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HOFSTEDE'S CULTURAL DIMENSIONS AND NATIONAL INNOVATION LEVEL

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Abstract

Nowadays, the vast majority of scholars admit that innovation in many countries is a key to a fast economic development which enables a high level productivity and quality of life. As European Innovation Scoreboard 2016 states, "Innovation grows the EU's knowledge economy, it enhances our competitiveness and it creates a prosperous future for all Member States". Nevertheless, though the European Union is constantly seeking convergence, the members are still divided to modest, moderate, strong innovators and innovation leaders. Therefore, it is crucial to constantly analyse all drivers and determinants of successful national-level innovation performance. The authors of this article suggest that culture is one of the influencing factors because EU countries differ significantly by their social norms, morals, values, traditions and behaviors which may also affect the innovative capacity of a society. Thus, the purpose of this study is to explore the link between nation's cultural background and country – level innovation performance. Systemic review of scientific economic literature, comparative judgement and regression analysis were used in order to reach the conclusions. The data from European Innovation Scoreboard and scores of six Hofstede's cultural dimensions were applied in the empirical analysis. The representative results show that the dimensions of indulgence and individualism are positively while power distance and uncertainty avoidance are negatively related to national innovation performance.

Keywords: EU, innovation, Hofstede's dimensions

1. INTRODUCTION

"Countries may not be able to increase their rates of innovation simply by increasing the amount of money spent on research and development or industrial infrastructure. They also may need to change the values of their citizens to those that encourage innovative activity" (Shane, 1993).

Researchers suggest a significant relationship between a nation's culture and its level of innovativeness (Barnett, 1953; Shane, 1992; Patterson, 1999; Hayton and Zahra, 2002; Hussler, 2004; Didero, Gareis, Marques, Ratzke, 2008; Lundvall, 2009; Kaasa and Vadi, 2010; Ofori-Dankwa, 2013; Kaasa, 2013; Khan, Cox, 2017).

In order to prove the mentioned relationship, different instruments and data were used. Self-employment rates, royalty and license fees, trademarks, technology adoption rates, patents, R&D expenditures and even a number of research centers were adopted as variables of innovation (Khan, Cox, 2017). For the cultural part, scientists were choosing between Values Orientation Theory (Kluckhohn and Strodtbeck, 1961), Trompenaars and Hampden-Turner (Trompenaars and Hampden-Turner, 2004), GLOBE (House, Hanges, Javidan, Dorfman, Gupta, 2004), European Social Survey (Kaasa, 2009) and Hofstede's Cultural Dimensions Theory (Jones and Teegan, 2001; Rinne, Steel, Fairweather, 2012; Syed, Malik, 2014; Prim, Filho, Zamur, Di Serio, 2017).

Despite the fact that the topic has been widely analyzed, it is still relevant because the results provided by researchers differ significantly. For a detailed analysis, the authors used data from European Innovation Scoreboard 2016 and the scores of Hofstede's Cultural Dimensions. It is important to note that the last dimension of Indulgence versus Restraint was presented only several years ago, therefore, hardly any studies which measure the impact on national innovation performance take into account all six cultural dimensions. The authors of this research seek to assess whether innovation performance in Europe is culture-specific by filling in this gap.

This article is started with a literature review, followed by a presentation of European Innovation Scoreboard and six Hofstede's dimensions. Thereafter, similarities and differences of EU Member States are demonstrated and statistical analysis is used to examine the relationship between culture and innovation.

2. 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 (Steenkamp, 2001; Brons, 2006; Javidan, House, Dorfman, Hanges, De Luque, 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, Hartog, Mitchelson, 2003). As for now, six dimensions of culture are proposed - Power Distance, Individualism

versus Collectivism, Masculinity versus Femininity, Uncertainty Avoidance, Long Term versus Short Term Orientation and Indulgence versus Restraint (for more comprehensive information, see paragraph 2.1.).

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 (see Table 1). According to Kaasa (2013), low power distance cultures, which emphasize subordinates' autonomy in decision making, promote innovation, entrepreneurship and inventions. On the contrary, societies with high power distance cultures tend to discourage innovation and creativity.

While analyzing the dimension of Individualism, it can be noted that scientists admitted its' either positive or no effect on innovation. Kaasa, Vadi (2010), Ali, J. Ali, I. (2012) found no effect while Shane (1993) posited that the characteristics associated with highly individualistic cultures spur high levels of innovation and invention. Herbig, Dunphy (1998) added that individuals living in such societies have more reasons to expect compensation and recognition for inventive and useful ideas.

Table 1

The relationship between cultural dimensions and innovative performance

Dimension	Effect on innovation	Research
Power Distance	Positive	Kaasa, Vadi (2010)
	Negative	Shane (1993), Kaasa (2013), Herbig, Dunphy (1998), Hussler (2004), Rinne, et. al. (2012), Ali, J., Ali, I. (2012)
Individualism	Positive	Shane (1993), Williams, McQuire (2005), Herbig, Dunphy (1998), Rinne, et. al (2012), Prim, Filho, Zamur, Di Serio (2017)
	Neutral	Kaasa, Vadi (2010), Ali, J., Ali, I. (2012)
Masculinity	Negative	Kaasa (2013), Khan, Cox (2017).
	Neutral	Williams, McQuire (2005), Shane (1993), Ali, J., Ali, I. (2012)
Uncertainty Avoidance	Negative	Kaasa (2013), Shane (1993), Waarts, van Everdingen (2005), Williams, McQuire (2005), Kaasa, Vadi (2010), Herbig, Dunphy (1998), Hussler (2004), Ali, J., Ali, I. (2012), Syed, Malik (2014)
	Neutral	Rinne, et. al (2012)
Long Term Orientation	Positive	Herbig, Dunphy (1998), Prim, Filho, Zamur, Di Serio (2017)
	Neutral	Ali, J., Ali, I. (2012)
Indulgence	Positive	Khan, Cox (2017), Prim, Filho, Zamur, Di Serio (2017)

Source: authors' own contribution

Even earlier than G. Hofstede has 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, Cox (2017) also suggests that challenging the status quo (high Individualism) helps the creativity and innovation flourish.

Shane (1993), Williams, McQuire (2005), Ali, J. Ali, I. (2012) stated that Masculinity is believed to have no particular effect on economic creativity while Kaasa, Vadi (2010), Kaasa (2013), Khan, Cox (2017) came up with the results which showed a negative relationship in the matters of innovation performance. According to Nakata, Sivakumar (1996), in feminine societies the focus is on people and a more supportive climate can be found. Sharing of information, the promotion of collaboration, a warm, non-conflictive climate and socio-emotional support help employees to cope with the uncertainty related to new ideas (Kaasa, 2013; Khan, 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, 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 which accept uncertainty are those who attain better innovation level. Finally, a study Syed, 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, 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, Malik (2014) confirmed that indulgent societies may encourage innovation as a way to continually satisfy drives related to having fun and enjoying life. Therefore, Khan, Cox (2017) concluded that indulgent cultures tend to create new technology as a way to improve life.

All in all, the results of previous research prove that the final innovation performance may develop on the basis of a combined effect of cultural dimensions. As it was mentioned before, there are only several studies which use all 6 Hofstede's cultural dimensions. Hence, it is of great importance to fill in this research gap and explore types of cultures which are more innovative than others. In the following paragraphs, the analysis is done in the context of European Union.

3. CULTURE AND INNOVATION IN EU: CURRENT SITUATION

3.1. Hofstede's cultural dimensions

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 (1991) 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 relative positions on the dimensions (see Table below) are expressed in a score on a 0-100 point scale. If a score is under 50, the culture scores relatively low on that scale and if any score is over 50, the culture scores high.

Table 2

Hofstede's cultural dimensions

Dimension	Short description	Score
Power Distance Index (PDI)	The degree to which the less powerful members of a society accept and expect that power is distributed unequally.	Low – society strives to equalize the distribution of power and demand justification for inequalities of power. High – 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 – feminine society that is oriented to the process and consensus. High – 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 – society that prefers to maintain time-honored traditions and norms while viewing societal change with suspicion. High – 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 – society that fosters virtues related to the past and present, keeps and honors the traditions. High – 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 – society that suppresses and regulates the gratification and has a tendency to cynicism and pessimism. High – 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 – collectivistic society, loyalty and relationships are of high importance. High - preference for a loosely-knit social framework in which individuals are expected to take care of themselves and their immediate families only.

Source: authors'based on Hofstede, Hofstede, Minkov (2010), Itim International (2017), https://geert-hofstede.com, [accessed 05.03. 2017]

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, Maseland, Hoorn, 2015). Hence, on the basis of 6 Hofstede's dimensions, next paragraph is devoted for the analysis of EU Member States'cultural features.

3.2. Culture in EU: current situation

Austria and Denmark have the lowest scores on Power Distance Index (see Figure 1). 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 (see Figure 2). 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.

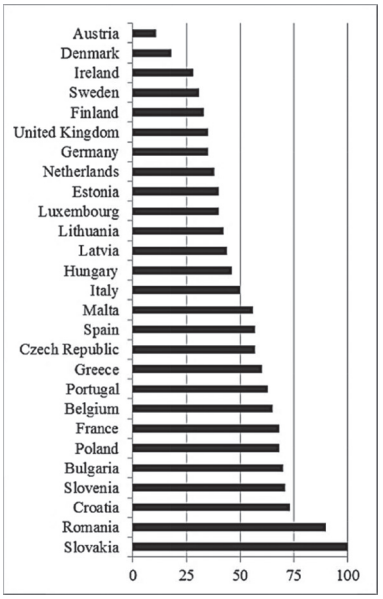


Figure 1 Power Distance

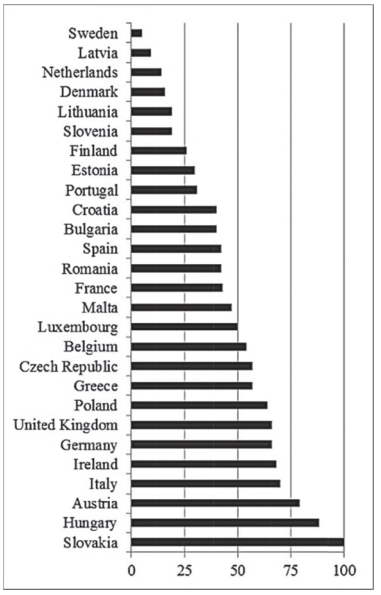


Figure 2 Masculinity versus Femininity

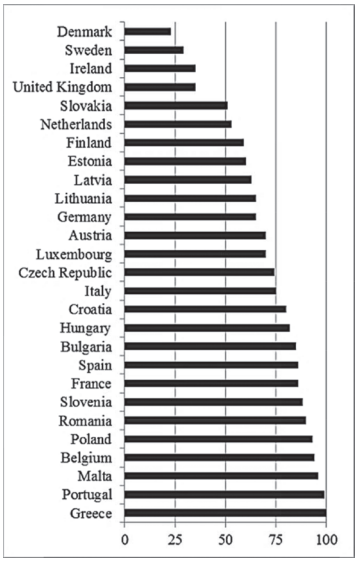


Figure 3 Uncertainty Avoidance

Source: authors' based on Itim International (2017), https://geert-hofstede.com, [accessed 05.03.2017]

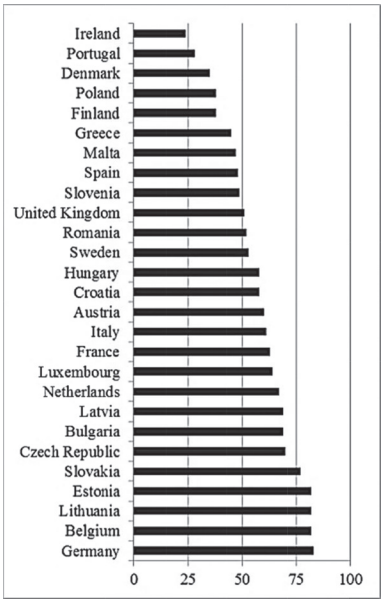
Figure 3 represents the level of uncertainty avoidance. The comparison shows that in the cultures of Denmark, Sweden, Ireland and United Kingdom unpredictable future situations are welcomed with curiosity rather than stress. The rest of Member States try to reduce the risks to the minimum by strict behavioral 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 (see Figure 4) 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 5 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 in Figure 6 shows that societies of Latvia, Bulgaria, Estonia, Lithuania and Romania are extremely restraint. 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.



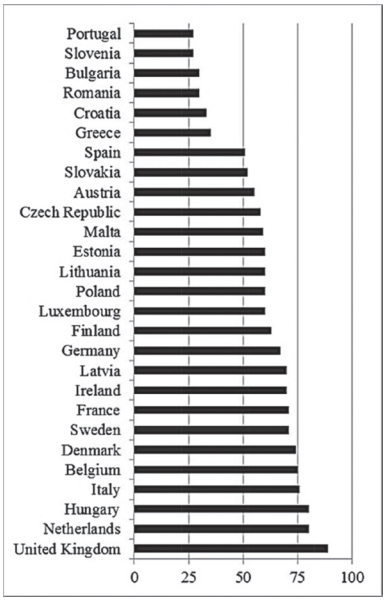


Figure 4 Long term orientation Figure 5 Individualism versus Collectivism

Figure 6 Indulgence versus Restraint

Source: authors' based on Itim International (2017), https://geert-hofstede.com, [accessed 05.03.2017]

To sum up, though the members of European Union are quite close from the geographical point of view, their cultural norms and values can be surprisingly different. Therefore, it is necessary to analyze whether these differences can influence the innovative capacity of the countries. Results are presented in the paragraph 4.

3.3. European innovation scoreboard

The European Innovation Scoreboard (EIS) – previously Innovation Union Scoreboard – provides a comparative analysis of innovation performance in EU Member States, other European countries, and regional neighbors (European Commission, 2016). It was introduced as a part of the Lisbon strategy and evaluates, on a yearly basis, relative strengths and weaknesses of national innovation systems. For now, EIS consists of three main types of indicators and eight innovation dimensions, capturing in total 25 different indicators (see Table 3). Enablers show the main drivers of innovation that are external to the firm, firm activities capture innovation efforts at the firm level and outputs capture the outputs of firm activities.

Table 3

The structure of European Innovation Scoreboard

Main type	Innovation dimension	Indicator
Enablers	Human resources	1.1.1 New doctorate graduates per 1000 population aged 25-34 1.1.2 Percentage population aged 30-34 having completed tertiary education 1.1.3 Percentage youth aged 20-24 having attained at least upper secondary level education
	Open, excellent and attractive research systems	1.2.1 International scientific co-publications per million population 1.2.2 Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country 1.2.3 Non-EU doctorate students as percentage of all doctorate students
	Finance and support	1.3.1 R&D expenditure in the public sector as percentage of GDP 1.3.2 Venture capital investment as percentage of GDP
Firm activities	Firm investments	2.1.1 R&D expenditure in the business sector as percentage of GDP 2.1.2 Non-R&D innovation expenditures as percentage of turnover
	Linkages & entrepreneurship	2.2.1 SMEs innovating in-house as percentage of SMEs 2.2.2 Innovative SMEs collaborating with others as percentage of SMEs 2.2.3 Public-private co-publications per million population
	Intellectual assets	2.3.1 PCT patents applications per billion GDP 2.3.2 PCT patent applications in societal challenges (environment-related technologies; health) per billion GDP 2.3.3 Community trademarks per billion GDP 2.3.4 Community designs per billion GDP

Outputs	Innovators	3.1.1 SMEs introducing product or process innovations as percentage of SMEs 3.1.2 SMEs introducing marketing or organisational innovations as percentage of SMEs 3.1.3 Employment in fast-growing enterprises (average innovativeness scores)
	Economic effects	3.2.1 Employment in knowledge-intensive activities (manufacturing and services) as percentage of total employment 3.2.2 Medium and high technology product exports as percentage of total product exports 3.2.3 Knowledge-intensive services exports as percentage of total service exports 3.2.4 Sales of new-to-market and new-to-firm innovations as percentage of turnover 3.2.5 License and patent revenues from abroad as percentage of GDP

Source: European Commission (2016). European Innovation Scoreboard 2016 http://ec.europa.eu/DocsRoom/documents/17821 [accessed 20.02.2017]

Based on the calculated average innovation performance, Member States fall into four different categories: Innovation Leaders with innovation performance well above the EU average, Strong Innovators with innovation performance above or close to the average, Moderate Innovators with the performance below the average and Modest Innovators which are well below the average.

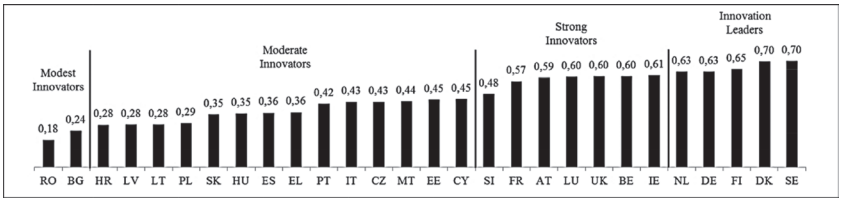


Figure 7 Innovation performance in EU Member States

Source: authors' based on European Commission (2016)

As it can be seen in the figure above, Romania and Bulgaria currently are at the bottom of performance scale. 14 States – Croatia, Latvia, Lithuania, Poland, Slovakia, Hungary, Spain, Portugal, Italy, Czech Republic, Malta, Estonia and Cyprus belong to Moderate Innovators. Countries, which appear to be Strong Innovators, are Slovenia, France, Austria, Luxembourg, United Kingdom, Belgium and Ireland. Finally, the top innovators in EU are the Netherlands, Germany, Finland, Denmark and Sweden.

Hence, it is clear that regarding innovation performance, there is a lack of homogeneity within European Union. Next paragraph is dedicated for the analysis of the possible reasons of this imbalanced situation.

4. RESEARCH METHODOLOGY

Data selection. For the detailed analysis of the relationship between country's innovation performance and the cultural features of citizens, a few types of indicators were engaged:

1. Indicator showing the level of country's innovativeness, i.e. Summary Innovation Index (**SII**). The score ranges from a minimum value of 0 to a maximum value of 1;

2. Indicators revealing the cultural features of a country, i.e. 6 Hofstede's cultural dimensions – Power Distance Index (**PDI**), Individualism versus Collectivism (**IDV**), Masculinity versus Femininity (**MAS**), Uncertainty Avoidance Index (**UAI**), Long Term Orientation versus Short Term Orientation (**LTO**) and Indulgence versus Restraint (**IND**). The scores range from a minimum value of 0 to a maximum value of 100.

The indicators were obtained from the European Innovation Scoreboard 2016 (European Commission, 2016) and Hofstede's center (Itim International, 2017).

Research methods. For the interpretation of the research results, correlation coefficients were calculated and regression analysis was applied. Presence or absence of the relationship between the selected indicators was established using Pearson's correlation method, followed by a multiple linear regression.

Sample. 27 Member States of the EU (except Cyprus, for which no Hofstede dimensional scores were available).

5. RESULTS AND DISCUSSION

Firstly, it was checked whether all data is normally distributed. The variable "Individualism versus Collectivism" did not have a normal distribution. Therefore, logarithmic, and, later on, second power transformation was applied.

A correlation analysis of Summary Innovation Index and 6 Hofstede's cultural dimensions was conducted and the results are presented in Table 4. Power Distance, Masculinity, Uncertainty Avoidance and Long Term Orientation all appeared to be negatively related to innovation scores (respectively r=-.645; r=-.129; r=-.562; r=-.130). The rest of dimensions - Individualism and Indulgence correlated positively (r=.828; r=.524).

Table 4

Correlations between the innovation indicator and cultural dimensions

	SII	PDI	MAS	UAI	LTO	IND	IDV
Summary Innovation Index	1	-.645**	-.129	-.562**	-.130	.828**	.524**
		.000	.529	.003	.528	.000	.006
Power Distance Index	-.645**	1	.207	.581**	.133	-.499**	-.516**
	.000		.310	.002	.518	.009	.007
Masculinity versus Femininity	-.129	.207	1	.160	.081	-.078	.090
	.529	.310		.435	.695	.705	.663
Uncertainty Avoidance Index	-.562**	.581**	.160	1	.032	-.400*	-.557**
	.003	.002	.435		.877	.043	.003
Long Term Orient. vs Short Term Orientation	-.130	.133	.081	.032	1	-.408*	.140
	.528	.518	.695	.877		.038	.494
Indulgence versus Restraint	.828**	-.499**	-.078	-.400*	-.408*	1	.394*
	.000	.009	.705	.043	.038		.047
Individualism versus Collectivism	.524**	-.516**	.090	-.557**	.140	.394*	1
	.006	.007	.663	.003	.494	.047	

The relationship between country's innovation performance and the cultural dimensions Masculinity versus Femininity and Long term orientation versus Short term orientation was not statistically significant (respectively p=.529>0,05; p=.528>0,05). Therefore, the first assumption was that countries with lower levels of power distance and uncertainty avoidance and higher levels of individualism and indulgence could be more successful innovators.

The correlation method can only tell how the values of variables co-vary. Hence, in order to make a stronger claim and demonstrate how independent variables cause the dependent variable, regression analysis was applied. The table below presents the key statistics of the multiple linear regression model. The cultural dimensions explain the SII results of a given country in more than 75%.

Table 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.870[a]	.758	.737	.078
a. Predictors: (Constant), Indulgence versus Restraint , Power Distance				

A statistical significance test showed that the dimensions Uncertainty Avoidance Index and Individualism versus Collectivism were not significant (respectively p=.178>0,05; p=.480>0,05). Therefore, a regression model was built with SII as a dependent variable and Power Distance Index (coef. -.0,02, p=.016<0,05) and Indulgence versus Restraint (coef. .005, p=.000<0,05) as independent variables. The final results of t-test are presented in Table 6.

Table 6

Final results of statistical significance test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**.360**	.074		4.845	.000
	Power Distance	**-.002**	.001	-.309	-2.606	.016
	Indulgence versus Restraint	**.005**	.001	.674	5.693	.000
a. Dependent Variable: Summary Innovation Index						

It was checked and approved that the independent variables are non-random, the expected value of the disturbance term is zero, the error term is independently distributed and not correlated, and there is no exact linear relationship between independent variables. Therefore, the created model is in accordance with the Gauss-Markov Theorem.

The final proposed regression model: **SII=0,36-0,02PDI+0,05IND**. It demonstrates that a 1 point increase in Power Distance score results in a 0,02 point decrease in Summary Innovation Index, ceteris paribus. Meanwhile, a 1 point increase in Indulgence score results in 0,05 point increase in SII, ceteris paribus. As it was indicated before, the top innovators in EU are the Netherlands, Germany, Finland, Denmark and Sweden. These countries also have the smallest power distance (see Figure 1) and highest indulgence scores – see Figure 6 (except Germany, which is more restraint rather than indulgent). This data additionally proves the significance of the model.

Thus, it can be concluded that in order to improve their national innovation performance, countries should try to reduce corruption rates, seek for more equal distribution of power and trust between different hierarchical levels. Moreover, it is very important to change the direction of policy measures so that individuals living in a country could feel happier and healthier. A positive attitude and optimism help in finding inspiration which encourages technological changes. Meanwhile balance between work and leisure, ensured social security, favorable economic conditions, less of stereotypical attitude make a huge impact on psychological health and stability which automatically influences capabilities to innovate.

CONCLUSIONS

The European Union is constantly seeking convergence, yet the innovation performance of members is unequal. Currently, the modest innovators are Romania and Bulgaria while the Netherlands, Germany, Finland, Denmark and Sweden are the innovation leaders.

Academics agree that national culture, especially in terms of Hofstede's cultural dimensions, has a significant impact on innovation. Nevertheless, though the majority claim that innovative societies have the characteristics of high individualism, low power distance and low uncertainty avoidance, the final results of research studies are dissimilar because of the usage of different variables.

The particular research confirmed that innovation performance in EU is culture-specific. Using Summary Innovation Index as a dependent variable and six Hofstede's cultural dimensions as the independent ones, it was found out that Power Distance and Uncertainty Avoidance are negatively related to countries' innovation scores (respectively r=-.645; r=-.562). On the contrary, Individualism and Indulgence correlated positively (r=.828; r=.524). The dimensions of Masculinity versus Femininity and Long Term versus Short Term Orientation were not significant.

The regression analysis showed that the final innovation performance can develop on the basis of two dimensions – Power Distance and Indulgence (SII=0,36-0,02 PDI+0,05 IND). The findings concerning the effect of Power Distance are in line with the results of Shane (1993), Kaasa (2013), Herbig, Dunphy (1998), Hussler (2004), Rinne, et. al. (2012) while the discovered effect of Indulgence confirms the research results of Khan, Cox (2017) and Prim, Filho, Zamur, Di Serio (2017). This means that 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. Finally, ensured social security, balance between work and leisure, as well as elimination of stereotypes and strict social norms, could also make a huge impact on capabilities to innovate.

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