take care of themselves and their immediate families only.

Source: Own elaboration based on Hofstede and Minkov 2010; Itim International 2017.

Most of researchers, such as Shane (1993), Herbig and Dunphy (1998), Hussler (2004) or Rinne et. al (2012) discovered a negative relationship between Power Distance and innovative performance (Table 2). According to Andrijauskiene and Dumciuvienė (2017), societies willing to increase their national innovation level need to give more emphasis to the distribution of power and demand justification for inequalities so that individuals would feel more motivation to innovate, be recognized and rewarded for these activities.

While analyzing the dimension of Individualism, it can be noted that scientists admitted its' either positive or no effect on innovation. Kaasa and Vadi (2010) found no effect while Shane (1993) posited that the characteristics associated with highly individualistic cultures spur high levels of innovation and invention. Herbig and Dunphy (1998) added that individuals living in such societies have more reasons to expect compensation and recognition for inventive and useful ideas.

Table 2. The relationship between cultural dimensions and innovative performance

Dimension	Effect on innovation	Research
Power Distance	Positive	Kaasa and Vadi 2010
	Negative	Shane 1993, Kaasa 2013, Herbig and Dunphy 1998, Hussler 2004, Rinne et. al. 2012, Andrijauskiene and Dumciuviene 2017
Individualism	Positive	Shane 1993, Williams and McQuire 2005, Herbig and Dunphy 1998, Rinne et. al 2012, Prim et al. 2017, Andrijauskiene and Dumciuviene 2017
	Neutral	Kaasa and Vadi 2010
Masculinity	Negative	Kaasa 2013, Khan and Cox 2017
	Neutral/Not significant	Williams and McQuire 2005, Shane 1993, Andrijauskiene and Dumciuviene 2017
Uncertainty Avoidance	Negative	Kaasa 2013, Shane 1993, Waarts and van Everdingen 2005, Williams and McQuire 2005, Kaasa and Vadi 2010, Herbig and Dunphy 1998, Hussler 2004, Syed and Malik 2014, Andrijauskiene and Dumciuviene 2017
	Neutral	Rinne et. al 2012
Long Term Orientation	Positive	Herbig and Dunphy 1998, Prim et al. 2017
	Neutral/Not significant	Andrijauskiene and Dumciuviene 2017
Indulgence	Positive	Khan and Cox 2017, Prim et al. 2017, Andrijauskiene and Dumciuviene 2017

Source: Own elaboration.

Even earlier than Hofstede proposed his model, Barnett (1953), postulated a positive correlation between the individualism of a society and its innovative potential: the greater the freedom of the individual to explore and express opinions, the greater the likelihood of new ideas coming into being. The latest research by Khan and Cox (2017) also suggests that challenging the status quo (high Individualism) helps the creativity and innovation flourish.

Shane (1993) as well as Williams and McQuire (2005) stated that Masculinity is believed to have no particular effect on economic creativity while Kaasa and Vadi (2010), Kaasa (2013) and Khan and Cox (2017) came up with the results which showed a negative relationship in the matters of innovation performance. According to Nakata and Sivakumar (1996), in feminine societies the focus is on people and a more supportive climate can be found. Information sharing, promotion of collabo-

ration, a warm, non-conflictive climate and socio-emotional support help employees to cope with the uncertainty related to new ideas (Kaasa 2013; Khan and Cox 2017).

Uncertainty avoidance is the fourth cultural dimension, which, as a majority of researchers explained, has a negative effect on innovation performance. Shane (1993), Waarts and van Everdingen (2005) presented arguments to emphasize that cultures with strong uncertainty avoidance can be more resistant to innovations, meanwhile Hussler (2004) introduced a culture-based taxonomy of innovation performance, according to which societies that accept uncertainty are those who attain better innovation level. Finally, a study of Syed and Malik (2014) confirmed that cultures with low uncertainty avoidance tend to adopt new technology more readily than cultures with relatively high uncertainty avoidance.

The dimension of long term orientation, formed in 1991, is generally recognized as

having a positive effect on innovation performance. Herbig's and Dunphy's (1998) findings confirmed that societies characterized as Long-Term Orientated ones have higher innovation capacities. Khan and Cox (2017) also indicated that an encouragement of achievement and long-term thinking (they called it pragmatism) are very important features of innovative nations.

In 1999, Patterson proposed that in countries with a higher value of Indulgence, people have more sense of control over their lives, i.e. they believe that they can have some impact on themselves and their surroundings. Fifteen years later, Syed and Malik (2014) confirmed that indulgent societies may encourage innovation as a way to continually satisfy drives related to having fun and enjoying life. Therefore, Andrijauskiene and Dumciuvienė (2017) concluded that an ensured social security, balance between work and leisure, as well as elimination of stereotypes and strict social norms are measures which could make a huge impact on capabilities to innovate.

In summary, scholars widely proved and accepted that besides research and development activity as an important input, the innovation process is additionally influenced by many other factors, culture to

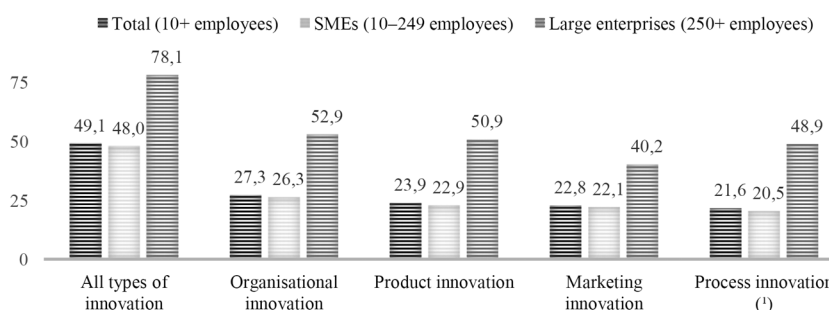
be declared as a very important one. Low power distance and uncertainty avoidance, high individualism and indulgence – these features can be used for a description of a society willing to innovate and possibly succeeding at this activity.

2. Innovative performance in European Union: current situation

The notion of innovation is always based on the aspects of creating value and exploring opportunities with a final and sole firm's objective to form a competitive advantage and gain a bigger market share. Undoubtedly, the success of companies eventually leads to national economic growth and higher employment rate (Kinzel et al. 2005; Laliene and Sakalas 2012).

Almost half of all the enterprises in the EU-28 reported some form of innovation activity (49,1%) during the period 2012-2014. Compared with the period 2010-2012, the share of innovative enterprises remained relatively stable, rising by 0,2 percentage points (Eurostat 2017). Figure 1 shows that EU companies were mostly choosing to implement organizational innovation (27,3%), then product (23,9%), marketing (22,8%) and process (21,6%) innovation.

Figure 1. Share of enterprises that are innovative, EU-28, 2012-2014



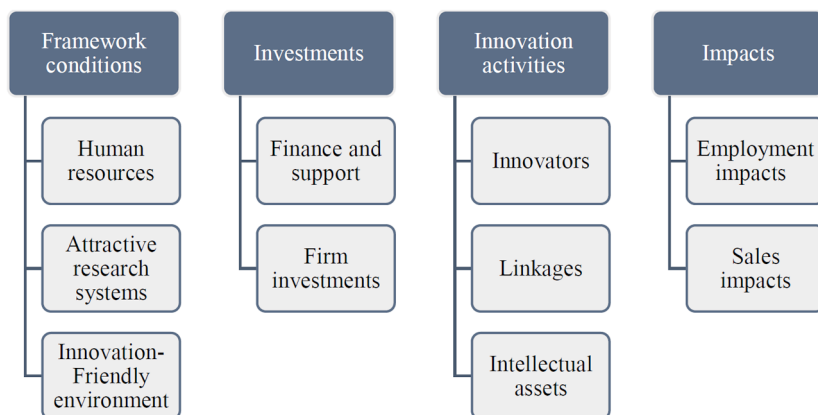
Source: Eurostat 2017 ⁽¹⁾ - excluding Slovenia

According to European Commission's 2017 European Innovation Scoreboard (EIS), while the general innovation performance of the EU is improving, progress is too slow and within the Union, performance gaps still remain wide. Therefore, it may be concluded that companies without strong capabilities to exploit favorable market circumstances, quickly respond to the challenges, manufacture improved or new products, and, above that, implement organizational innovation culture, will be destined to fail.

For the analysis of the latest innovation performance of EU firms, the authors of this paper use data generated while cal-

culating EIS 2017. The new EIS measurement framework distinguishes between four types of indicators and ten innovation dimensions, capturing in total 27 different indicators (Figure 2). The first type of indicators – Framework conditions – capture the main drivers of innovation performance external to the firm. The second one shows public and private investment in research and innovation. Innovation activities, meanwhile, present the innovation efforts at the level of the firm and Impacts, the last type of indicators, cover the effects of the mentioned activities (European Commission, 2017 – EIS 2017).

Figure 2. EIS 2017 measurement framework

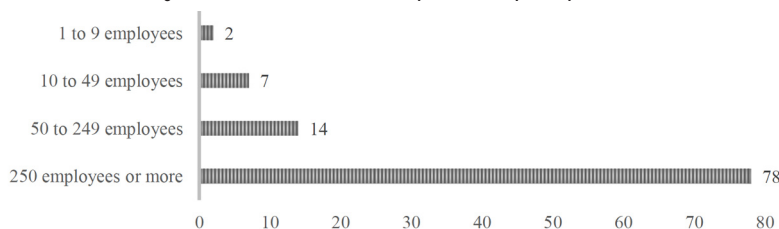


Source: Own elaboration based on European Commission 2017.

As the article focuses on firm's level, only applicable statistics from EIS 2017 is emphasized (authors take relevant parts of dimensions "Firm investments", "Innovators", "Linkages", "Intellectual assets" and "Sales impacts").

2.1. Investments

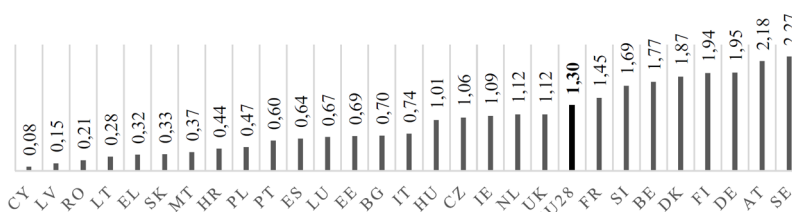
To begin with the relationship between enterprise size and business R&D expenditures, it can be remarked that the bigger the business is, the more money it spends on various experiments, analyzes and related procedures (see the average 2011-2014 data for EU-28 in Figure 3).

Figure 3. Share of business R&D expenditures by enterprise size

Source: Own elaboration based on EIS 2017 database.

Firm investments on R&D and non-R&D innovation as a share of a country GDP are illustrated in Figure 4 and Figure 5. It is clear that the absolute EU leaders in R&D expenditure in the business sector are Swedish and Austrian companies

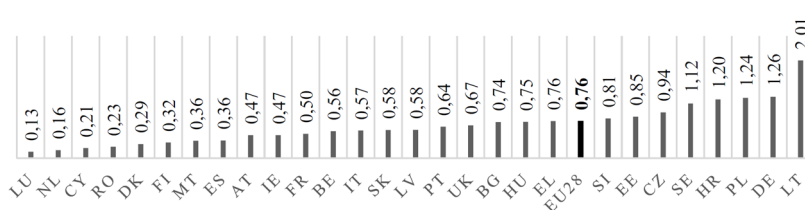
(respectively 2,27% and 2,18% of GDP). Cyprus and Latvia, on the contrary, are at the bottom of the graph with around ten times smaller spending than EU-28 average (1,3%).

Figure 4. R&D expenditure in the business sector (percentage of GDP), 2015

Source: Own elaboration based on EIS 2017 database.

It is necessary to indicate that though Lithuania is almost at the end of the line at the previous graph, this country is on the top with non R&D innovation expenditures (2,01% of turnover – Figure 5). Com-

panies based in Luxembourg (0,13%) and the Netherlands (0,16%) at the same time invested around 7 times less than EU-28 average (0,76%).

Figure 5. Non-R&D innovation expenditures (percentage of turnover), 2015

Source: Own elaboration based on EIS 2017 database.

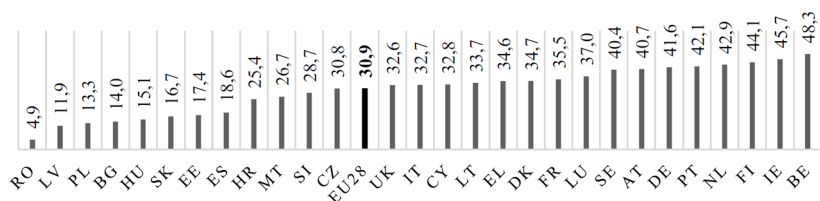
As EIS 2017 report implies, the highest rate of performance increase between 2010 and 2016 is observed in Lithuania (51.3%), followed by Germany (34.0%) and Austria (32.7%). Unfortunately, 12 member states performance decreased, most notably in Cyprus (-87.4%), Romania (-52.5%), Estonia (-38.8%), and Finland (-38.7%).

2.2. Innovative activities

Technological innovation, as measured by the introduction of new products (goods or services) and processes, is a

key ingredient to innovation in manufacturing activities (EC 2017). Therefore, the next analyzed dimension is “Innovators”. Figure 6 shows how many EU small and medium enterprises chose to introduce product and process innovations in 2015. The EU average is 30,9% and the most innovative firms in regards of technological innovations were based in Belgium (48,3%), Ireland (45,7%), and Finland (44,1%) while the least innovative companies could be found in Romania (4,9%).

Figure 6. SMEs introducing product or process innovations (percentage of SMEs), 2015

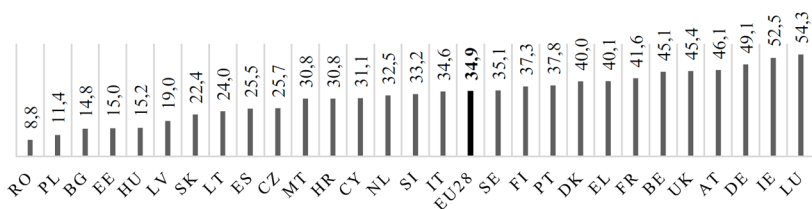


Source: Own elaboration based on EIS 2017 database.

Again, Romanian firms, on average, introduce the smallest number of marketing or organizational innovations (8,8 %, EU

average 34,9% - Figure 7) and this perfectly illustrates one of the examples how big are performance gaps within the Union.

Figure 7. SMEs introducing marketing or organisational innovations (percentage of SMEs)



Source: Own elaboration based on EIS 2017 database.

According to EC (2017), the highest rate of “Innovators” performance increase between 2010 and 2016 is observed in Lithuania (36.4%), followed by the Netherlands (34.0%) and the UK (24.8%). For 19 EU member states, performance decreased, most notably in Estonia (-87.6%), Cyprus

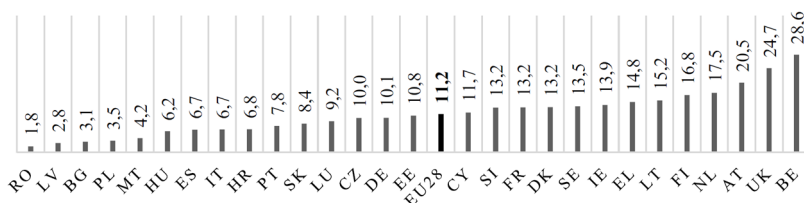
(-49.2%), Germany (-44.6%), and Romania (-38.5%).

Probit estimations based on firm-level data confirm that, next to R&D spending, innovation cooperation is the most important factor in firms' probability to innovate (Jaklič et al. 2014). The next analyzed di-

mension "Linkages" and the indicator "Innovative SMEs collaborating with others" in particular (Figure 8), measures the flow of knowledge between public research institutions and firms, and between firms and other firms. According to EC (2017), this indicator is limited to SMEs, because almost all large firms are involved in inno-

vation co-operation. As the graph shows, on average, only 11,2% of EU companies tend to collaborate with others. The most collaborative ones are Belgian (28,6%), UK (24,7%) and Austrian (20,5%) firms, and the least participative companies are from Romania, Latvia, Bulgaria and Poland (respectively 1,8%; 2,8%; 3,1%; 3,5%).

Figure 8. Innovative SMEs collaborating with others (percentage of SMEs), 2015



Source: Own elaboration based on EIS 2017 database.

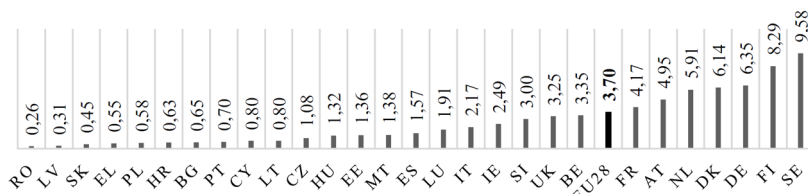
The highest rate of performance increase between 2010 and 2016 was observed in Austria (16.0%), followed by Slovakia (11.3%), and Lithuania (8.7%). For 20 EU member states, performance decreased, most notably in Estonia (-51.3%), Cyprus (-40.9%), Denmark (-37.9%), and Finland (-37.4%) (EC, 2017).

Continuing with the dimension "Intellectual assets", it is important to note that scholars generally agree – patent, trademark and design applications are indicators providing the most comprehensive information on national level of intellectual property.

A patent is an exclusive right to a product or a process that generally provides a

new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application (World Intellectual Property Organization (WIPO), 2018)). Thus, Figure 9 shows that 75% of countries are below EU-28 average (3,70 PCT patent applications per billion GDP (in PPS)). This average is boosted by Sweden (9,58) and Finland (8,29) which have the most applications. 10 countries, including Romania, Latvia, Slovakia, Greece, Poland, Croatia, Bulgaria, Portugal, Cyprus and Lithuania do not even reach 1,00 patent application per billion GDP.

Figure 9. PCT patent applications per billion GDP (in purchasing power standards (PPS)), 2015

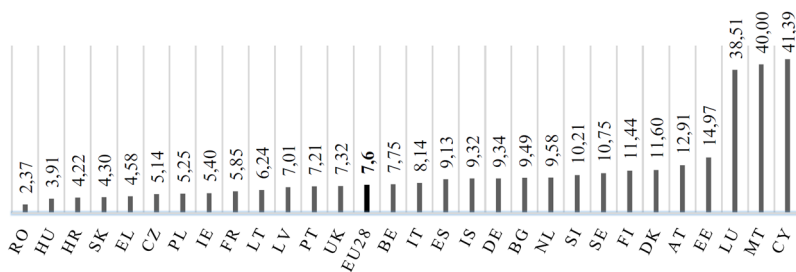


Source: Own elaboration based on EIS 2017 database.

Already mentioned trademarks are as well very important innovation indicator, especially for the service sector. It fulfils the three essential functions: (1) identifies the origin of goods and services, (2) guarantees consistent quality through evidence

of the company's commitment vis-à-vis the consumer, and (3) it is a form of communication, a basis for publicity and advertising (EC 2017). The absolute leaders in this section are Cyprus (41,39), Malta (40,00) and Luxemburg (38,51) (Figure 10).

Figure 10. Trademark applications per billion GDP (in PPS), 2016

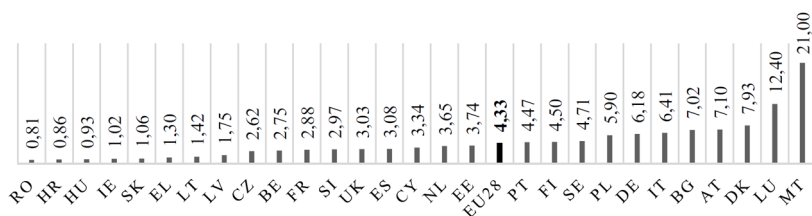


Source: Own elaboration based on EIS 2017 database

The third indicator which describes the dimension "Intellectual assets" is "Design applications per billion GDP (in PPS)". According to EC (2017), a design is the outward appearance of a product (excluding computer programs) or part of it resulting from the lines, contours, colors, shape,

texture, materials and/or its ornamentation. Community design protection is directly enforceable in each Member State. Malta (21,00) and Luxembourg (12,40) are on the top while Romania (0,81), Croatia (0,86) and Hungary (0,93) are at the bottom.

Figure 11. Design applications per billion GDP (in PPS), 2016



Source: Own elaboration based on EIS 2017 database

2.3. Impacts

The last analyzed dimension is "Sales impacts". It measures the competitiveness of the EU and is divided into three indicators: (1) exports of medium and high technology products as a share of total product exports; (2) knowledge-intensive services exports as percentage of total services exports; and (3) sales of new to-market and

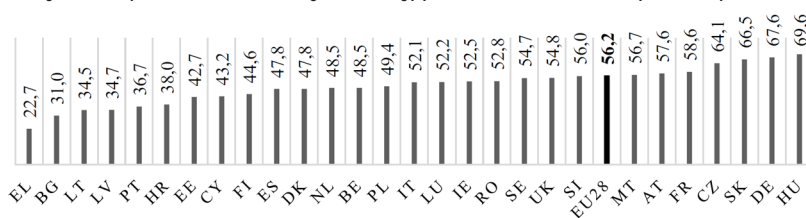
new-to-firm innovations as percentage of turnover.

The first indicator measures the technological competitiveness of the EU, i.e. the ability to commercialize the results of R&D and innovation in international markets (EC 2017). The EU average is 56,2% and Figure 12 illustrates that Hungary (69,6%),

Denmark (67,6%), Slovakia (66,5%) and Czech Republic (64,1%) mostly specialize in medium and high technology produc-

tion which forms more than 60% of overall product exports.

Figure 12. Exports of medium and high technology products as a share of total product exports, 2015

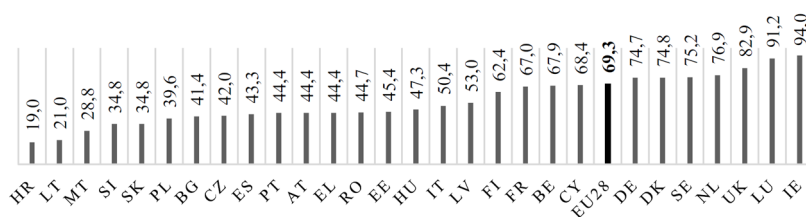


Source: Own elaboration based on EIS 2017 database.

The second indicator measures the competitiveness of the knowledge-intensive services (KIS) sector. It reflects the ability of an economy, notably resulting from innovation, to export services with high levels of value added, and successfully take part in knowledge-intensive global value chains (EC 2017).

Evidently, Figure 13 implies that the most competitive in regards of KIS exports are Ireland (94,0%) and Luxembourg (91,2%), meanwhile in Croatia (19,0%) and Lithuania (21,0%) numbers are more than three times lower than the EU average (69,3%).

Figure 13. Knowledge-intensive services exports as percentage of total services exports, 2015

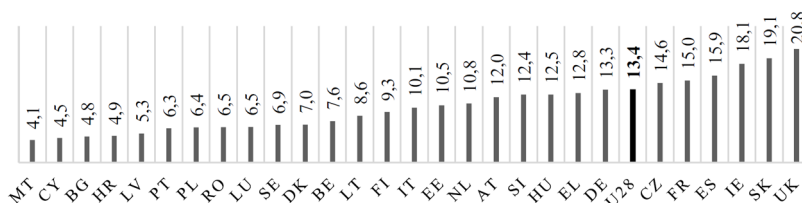


Source: Own elaboration based on EIS 2017 database.

The last indicator which belongs to the dimension "Sales impacts" (Figure 14) measures the turnover of new or significantly improved products and includes

both products which are only new to the firm and products which are also new to the market (EC 2017).

Figure 14. Sales of new to-market and new-to-firm innovations as percentage of turnover, 2015



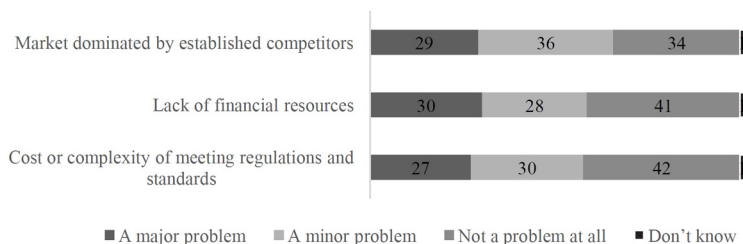
Source: Own elaboration based on EIS 2017 database

It is important to note that EU-28 average is quite low (13,4%) and even the leaders' innovation sales make up less than 1/5 of the whole turnover (UK (20,8%), Slovakia (19,1%) and Ireland (18,1%). At least several reasons why companies struggle with the commercialization of innovative goods and services are presented in Innobarometer 2016.

Innobarometer 2016 is a survey that was carried out by TNS Political & Social network in the 28 member states of the European Union, Switzerland and the United States between the 1st and 19th Febru-

ary, 2016. There were 14,117 companies interviewed, of which 13,117 were from the 28 EU Member states, and 500 each from Switzerland and the United States (EC 2016). The results show that as a major or minor problem, 65% of respondents see competitors' market domination, 58% claim that they struggle with a lack of financial resources and 57% named cost or complexity of meeting regulations and standards as an obstacle which interfere with a successful commercialization of innovative goods and services.

Figure 15. Problems of commercializing company's innovative goods and services, 2016



Source: Own elaboration based on Innobarometer 2016 (EC 2016).

The analysis of innovation performance of EU companies showed that half of the Union enterprises are innovative and most of them create organizational innovations. Though next to R&D spending innovation cooperation is the most important factor in firms' probability to innovate, only 11,2% of SMEs collaborate with public research institutions or other firms. Talking about intellectual property, Sweden (9,58) and Finland (8,29) have the most PCT patent application per billion GDP (in PPS), meanwhile Cyprus (41,39) is the leader in trademark applications and Malta with Luxembourg have the biggest number of both trademark and design applications (respectively 40,00; 21,00 and 38,51; 12,40 per billion GDP). Finally, evaluation of sales impacts illustrates that companies in Eu-

ropean Union still struggle with the ability to commercialize new or significantly improved products – innovation sales make up only 13,4% of the total turnover and this situation is mostly influenced by competitors which dominate the market.

As it was already indicated above, general innovation performance of the EU is improving, yet progress is too slow and within the Union, performance gaps still remain wide. Therefore, researchers in economics, business strategy, marketing and management, and public policy are all focusing on various aspects of innovation, and are concerned about understanding the factors that determine firms' innovativeness (Kolluru and Mukhopadhaya 2017). Today, the focus is on factors related to people and behavior, emphasizing the role of cul-

ture, as a factor that can both stimulate or restrain innovation, and therefore affect company's performance (Naranjo-Valencia et al. 2016). Due to a growing interest in the relationship between culture and innovation, the authors of this article decided to analyze the importance of culture as a determinant of firm's innovation performance.

3. Culture in European Union: are we so different?

The members of European Union are quite close from the geographical point of view but their cultural norms and values can be surprisingly different. These differences, as it was mentioned before, can influence the innovative capacity of countries. Thus, by using scores on the Hofstede's dimensions, this paragraph is dedicated to an overview of European citizens' cultural features (reminder: if a score is under 50, the culture scores relatively low on that scale and if a score is over 50, the culture scores high).

To begin with, as it can be seen in Figure 16, Austria and Denmark have the lowest scores on Power Distance. Individuals living in these countries demonstrate independence and a strong seek for equal rights. Other 11 countries, starting from Ireland up to Hungary, also have a relatively small score which represents the encouragement of democratic forms of participation, trust between different hierarchical levels, direct and participative communication. All other states and especially Slovakia and Romania share quite different features of national cultures. Relatively, people there tend to accept centralized decision structures, unequal distribution of power, extensive use of formal rules and paternalistic power relations.

While analyzing the dimension of Masculinity versus Femininity, it can be stated

that Sweden, Latvia, the Netherlands, Denmark, Lithuania and Slovenia have the most feminine societies in the European Union (Figure 17). All individuals living in the mentioned countries are supposed to be modest, tender, and concerned with the quality of life, conflicts there are solved through negotiation and consensus rather than force. Highly masculine countries like Italy, Austria, Hungary or Slovakia, on the contrary, share the dominant values such as clearly distinct gender roles, competitiveness and a great emphasis on material success and economic growth.

Figure 16. Power Distance

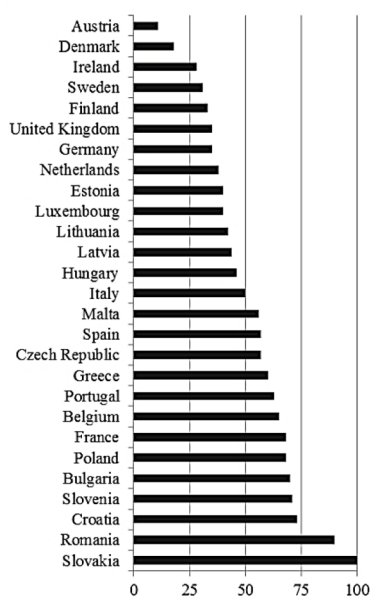


Figure 17. Masculinity

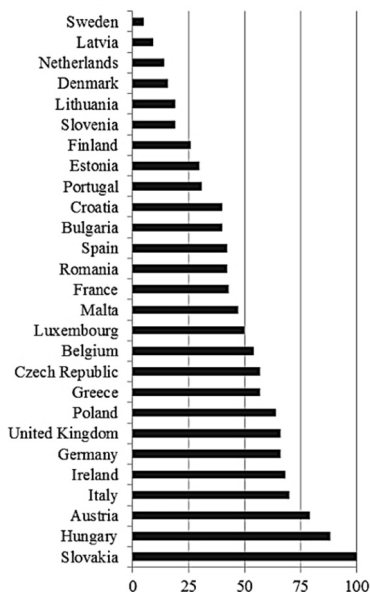
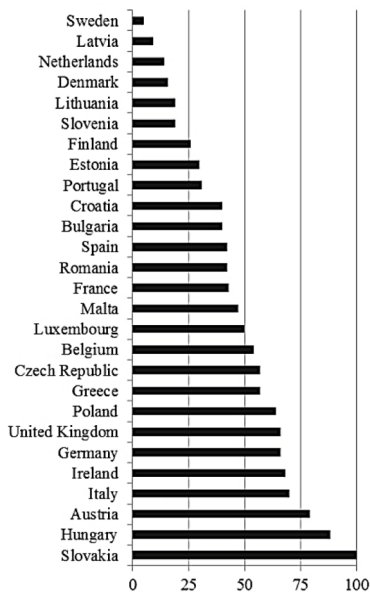


Figure 18. Uncertainty Avoidance



Source: Own elaboration based on Itim International 2017.

Figure 18 represents the level of uncertainty avoidance. The comparison shows

that in the cultures of Denmark, Sweden, Ireland and United Kingdom unpredictable future situations are welcomed with curiosity rather than stress. The rest of member states try to reduce the risks to the minimum by strict behavioral codes, laws. According to Hofstede (2011), high score in uncertainty avoidance also means higher stress, emotionality, anxiety, neuroticism and poorer self-control.

The fourth dimension is Long Term versus Short Term Orientation. As explained by Hofstede (2011), it is related to the choice of focus for people's efforts: the future or the present and past. Ireland and Portugal hold the lowest scores (Figure 19) and have cultures classified as normative where individuals respect the traditions but also have an immediate need for spending, consumption and focus on achieving quick results. Contrarily, people living in long term oriented cultures like Estonia, Lithuania, Belgium and Germany can be characterized as persistent individuals who believe that most important events in life will occur in the future and whose values are learning, adaptiveness, accountability and self-discipline.

Figure 20 illustrates the level of individualism and collectivism in the countries. It can be seen that the United Kingdom has the most individualistic society which appreciates privacy, prevails tasks over relationships and seeks for unique personal contribution to the community. Quite the opposite, countries, such as Portugal, Slovenia, Bulgaria, Romania, Croatia and Greece have the consciousness of "we" rather than "I". Group goals and cooperating with others is a norm, an individual is of value only insofar as he serves the group.

The sixth dimension Indulgence versus Restraint is complementary to Long term versus Short-Term Orientation and is mainly related to national levels of subjective

happiness and life control (Hofstede 2011). The data presented in Figure 21 show that societies such as Latvia, Bulgaria, Estonia, Lithuania and Romania are extremely re-straint. People in general feel less happy and less healthy, they have stricter moral discipline and more introverted personalities if compared to other EU member states. In contrast to the mentioned countries, it can be noted that individuals living in Greece, Luxembourg, Finland, Belgium, Austria, Ireland, Malta, the Netherlands, United Kingdom, Denmark and Sweden (Sweden being on the top) tend to put much more emphasis on their leisure time, individual happiness and well-being.

Figure 19. Long term orientation

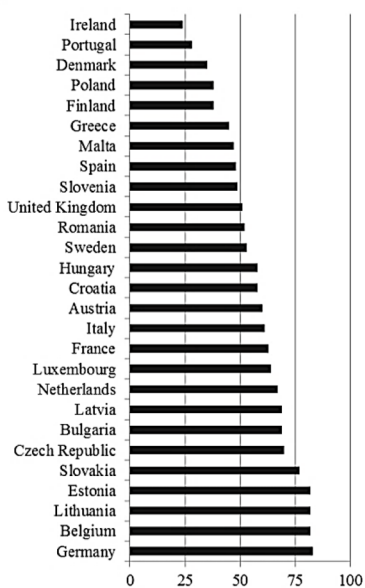


Figure 20. Individualism

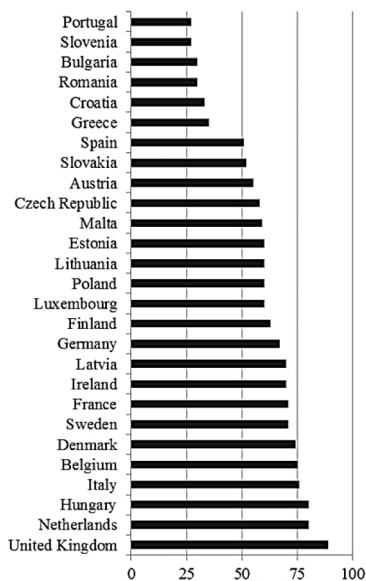
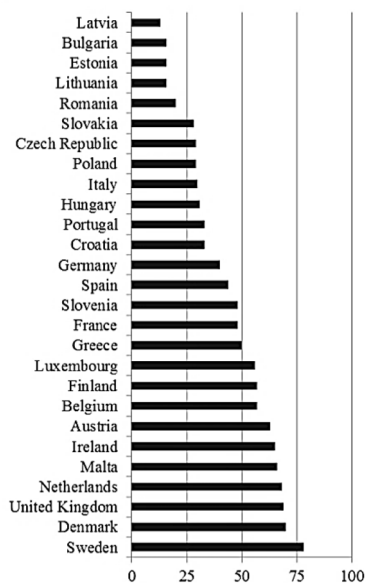


Figure 21. Indulgence



Source: Own elaboration based on Itim International 2017.

It is clear that 28 EU member states are very diverse in terms of norms, beliefs, values and behaviors. Naturally, these differences can at least partially explain a heterogeneity of innovation variables within the Union.

4. Culture as a determinant of successful firms' innovative performance: empirical evidence

4.1. Methodology

For the detailed analysis, the following indicators were used:

1. Indicators showing the features of a firm, i.e. size of an organization (<10 employees; 11- 49 employees; 50-249 employees; >250 employees), sector (private; public), whether or not the organization is engaged with innovation activities (yes; no);
2. Indicators revealing the representative's opinion on the importance of several groups of determinants. Firstly, they were asked to prioritize the importance of determinants' degree (level): World (e.g. global achievements in products or processes), Country (e.g. national level of information and communication technologies), Company (e.g. talent programs, conditions to combine work and leisure), and Individual (e.g. the lifestyle, education or values of an employee). Secondly, the representatives were asked to prioritize the importance of determinants' type: Political (e.g. national innovation policy; subsidies for innovative companies), Economic/financial (e.g. expenditures on R&D; average wage), Social-Cultural (e.g. social equality, norms, beliefs and values of employees and consumers), Technological

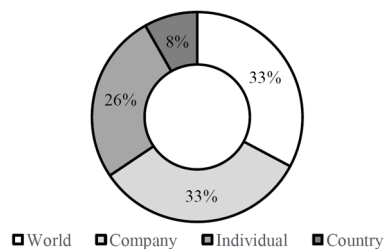
(e.g. innovative products or services offered by competitors, national level of ICT), Ecological (e.g. company's environmental impact, the public's attitude to global warming or renewable energy), Legal (e.g. laws regulating protection of intellectual property).

Totally 150 representatives from small, medium and large companies were surveyed, response rate – 40,6% (61 representatives). For the interpretation of the research results, correlation coefficients were calculated (regression analysis could not be applied because all variables are qualitative).

4.2. Research results and discussion

66% of respondents believe that two the most important levels (degrees) of determinants which make the biggest influence on firms' innovation performance are world's and company's level (Figure 22). 26% of those who answered to the survey questions state that the most influencing determinants are at the level of an individual and only 8% note that such aspects as national ICT level or laws regulating protection of intellectual property (country level) are the most significant during the process of creating new or improved goods and services.

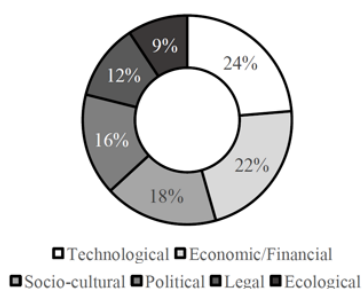
Figure 22. Which level of determinants makes the biggest impact on firms' innovation performance?



Source: Own elaboration.

When respondents had to choose which type of determinants makes the biggest impact on firms' innovation performance, 24% of priority scores were given to technological ones (e.g. level of global achievements in products or processes). The second most prioritized type of determinants (22%) were economic/financial ones (e.g. company's R&D expenditures). In the third place, with 18% of priority scores, were socio-cultural determining factors, such as consumers' lifestyle or employees' willingness to work in a team/individually. Political determinants (e.g. national education policy) were in the fourth place (16%), legal type of determinants (e.g. laws regulating IP) – in the fifth place (12%) and the least important ones, according to the respondents, were ecological determining factors (9%).

Figure 23. Which type of determinants makes the biggest impact on firms' innovation performance?



Source: Own elaboration.

The initial results show that it is not enough to increase the amount of money spent on R&D and according to the representatives of firms, it is also important to offer favorable conditions for employees so that they would feel more motivated to engage in innovative activities. As it was mentioned before, balance between job commitments, family and leisure, elimination of stereotypes and strict social norms, good atmosphere and psychological climate at the work place can ensure enthusiasm and inspiration for new solutions, methods or products.

Correlation analysis was performed in order to find the association between the variables. Due to the fact that there was no significant relationship between the size of a company/engagement in the innovative activities and the choice of the most important level/type of determinants of innovation performance, only noteworthy results are presented in Table 3 and Table 4.

First of all, by using Spearman correlation method, it was found out that those representatives who were stating that the most important type of determinants which influence firms' innovation performance are socio-cultural, tended to give less points for legal ($r=-,432$), technological ($r=-,326$) and economic ($r=-,317$) determinants.

Table 3. Correlation analysis (by type of determinants)

		Social-cultural	Legal	Ecological	Technological	Political	Economic
Social-cultural	Correlation Coef.	1,000	-,432**	-,117	-,326*	-,204	-,317*
	Sig. (2-tailed)	.	,001	,371	,010	,115	,013
Legal	Correlation Coef.	-,432**	1,000	-,407**	-,113	,050	,252*
	Sig. (2-tailed)	,001	.	,001	,386	,699	,050
Ecological	Correlation Coef.	-,117	-,407**	1,000	,075	-,208	-,263*
	Sig. (2-tailed)	,371	,001	.	,566	,108	,040
Technological	Correlation Coef.	-,326*	-,113	,075	1,000	-,339**	-,167
	Sig. (2-tailed)	,010	,386	,566	.	,008	,198

Political	Correlation Coef.	-,204	,050	-,208	-,339**	1,000	-,220
	Sig. (2-tailed)	,115	,699	,108	,008	.	,089
Economic	Correlation Coef.	-,317*	,252*	-,263*	-,167	-,220	1,000
	Sig. (2-tailed)	,013	,050	,040	,198	,089	.

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

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

Source: Own elaboration.

Table 4 illustrates that respondents belonging to private sector organizations tended to choose technological determinants as the most important for successful

firms' innovation performance while those from public sector stated that political circumstances make the biggest influence on their organization innovative activities.

Table 4. Correlation analysis (sector/type of determinants)

		Technological	Political	Economic	Sector
Technological	Correlation Coef.	1,000	-,339**	-,167	,364**
	Sig. (2-tailed)	.	,008	,198	,004
Political	Correlation Coef.	-,339**	1,000	-,220	-,374**
	Sig. (2-tailed)	,008	.	,089	,003
Sector	Correlation Coef.	,364**	-,374**	,044	1,000
	Sig. (2-tailed)	,004	,003	,735	.

Source: Own elaboration.

To sum up, it is evident that opinions of scholars and practitioners are not so distinct. According to the representatives of companies, socio-cultural determinants of innovation performance are relevant: less important than technological and economic determinants but more important than political, legal and ecological ones.

Conclusions

Scholars agree that besides research and development activity as an important input, the innovation process is additionally influenced by many other factors, culture to be declared as a very important one. The role of culture, as a factor, can both stimulate or restrain innovation, and therefore affect company's performance.

The most recognized and cited study about identification and measurement of the dimensions of culture has been pro-

vided by the Dutch researcher Geert Hofstede. The analysis of the relationship between culture and innovation suggests that societies having a potential to innovate has the following features: highly individualistic culture (high individualism), willingness to demand justification for inequalities of power (low power distance), feeling comfortable with uncertainty and risks (low uncertainty avoidance), freely satisfying basic needs and desires by placing a higher degree of importance on leisure time (high indulgence).

The evaluation of innovation performance of EU companies showed that half of the Union enterprises are innovative and most of them initiate organizational innovations. Nevertheless, there are several problems. Firstly, only 11,2% of SMEs collaborate with public research institutions or other firms. Secondly, companies still

struggle with the ability to commercialize new or significantly improved products – innovation sales make up only 13,4% of the total turnover. Lastly, there are big performance gaps, especially at R&D and non-R&D innovation expenditures, PCT patent applications, design applications and trademark applications.

According to the representatives of companies, socio-cultural determinants of innovation performance are relevant. Though they are less important than technological and economic determinants but affirmed to be more significant than political, legal and ecological ones. Therefore, it is offerable to create favorable conditions for employees so that they would feel more motivated to engage in innovative activities – balance between job commitments, family and leisure, elimination of stereotypes and strict social norms, positive psychological climate at the workplace can ensure enthusiasm and inspiration for new products, services and processes.

Hardly any studies which measure the impact on firm's innovation performance take into account all six cultural dimensions because the last one - Indulgence versus Restraint – was introduced only several years ago. Therefore, this study fills in the important research gap and the gathered results can help organizations in creating effective strategies for the improvement of their capabilities to innovate.

It is worth to note that the analysis was mainly limited by the structure of survey questions and a small number of respondents. For the future research, it would be highly useful to consider business area of the companies, also, to include quantitative variables, such as key performance indicators, and to observe firm's performance in a longer period of time so that the conclusions would be better justified.

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are mainly related to EU development, project management, innovation and socio-economic impact of EU funds.

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