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INTERCULTURAL ASPECTS OF INNOVATION MANAGEMENT ON EXAMPLE OF INNOVATION ADOPTION IN EASTERN EUROPEAN COUNTRIES

ABSTRACT

Innovation management is affected by culture and this influence exists because culture can promote a better or worse innovative environment. This study aims to examine the relationships between the different national culture dimensions presented by Hofstede and innovation data by selected Eastern European countries to analyze which characteristics of national culture dimensions contribute to the improved innovation adoption. In order to shed light on the understudied relationship between national culture and innovation this study conducted an analysis of the relationship between Hofstede's national culture dimensions and the Global Innovation Index in selected countries. Higher values of long term orientation, individualism and uncertainly avoidance have a positive impact on innovation. On the other hand, the proposed relationship between power distance and innovation as well as masculinity and innovation were not confirmed and require further research.

KEYWORDS: *national culture, culture dimensions, innovation, global innovation index, innovation management, innovation adoption*

INTRODUCTION

Culture can be seen as one of the most important determinants of innovation. The relationship between national culture and innovation adoption is well established in the literature. However, ambiguity regarding the relationship still exists. The influence of different national culture dimensions in different empirical settings seems to provide contradicting results, especially when comparing countries with significant differences in national culture. In order to shed light on the understudied relationship between national culture and innovation in Eastern European countries this study conducted an analysis of the relationship between Hofstede's national culture dimensions and the Global Innovation Index in selected countries to find out if the proposed relationships that can be found in the literature hold true for the Eastern European countries.

Newman and Nollen (1996) claim that differences in national culture often have a great impact on various initiatives in business organizations. The relationship between innovation and culture can be analyzed at three levels: individual, organizational and national. Innovative organizations tend to be more flexible, future oriented, creative and willing to take more risks (Dobni, 2008). The relationship between national culture and innovation is well established in the literature, and a number of authors have analyzed how different national cultures tend to produce different innovative outputs (Bonetto et al., 2022; Kaasa and Vadi, 2010; Shane, 1993; Soloviov, 2022; Su, 2022).

National culture is defined by Hofstede (1983) as the collective programming of the mind, which distinguishes the members of a given group from members of a different group. Also, national culture deals with the difference in values between groups of distinct countries and nations (Hofstede, 2011). These differences are one of the problems for the management of multinational and multicultural organizations (Hofstede, 1983).

Innovation levels are affected by culture. Studies such as those of Van Everdingen and Waarts (2003), Kaasa and Vadi (2010), Mercan and Goktas (2011), Taylor and Wilson (2012), and Khan and Cox (2017) affirm that culture influences innovation. This influence exists because culture can promote a better or worse innovative environment. Khan and Cox (2017) relate national

culture to creativity and innovation, signaling that a more formal understanding of culture and innovation is being developed. Other study (Bogatyreva et al., 2019; Taras, et al. 2016) relates national culture dimensions to entrepreneurship and innovation, evidencing that specific aspects of national culture influence the relation between entrepreneurship and action. Nevertheless, a given set of national culture aspects can strengthen or mitigate the practice of innovative activities. Moreover, Elia, Messeni Petruzzelli, and Piscitello (2019) analyzed innovation levels in alliances of multinational companies with different national cultures. According to such perspective, subsidiaries tend to be less innovative when engaging with partners from different cultures.

Recent studies follow different lines of thought, showing that national culture and innovation still present many research gaps. However, the difference in relationship between national culture dimensions and innovation in Eastern European countries has not been researched so far and this paper aims to fill that gap.

Considering the importance of innovation for differentiation and competitiveness, in addition to the possible influence of culture in this context and the divergence in conclusions among authors on national culture and innovation, this study aims at answering the following research question: what are the cultural characteristics that affect innovation? Therefore, the paper explores the relationship between the different national culture dimensions presented by Hofstede and innovation data by Eastern European countries.

This study aims to examine the relationships between the different national culture dimensions presented by Hofstede and innovation data by selected Eastern European countries to analyze which characteristics of national culture dimensions contribute to the improved innovation adoption.

The paper is structured as follows: After this introduction the next section presents the literature review with discussions of the research model and hypotheses development. Then research methodology is presented in detail. Finally, research findings are outlined and discussed, implications are explored, limitation and futures research are described.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Scientists using and validating Hofstede's national culture dimensions prove that national culture dimensions are a valid and important construct and that differences in national cultures have a large impact on many different organizational and individual behaviors and outcomes. Hofstede developed a model of five dimensions of national culture that helps to explain basic value differences. This model distinguishes cultures according to five dimensions: Power Distance, Individualism-Collectivism, Masculinity-Femininity, Uncertainty Avoidance, and Long-Term Orientation (Hofstede, 2001). In his later research, Hofstede identified a sixth dimension of culture called degree of indulgence (Hofstede, 2011). However, indulgence, due to its much later identification and its absence in the original model of the culture dimensions, was excluded from this study.

Shane (1993) was one of the first researchers to analyze the relationship between Hofstede's national culture dimensions and innovation in different countries. He found that uncertainty avoidance has the highest impact on national innovation rates. Countries that scored low on power distance and high on individualism also showed higher rates of innovation at the national level. A number of other scientists conducted similar studies in different points in time. Kaasa and Vadi (2010) found a negative relationship between power distance, uncertainty avoidance and masculinity, while there was a positive relationship between individualism and innovation performance in a number of European countries. Woodside, Lars and Graham (2020) highlight the impact of cultural factors (power distance, individualism, long-term orientation) on innovative performance, and consequently on the economic structure of a country. Similarly, Bukowski and Rudnicki (2019) analyze the dimensions of national culture and innovation, highlighting that the dimension individualism alone does not fully justify the role of culture. Thus, the authors point out that long-term orientation and flexibility have a positive influence on innovation; however, this study considered only a few East Asian countries. In the same line, Gallego-Álvarez and Pucheta-Martínez (2020) analyzed the relationship between national culture and investments in innovation.

It shows that companies belonging to powerful masculine societies, with low uncertainty avoidance and long-term orientation, are more likely to invest in innovation and less likely to be individualistic. Taras, Steel and Kirkman (2016) also confirm the impact of cultural dimensions on innovation, however, claiming that the impacts may vary and reinforcing the need for more research in the area. Smale (2016) states that national culture should be in the heart of innovation research. He explains how national culture defines interaction between individuals and organizations involved in innovative activities by shaping attitudes towards failure, collaboration, resource sharing, creativity and entrepreneurship in a certain society.

Power distance is the degree to which a society adheres to formal power and status differences among group members. Individuals in low power distance cultures may be more apt to challenge assumptions, procedures, and authority figures. Hofstede (2011) suggested that lower power distance societies exhibit a greater tendency to innovate. Shane (1993) found that power distance was negatively related to patents and trademarks. In low Power Distance cultures, innovators may be able to more easily manage relations across hierarchical borders, challenge authority, and build independent networks of support (Kirkman, Lowe, and Gibson, 2017).

According to Hofstede (2011), organizations in countries with high power distance are often characterized by centralized decision structures, authority, and the use of formal rules. Sharing of information is constrained by hierarchy. High levels of centralization and formalization have been found to be associated with lower rates of innovation adoption (Rinne, Steel and Fairweather, 2012). A reason might be that in centralized organizations, top management is not always able to identify operational problems and to suggest the introduction of innovations to solve these problems. Moreover, in formal organizations, subordinates may take less initiative to consider and discuss the introduction of new products within the company. They will generally wait for the top management to take the initiative (Kreiser et al., 2010). Low power distance countries are characterized by open communication in organizations and lack of fear from authority. Employees in low power distance countries are also more willing to question management decisions. Innovation is a non linear process that is usually iterative and

requires clear communication and cooperation between different hierarchical levels at an organization. Individuals open to questioning the status quo are also expected to be better at innovation (Dobni, 2008). Therefore, the first hypothesis of this study is thus as follows:

H1: LOW LEVEL OF POWER DISTANCE POSITIVELY INFLUENCES THE VALUE OF GLOBAL INNOVATION INDEX.

Individualistic societies place a higher value on personal goals. Shane (1993) found individualistic societies to be more innovative. Other studies found individualistic cultures were more apt to adopt technologically innovative products. In addition, it exists a positive relationship between high individualism and innovation measures (Rinne, Steel and Fairweather, 2012). Collective societies place a higher value on group goals. Creativity is essentially the act of an individual, sometimes in opposition to the prevailing norms of a group. In collective societies, individuals tend to subordinate their self-interests to the interests of the group. Individuals in collective societies may choose not to advance new ideas that challenge members of the group or society (Van Everdingen and Waarts, 2003). When discussing the general determinants of innovation at an organizational level it can be stated that innovation is non-linear, flexible processes and requires creative thinking. It can therefore be expected that more individualistic societies should be more innovative (Khazanchi et al., 2007). The second hypothesis of this study is thus as follows:

H2: HIGHER LEVEL OF INDIVIDUALISM POSITIVELY INFLUENCES THE INNOVATION ADOPTION.

Uncertainty avoidance differentiates societies on willingness to assume risk. Hofstede (2011) suggested that societies exhibiting low uncertainty avoidance are more willing to take risks and to accept opinions other than their own, both of which encourage innovation and entrepreneurship. Culture scoring high on uncertainty avoidance are more apt to adapt rules to minimize ambiguity. In such cultures, innovators may be less likely to violate societal

norms even when doing so would increase the likelihood of innovation implementation. Societies that have lower levels of uncertainty avoidance are characterized by the willingness of the members of the society to accept ambiguity in everyday life as a fact. These societies accept that unexpected things do happen in life and they tend to be more loose and have fewer regulations. Further studies found empirical support for a relationship between low uncertainty avoidance and innovation (Van Everdingen and Waarts, 2003; Baregheh, Rowley and Sambrook, 2009). Organizations in countries with a high uncertainty avoidance index generally show characteristics such as resistance to innovations, highly formalized management and the constraining of innovations by rules (Hofstede, 2001). In high uncertainty avoidance cultures, risk-averse attitudes imply that companies will not take unnecessary risks and only adopt innovations if their value has already been proven in the market (Smale, 2016). Therefore, the third hypothesis of this study is thus as follows:

***H3: LOW LEVEL OF UNCERTAINTY AVOIDANCE POSITIVELY
INFLUENCES THE INNOVATION ADOPTION.***

National cultures with high long-term orientation value are more problem solving oriented and pragmatic. Long-term oriented societies are also not fixed on their traditions and are more willing to change their way of doing things. Cultures with a long-term orientation are characterized by values like persistence, adaptations of traditions to new circumstances, personal adaptability, and the idea that most important events in life will occur in the future. Long term-oriented societies tend to have higher growth rates when comparing to short-term oriented societies starting at the same level of economic development. All of the stated traits of long-term oriented societies should be beneficial for innovation (Hofstede, 2011). Van Everdingen and Waarts (2003) investigated the effects of national culture on the adoption of innovations using the Hofstede dimensions. They found that higher degrees of long-term orientation were related to increased adoption of innovations. Companies in cultures with a long-term orientation to focus on future results, and be more receptive to changes than companies operating in a short-term orientation culture. By contrast, in cultures with short-term

orientation, the focus is on the past. Therefore, such cultures are expected to be less innovative (Smale, 2016). Therefore, the fourth hypothesis of this study is thus as follows:

H4: HIGHER LEVEL OF LONG-TERM ORIENTATION POSITIVELY INFLUENCES THE INNOVATION ADOPTION.

Masculine cultures are more achievement oriented and exhibit less gender egalitarianism. By contrast, feminine cultures are more relationship oriented. Hofstede (2001) suggests that in organizations in masculine cultures, emphasis is on rewards and recognition of performance, and further, on training and improvement of the individual, both characteristics that are common to innovative organizations. This study proposes a positive relationship between masculinity and innovation.

H 5: HIGHER LEVEL OF MASCULINITY POSITIVELY INFLUENCES THE INNOVATION ADOPTION.

Innovation management is affected by culture and numerous studies affirm that culture influences innovation. This influence exists because culture can promote a better or worse innovative environment.

METHODOLOGY AND RESEARCH RESULTS

In order to analyze the proposed relationship between national culture dimensions and innovation the secondary data have been used. The independent variables for this study are Hofstede's cultural dimensions. The scores for each of the five dimensions have been used in the model. Power distance measures the inequality in power between the members of society and how the inequality is accepted. High scores for power distance signify the acceptance of power differences and inequality. Individualism is the next dimension and a high score signifies a society where the focus is only on the individual. Lower scores signify a focus on groups and decision are based on group

welfare. Uncertainty avoidance captures how a society feels about uncertainty and ambiguity. Higher scores represent an aversion to uncertainty. Long-term orientation refers to the extent to which a society encourages and rewards planning for the future over short term, results and quick gratification. High scores on masculinity represent a society that is focused on achievement, competition and assertiveness, while lower scores suggest a cooperative society focused on relationships and quality of life. Innovation was measured using the Global Innovation Index from 2021, which was used as the dependent variable for this study.

The Global Innovation Index comprises two sub-indices, Innovation Input and Innovation Output. The first sub-index is formed by innovation facilitators, in other words they represent the conditions necessary for obtaining innovation, and comprise five dimensions: institutions, human capital and research, infrastructure, market sophistication, and business sophistication. The second sub-index represents innovation results, or performance, and is formed by two dimensions: knowledge and technology outputs and creation outputs. The Global Innovation Index has been continually evolving in order to adjust the measures that determine innovation and every year new participating countries are incorporated (Huarng and Yu, 2022).

Eastern European countries that are members of the European Union, as well as Serbia and Ukraine, were selected for this study. The reason for including these two non-EU countries was to diversify the group of analysed Eastern European countries. Moreover, these two countries are important economies with significant innovation potential, which can influence the development of Central and Eastern Europe.

The Global Innovation Index values for the selected countries as well as the values of national culture dimensions can be seen in Table 1.

Table 1. *The Global Innovation Index values for the selected Eastern European countries and values of national culture dimension*

	Global Innovation Index 2021	Power Distance	Individualism	Uncertainly avoidance	Long-term orientation	Masculinity
Romania	35.6	90	30	90	52	42
Bulgaria	42.4	70	30	85	69	40
Croatia	37.3	73	33	80	58	40
Poland	39.9	68	60	93	38	64
Latvia	39.9	44	70	63	69	9
Slovakia	40.2	100	52	51	77	100
Hungary	42.7	46	80	82	58	88
Lithuania	40.0	42	60	65	82	19
Estonia	49.9	40	60	60	82	30
Czech Republic	49.0	57	58	74	70	57
Slovenia	44.1	71	27	88	49	19
Serbia	35.0	86	25	92	52	43
Ukraine	35.6	92	25	95	55	27

Source: www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf and www.hofstede-insights.com

Multiple regressions were used to identify the relationship between the independent variables (Hofstede's culture dimensions) and dependent variable – The Global Innovation index. The results of regression analysis have been shown in the table 2.

Table 2. *The results of regression analysis*

Independent variables – national culture dimensions	Standardized coefficients	t	Significance level
	Beta		
Power distance	0,052	0,381	0,670
Individualism	0,378	4,362	0,000
Uncertainly avoidance	0,291	3,874	0,000
Long-term orientation	0,397	4,723	0,000
Masculinity	0,057	0,328	0,640
Dependent variable: Global Innovation Index R ² = 0,783, F = 29,274, significance level = 0,01.			

Source: own study

The result shows that R-square was 0,783, which demonstrates that independent variables explain 78,3% of the variance in innovation adoption (The Global Innovation Index). The linear relationship between Hofstede's cultural dimensions with innovation adoption level is significant with an F-value of 29,274 at the 0,01 significance level. Therefore, the model fits this study.

According to the results, power distance did not have a statistically significant relationship with level of innovation adoption due to the significance levels (0,670) being higher than 0,05. Hence, Hypothesis 1 is rejected.

The significance level of individualism with Global Innovation Index was 0,000, which is less than 0,05. Therefore Hypothesis 2 is accepted. Individualism was the second highest coefficient (beta = 0,378), hence, higher level of individualism positively influences the innovation adoption.

The significance level of uncertainty avoidance with Global Innovation Index was 0,000, hence, Hypothesis 3 is accepted. The beta value for this variable was 0,291. Therefore, low level of uncertainly avoidance has a significant positive effect on innovation adoption

The significance level of long-term orientation with online shopping satisfaction was 0,000, therefore, Hypothesis 4 is accepted. The test also showed that long term-orientation had the highest coefficients (beta = 0,397) compared

to others culture dimensions. In other words, long-term orientation has the highest positive impact on innovation adoption level.

According to the results, masculinity did not have a statistically significant relationship with level of innovation adoption due to the significance levels (0,640) being higher than 0,05. Hence, Hypothesis 5 is rejected.

Surprisingly, power distance and masculinity were shown to be insignificant in the model. Long term orientation, individualism and uncertainty avoidance were the three dimensions of national culture that showed significant in the model. As hypothesized, long term orientation has shown positive influence on a country's global innovation index values. The same goes for uncertainty avoidance and individualism, that have shown to have positive and significant impact on the global innovation index in analyzed countries. Thus, hypotheses 1 and 5 of this research were rejected, while hypotheses 2, 3 and 4 are confirmed.

DISCUSSION

The results of the study are somewhat surprising. The analysis has shown that power distance does not seem to play an important role in innovation adoption, because this culture dimension was insignificant in the model. One of the possible reasons for the insignificance of power distance in the model could be the use of global innovation index as a measure for innovative performance. As well as for the analysis of the relationship between individualism and innovation, it is possible that a larger sample of national cultures could give more comprehensive results. Moreover, the role of power distance in innovation adoption is unclear. In low power distance cultures, innovators may more easily manage relations across functional and hierarchical boundaries. They may build independent networks of support, be more likely to minimize the importance of a superior's acquiescence, and go outside the immediate hierarchy for support. On the other hand, in high power distance cultures, creative people may be expected to work through hierarchical organizational channels with only support for the ideas endorsed at the top.

Similarly, masculinity dimension was insignificant in the model. Values typical for masculine and feminine cultures influence the innovation performance

in uncertain way. For example masculine values, such as achievement and motivation suggest positive relationship between masculinity dimension and innovation adoption. On the other hand, feminine societies where the focus is on people and cooperation, can create a more supportive climate for innovators. Feminine cultures are characterized by values like equality, solidarity, social relationships and managers' use of intuition and seeking consensus. Therefore, they can create a more supportive climate for innovators.

Regarding the relationship between long term orientation and innovation, this study has confirmed that countries with higher levels of long term orientation have a higher value of the global innovation index . National cultures with higher values of long term orientation are more willing to embrace new ideas and solutions and are more pragmatic and problem solving oriented, all of the traits that can be beneficial to innovation. The positive hypothesized relationship between uncertainty avoidance and global innovation index has also been confirmed. Uncertainty avoidance is not necessarily related to risk aversion since it can be expected that national cultures that are more prone to risk taking should be more innovative.

The positive relationship between high level of individualism and innovation adoption has also been confirmed. The higher the country's individualism score, the more likely companies in that country are to adopt innovations, and thus the higher the innovation adoption rate.

CONCLUSION

The main research goal of this study was to show if the proposed relationships between national culture dimensions and innovation that can be found in the literature hold true for Eastern European countries. This study has shown that higher values of long term orientation, individualism and uncertainty avoidance have a positive impact on innovation. On the other hand, the proposed relationship between power distance and innovation as well as masculinity and innovation were not confirmed and require further research. This study has a number of limitations. The main limitation is a relatively low number of countries taken into analysis. Another limitation is the

lack of a comprehensive and complete innovation measure that would take into account all of the various phases of the innovation process as well as the innovation inputs and outputs. Regardless of these limitations, the study has achieved a part of its main research goal in proving that the proposed relationships between some national culture dimensions and innovation hold true for Eastern Europe countries. In addition, the study has also opened some new questions regarding the relationship between masculinity and power distance and their influence on innovation adoption that require further research. One of the propositions for future research would be to enlarge the number of national cultures taken into the sample and try analyzing different clusters of national cultures.

Future research should explore the impacts of other variables, which can determinate innovation performance. A future study should try to validate the result by using a wider sample. Finally, as innovation cannot be explained by culture alone, future research will analyze other elements that contribute to the development of a favorable environment for innovation

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