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Prediction of the innovative capacity of countries based on their cultural dimensions: an analysis of the global innovation index

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ABSTRACT. This article seeks to examine how Hofstede's cultural dimensions act as predictive variables for country innovation. In order to clarify how national culture influence countries' capacity for innovation, regression models were developed, and comparisons were made. We will use the multivariate linear regression method for the analysis, with the scores obtained by countries in the GII as the dependent variable and the values of cultural dimensions as explanatory variables. Individualism, long-term orientation and indulgence dimensions have a positive influence on countries' innovation. However, there is a negative relationship between uncertainty to avoidance and innovation. Possible reasons for these associations may include greater professional focus, openness to new ideas and greater resistance to innovation. Since the reality of each country is different, whether due to its culture, history and social aspects or due to its geographical location and availability of natural resources, it is not possible to simply import policies from one context to another. Given these factors, an analysis is needed on how infrastructure and cultural difference can influence the innovative performance of countries. This study aims to expand the literature on how culture in its different forms assists in the innovation process of countries by presenting quantitative and qualitative results on which cultural dimensions are most relevant to innovation.

Keywords: national culture; innovation; cultural dimensions; regression analysis.

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Introduction

Globalization, contrary to what one might imagine, has not diminished the fundamental role played by nations in terms of world competitiveness. Cultural, political and legal aspects remain relevant (Ronen & Shenkar, 2013). Therefore, it is essential to permanently update and review the obligations of the States in promoting the necessary determinants for the competitive success of their companies in the global market.

Since the first studies on National Innovation Systems, its context has been treated with extreme relevance once "[...] technological innovation occurs within a specific industrial structure and national context, a better understanding of this context or system will lead to better government technology and innovation" (OECD, 1997, p. 13).

At its origin, the study of innovation systems focused primarily on the national level and its institutional structure (Lundvall, 2010; Nelson, 1993; Patel & Pavitt, 1994; Freeman, 1995). Over the years there have been changes in the level of analysis units, moving to levels such as technological systems (Carlsson & Stankiewicz, 1991; Carlsson, 2006), sectorial systems (Breschi & Malerba, 1997) and regional systems (Cooke, Uranga, & Etxebarria, 1997). However, even though the international flow of technology has become increasingly significant, the national level of analysis remains the most relevant due to the interactions between the different actors at this level (OECD, 1997; Lundvall, 2007; Casadella & Uzunidis, 2017).

According to Huntington (1993), cultural differences are and will continue to be the strongest force for dividing nations. Therefore, national culture will be a significant determinant of the global environment that companies must consider when building their strategies and making operational decisions (Porter, 1990; Baruch, 2002). In this sense, several studies have sought to understand the role of national culture, in order to clarify how this integration can represent advantages to economies (Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004; Ronen & Shenkar, 2013).

Among the main approaches to national culture is that of cultural dimensions, presented by Hofstede in his book 'Culture's Consequences' from 1980. According to Peterson (2003, p. 128) "Perhaps the first edition of Culture's Consequences did not create the field of comparative transcultural studies, but it has certainly shaped the basic themes, structure and controversies of the field for more than 20 years."

Since there is no single model to be followed, each economy has National Innovation Systems that are specific to their contexts. Thus, each country's model is dependent on its historical and cultural context, its institutions and available technologies (Binkauskas, 2014).

As the country context has a great influence on the success or failure of National Innovation Systems, the analysis of the set of institutions in each economy must be thoroughly understood in order to assist in the development of local innovation systems (Ács, Audretsch, Lehmann, & Licht, 2017).

Since the reality of each country is different, whether due to its culture, history and social aspects or due to its geographical location and availability of natural resources, it is not possible to simply import policies from one context to another. Before that, a detailed understanding of the functioning of each National Innovation System is necessary to determine which problems should be tackled through public policies (Fagerberg, 2017).

Given these factors, an analysis is needed on how infrastructure and cultural difference can influence the innovative performance of countries. Therefore, this article seeks to examine how Hofstede's cultural dimensions act as predictive variables for country innovation. Thus, the question that this study intends to answer is: How to estimate the innovation of a country based on cultural differences?

This work is divided into eight sections. The first section consists of the introduction and research question presentation. Then, sections 2, 3, and 4 presents, respectively, the conceptual bases on cultural dimensions, innovation and the index used in the article. In the fifth and sixth sections, the hypotheses and the method used in the practical stage of the work are developed. The seventh section presents the results obtained. In section 8 the conclusions and limitations are presented.

Cultural dimensions

The model created by Hofstede has proven to be one of the most influential in the study of culture, and its importance has been recognized even by authors who propose competitive models (House et al., 2004). The extent to which this approach has been used by empirical studies is one of the reflections of its importance (Kirkman, Lowe, & Gibson, 2006; Engelen & Brettel, 2011).

Hofstede (2001) carried out his research on Cultural Dimensions between 1967 and 1973. He carried out a survey in different plants of the IBM company, covering a total of 72 countries and obtaining more than 116,000 responses. The aim of the study was to develop a terminology that could describe different national cultures and was empirically grounded. Noteworthy is the fact that despite its dimensions being widely used for purposes other than research on national culture, the author himself makes reservations about such use in addition to the exclusive relationship at the national level (Hofstede, 1995).

Hofstede (1980; 1983) identifies the first four Cultural Dimensions: Power Distance, Individualism versus Collectivism, Aversion to Uncertainty, Masculinity versus Femininity. In the early 1990s, a fifth dimension was added: Short-Term vs. Long-Term Orientation, and more recently, in the 2000s, the sixth dimension was added: Indulgence vs. Constraint.

The first dimension presented by Hofstede is called Power Distance. It assesses the extent to which interpersonal influence and power is distributed in organizations, always having as a reference point the view of the less powerful. The core principle of this dimension is inequality from the point of view of the subaltern. In the author's own words, Power Distance indicates the "extent to which the less powerful members of a country's institutions and organizations expect and accept that power will be unequally distributed" (Hofstede, 2001, p. 98).

Individualism and collectivism are the polar opposites of the second cultural dimension. These poles relate to the degree to which a subject is predisposed to act as an individual as opposed to acting as part of a group. It is not possible to draw a dividing line between the poles, indicating one as beneficial and the other as a source of harm, but rather explaining how societies interpret them. In some cultures, for example, Individualism is seen as a blessing and a source of well-being, on the other hand, in other societies it is seen as a form of alienation (Hofstede, Hofstede, & Minkov, 2010).

The duality between the sexes is a fundamental issue that different societies deal with in different ways. The third-dimensional core is not simply linked to biological sex, but rather to the prominent emotional role

of each gender. Thus, in a male society, men must be assertive, resilient and focused on material success, while women are expected to be sensitive and focused on quality of life. On the other hand, in a female society, emotional gender roles overlap, with this it is expected that both sexes present characteristics related to affectivity and quality of life (Hofstede, 2001).

Uncertainty about the future is inherent to human beings and has been addressed by different domains of knowledge, from technological branches, passing through laws and even religions. However, at the national level, uncertainty takes the form of new technologies, rules and rituals (Hofstede, 2001). This dimension, called aversion to uncertainty, can be defined as "[...] the extent to which members of a culture feel threatened by ambiguous or unknown situations" (Hofstede et al., 2010, p. 191).

The fifth dimension presented by Hofstede is posterior to the others, having been created from a survey applied in China to understand the values of this people. In this research conducted by Michael Bond, certain values such as hard work ethic, persistence and long-term mindset were found (Tan & Khoo, 2002). The fifth dimension was defined by Hofstede et al. (2010, p. 239, grifo do autor) as follows:

> [...] long-term orientation stands for the fostering of virtues oriented toward future rewards – in particular, perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present – in particular, respect for tradition, preservation of 'face', and fulfilling social obligations

The sixth and final dimension analyzes the importance of happiness and control of life. Highly indulgent societies allow people to freely satisfy their basic human needs and desires. In them, individuals can act as they wish. On the other hand, in highly constrained societies, people suppress their impulses through restrictive social norms. Restrictive societies have a high regard for moral discipline and people tend to be more pessimistic (Hofstede et al., 2010).

Innovation

The starting point we will take to discuss the concept of innovation will be the Schumpeterian approach to the term. For Schumpeter (1982) an innovation means the use of new combinations of materials and forces to produce new artifacts, products, processes or systems. However, this innovation can only be seen as such, in its full sense, when there is a commercial transaction and it generates wealth.

Based on this first and broad definition of innovation, Nelson (1993) clarifies that innovation is not only the introduction of a new process or product on the market, but it also occurs whenever companies dominate production processes or product projects that are new. for them, though not for the market. This process of "diffusion" of knowledge would be crucial for increasing national technological capacity, ensuring greater competitiveness for economies.

This vision of innovation is endorsed by Lundvall (2007) when verifying that the concept of innovation goes beyond the event of introducing a 'new combination' in the market, but also includes its diffusion and use, as new processes and products become attractive to the market only after their widespread use.

An important contribution is also presented by the OECD in the Oslo Manual. According to the OECD/Eurostat (2018, p. 20) innovation is defined as: "An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)".

This definition is in line with the definitions of Nelson (1993) and Lundvall (2007), as the minimum requirement is that the novelty must be internal to the company, which may or may not be the market pioneer.

For the development of this study, the Oslo Manual presents another important definition of 'innovation activities'. According to OECD/Eurostat (2018, p. 68), "[...] innovation activities include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm".

Innovation activities are linked to the learning process defended by Lundvall (2010) as fundamental to the understanding that innovation is not a single event, but a process. A cumulative process, as Schumpeter (1982) already understood, is an interactive process, as it depends on different actors to occur. In this work we use the same definition of innovation that the Global Innovation Index uses in its last update, that is, the one from the Oslo Manual 2018 developed by the OECD (WIPO, 2021).

Global innovation index

The Global Innovation Index (GII) is a report resulting from a collaboration between Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO). Its objective is to develop metrics and

approaches that capture the breadth of innovation in societies, providing tools that can help governments create policies aimed at long-term growth.

The GII is in its 14th edition, having started in 2007. Its scope has grown from 107 countries in 2007 to 132 in 2021. The 132 economies included in the study correspond to 94.3% of the population and 99.0% of the world GDP.

Three measurements are calculated in GII (Cornell University, INSEAD, & WIPO, 2018):

i) Innovation input sub-index: formed by five input pillars, it captures the elements of the national economy that make innovation possible;

ii) Innovation products sub-index: formed by two pillars that represent the results of innovative activities in the economy;

iii) GII overall score: obtained by the simple average between the two sub-indices.

The GII is formed by seven pillars that propose to present strengths and weaknesses of the investigated economies. Each pillar is divided into three sub-pillars, formed by individual indicators, reaching a total of 80 indicators in 2020.

Of the 80 variables used to calculate the index, 4 are qualitative and subjective, having as source the World Economic Forum's Executive Opinion Survey (EOS). Another 58 are quantitative and objective in nature, from different sources such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Industrial Development Organization (UNIDO), World Intellectual Property Organization (WIPO), World Bank, Joint Research Center of the European Commission (JRC), PwC, Bureau van Dijk (BvD), Thomson Reuters, IHS Global Insight, Wikimedia Foundation, and AppAnnie. Finally, 18 are from indicators composed by other agencies, such as World Bank, International Telecommunication Union (ITU), UN Public Administration Network (UNPAN), and Yale and Columbia Universities.

Development of hypotheses

Based on the concepts presented, it is possible to draw hypotheses on how each cultural dimension is able to predict the capacity to generate innovation in each country. For this, we will use the GII's overall score as a proxy for the countries' capacity to innovate.

Thus, the hypotheses are developed as follows:

H_1: There is a negative relationship between power distance (PDI) and a country's capacity for innovation.

According to Hofstede (2001), high values for this dimension are associated with countries with more centralized governments and good relations with authorities. In view of this, it is possible that innovation in countries with higher scores in this dimension is primarily guided by the government and that there are greater bureaucratic difficulties to innovate in the private sector.

H_2: There is a positive relationship between individualism (IVD) and a country's capacity for innovation.

According to Hofstede et al. (2010), in countries with high individualism, people feel freer to adopt their own approaches to work and seek greater challenges in order to obtain a sense of professional fulfillment. These two aspects of individualistic societies can help in the company’s innovative performance in these societies.

H_3: There is a positive relationship between masculinity (MAS) and a country's capacity for innovation.

According to Hofstede et al. (2010), male societies are focused on material success, and rewards are based on impartiality. Therefore, these societies are expected to seek innovation as a means to achieve greater profits and greater recognition.

H_4: There is a negative relationship between uncertainty avoidance (UIA) and a country's capacity for innovation.

Hofstede et al. (2010) point to the fact that in societies with less aversion to uncertainty, innovation activities will be more frequent. On the other hand, societies that have high values in this dimension are more prone to fundamentalist and concrete thoughts and less open to new scientific theories.

H_5: There is a positive relationship between long-term orientation (LTO) and a country's capacity for innovation.

Long-term orientation should also offer advantages to innovation as this activity demands time and resources. The process of creating new technologies, in general, demands years of studies and investments in research. Countries with a low score in this dimension may have difficulties, for example, in investing in basic research, since this type of research does not necessarily seek practical application or profit.

H_6: There is a positive relationship between indulgence (IVR) and a country's capacity for innovation.

People from indulgent countries are generally more receptive to foreign cultures and are better able to manage their work and leisure time. These two factors can help in the process of creating new technologies as there is greater openness to the new. Furthermore, in lenient countries, freedom of expression is seen as important so that society is always open to new ideas.

Material and methods

This paper seeks to examine how Hofstede's cultural dimensions act as predictive variables for country innovation. Thus, we will use the multivariate linear regression method for the analysis, with the scores obtained by countries in the GII as the dependent variable and the values of cultural dimensions as explanatory variables.

The simple linear regression model can be generalized as follows:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_k X_{ki} + \varepsilon_i$$

Being:

Y the dependent variable.

X_{ki} the explanatory or independent variables.

i = 1, 2, 3, ..., n the number of observations.

β_k are model parameters.

ε_i is the error term.

In this model, the data used are cross-sectional, that is, data from different subjects and multiple variables are collected and analyzed in the same time period.

The HDI is an index that aims to summarize progress in three dimensions of human development: income, education and health. Two of these dimensions are directly linked to innovative activities (income and education), while the third (health) is improved through innovation. Therefore, as this index assesses different aspects of innovation, it was used as an independent variable in the linear regression model.

So, initially we will have the following equation:

$$GII_i = \beta_0 + \beta_1 PDI_i + \beta_2 IDV_i + \beta_3 MAS_i + \beta_4 UAI_i + \beta_5 LTO_i + \beta_6 IVR_i + \varepsilon_i \quad (1)$$

Subsequently, a second equation model will be created with the Human Development Index (HDI) score as an explanatory variable and the individual introduction of cultural dimension variables, resulting in six new models. The individual introduction allows us to observe the increase in the quality of the model that comes from each variable. The equations obtained are as follows:

$$GII_i = \beta_0 + \beta_1 IDH_i + \varepsilon_i \quad (2)$$

$$GII_i = \beta_0 + \beta_1 IDH_i + \beta_2 PDI_i + \varepsilon_i \quad (3)$$

$$GII_i = \beta_0 + \beta_1 IDH_i + \beta_2 IDV_i + \varepsilon_i \quad (4)$$

$$GII_i = \beta_0 + \beta_1 IDH_i + \beta_2 MAS_i + \varepsilon_i \quad (5)$$

$$GII_i = \beta_0 + \beta_1 IDH_i + \beta_2 UAI_i + \varepsilon_i \quad (6)$$

$$GII_i = \beta_0 + \beta_1 IDH_i + \beta_2 LTO + \varepsilon_i \quad (7)$$

$$GII_i = \beta_0 + \beta_1 IDH_i + \beta_2 IVR_i + \varepsilon_i \quad (8)$$

$$GII_i = \beta_0 + \beta_1 IDH_i + \beta_2 PDI_i + \beta_3 IDV_i + \beta_4 MAS_i + \beta_5 UAI_i + \beta_6 LTO_i + \beta_7 IVR_i + \varepsilon_i \quad (9)$$

Data on the cultural dimensions of Hofstede were obtained from the online database on the Hofstede Insights website (https://hi.hofstede-insights.com/). As well as the Global Innovation Index that was obtained from its website (https://globalinnovationindex.org) and the Human Development Index obtained from (http://hdr.undp.org/en/data).

Results and discussion

Table 1 shows the correlation coefficients between the variables of the models developed in this article. According to Pallant (2007), independent variables whose correlation coefficient is greater than 0.7 or less than -0.7 should not be included in the same regression model.

Table 1. Correlations between variables.

	GII	PDI	IDV	MAS	UAI	LTO	IVR	HDI
GII	1							
PDI	-0.5445**	1						
IDV	0.6425**	-0.6456**	1					
MAS	-0.0004	0.0627	0.1202	1				
UAI	-0.1721	0.1442	-0.1148	-0.1002	1			
LTO	0.5686**	-0.0624	0.2288*	0.0031	0.0983	1		
IVR	0.1427	-0.3529**	0.2081	0.0480	-0.1698	-0.4392**	1	
HDI	0.8870**	-0.6398**	0.6659**	-0.0148	-0.0407	0.4244**	0.2375*	1

The symbols*, **represent the significance of 5% and 1% respectively.

It can be observed that among the independent variables there are only three correlations above 0.5, namely: -0.6456** (IDV/PDI), -0.6398** (IDH/PDI), and 0.6659* * (HDI/IDV). Still, the values remain below the 0.7 recommended by Pallant (2007) to avoid multicollinearity.

We can also observe that the statistically significant correlations between the dependent variable and independent variables are above 0.5, indicating high linearity between them, especially between GII and HDI, which reaches the value of 0.8870**.

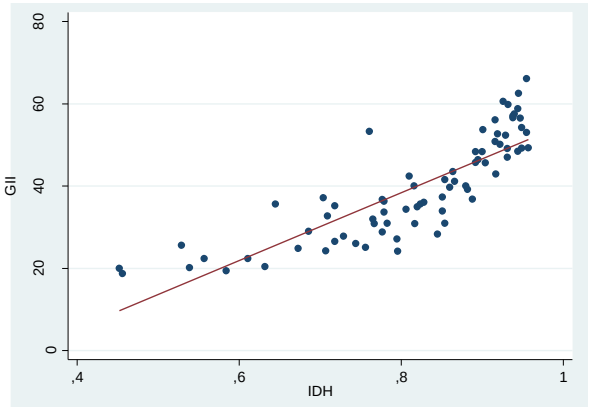

Figure 1. Linearity between GII and HDI.

This value is interesting for the second stage of the research, when we will add cultural variables one by one to the HDI, to verify the increase in quality that each individual variable causes in the model. In addition to this value, we can see the linearity relationship between GII and HDI in Figure 1.

Using the Stata software, it was possible to perform multivariate linear regressions. First, the assumptions were evaluated to subsequently carry out the development of the models. All models obtained were statistically significant at 1%.

The Breusch-Pagan/Cook-Weisberg Test was performed to verify the heteroscedasticity of the models. The result obtained indicates that the regression error variance is constant and finite for all models, guaranteeing homoscedasticity. The Variance Inflation Factor (VIF) was also evaluated, and in all nine models the values of the variables are below 5, establishing that there are no multicollinearity problems.

The nine models developed for this analysis can be seen in Table 2.

Model 1 aimed to investigate whether cultural dimensions as a whole are good predictive variables for country innovation. As we can see, the model explains 72.40% of the countries' innovation index, a considerably high value. In this model, the power distance and masculinity variables were not statistically significant, while aversion to uncertainty was significant at 5% and the remaining three were significant at 1%.

The second model is the only model that used a simple linear regression and was developed as a basis for the following models that include cultural dimensions one by one. Its explanatory power was 69.86% and will serve as a basis for better understanding the relationship between each dimension and the innovation index.

Model 3 explores the relationship between power distance and innovation. According to hypothesis 1, the greater the distance from power, the smaller the innovation index should be. However, in the first model this relationship could not be observed due to the lack of statistical significance of the variable, in this PDI model it has statistical significance at 5% and corroborates H1, with a negative relationship between the variables. This model presents an increase of 2.23% per second, reaching an explanatory power of 72.09%.

Hypothesis 2 deals with the influence of individualism on innovation. This relationship is examined in model 4 and, as in model 1, it presents a positive association between the variables, confirming H2. Both models present this association at 1% significance. This model shows the third largest increase with 3.78%, reaching the explanatory power of 73.64%. Hofstede (2001) had already correlated this dimension with the wealth of countries, we cannot stress that among the countries with the greatest propensity to innovation are also the richest, therefore, a high explanatory power for this variable was expected.

In model 5, the cultural variable did not present enough statistical significance, in addition, as mentioned earlier, masculinity had not already shown significance in the model. Thus, this variable added only 0.04% of explanatory power to the model, reaching 69.90%. As a result, hypothesis 3 could not be validated.

The sixth model deals with the relationship between aversion to uncertainty and innovation. As expected, their relationship is negative, since the greater the aversion to uncertainty, the greater the use of rules by society, which leads to less openness to innovation. This was the variable with the second largest increase in explanatory power, having increased 7.44% in the second model and reaching a level of 77.30% of explanatory power. By presenting a negative relationship between the variables, the model validates hypothesis 4.

The third largest increase in explanatory power came from model 7. With an increase of 4.10%, this model presents an explanatory power of 73.96% of the innovation index. The long-term orientation variable showed a positive relationship with innovation, corroborating hypothesis 5. An example of how long-term orientation is important for innovation can be taken from the amount of investment in basic research, since this type of research does not present immediate results but consolidates the foundations for innovation in the future.

Model 8 sought to investigate the relationship between the degree of indulgence of a population and its capacity to generate innovation. As in model 5, here the cultural variable did not show statistical significance, but unlike MAS, the IVR showed significance in the first model, which may indicate that when related to another cultural characteristic it has a positive relationship with innovation. Even so, it is not possible to validate hypothesis 6. This model presents an increase of 0.10%, reaching the level of 69.96% of explanatory power.

Finally, model 9 was statistically significant at 1% and, as can be seen in the table, three variables presented explanatory power at 1%, namely: HDI, uncertainty avoidance and long-term orientation. Two others showed explanatory power at 5%: individualism and indulgence. The result of this model is in line with the previous models and presents the greatest increase in explanatory power compared to the second model (15.98%), reaching a value of 85.84%, indicating that national culture, when analyzed together, can play a key role in innovation.

Thus, of the six initial hypotheses, four were validated (H_2, H_4, H_5 and H_6). That is, there is a positive relationship between individualism, long-term orientation and indulgence with innovation variable. Meanwhile, there is a negative relationship between uncertainty avoidance variable and innovation.

For Hofstede (2001) individualism is closely linked to the wealth of nations, this study shows that this dimension also has direct relationships with innovation, so it is possible that more innovative nations are also richer and more individualistic. Countries with long-term oriented cultures are more likely to accept new ideas and solutions, being more pragmatic and problem-solving oriented. All these aspects are beneficial for innovation. Furthermore, this dimension should offer advantages to innovation as this activity demands time and resources. The process of creating new technologies, in general, requires years of studies and investments in research. Indulgence positively influences a country's creativity and the willingness and ability of employees of that country's companies to innovate and adopt new technologies. In addition, in general, people are more receptive to foreign cultures and are able to better manage their work and leisure time, helping in the innovation process. On the other hand, aversion to uncertainty has a negative influence on the countries' capacity to generate innovation. The greater the uncertainty avoidance, the greater the use of rules by society, which leads to less openness to innovation. Therefore, the countries with the highest scores in this dimension will be those with greater difficulties in inventing new technologies and greater resistance to innovations.

On the other hand, hypotheses H_1 and H_3 could not be validated. This may have occurred due to the fact that innovation process has different stages, so it is possible that each stage is better performed by different poles of the dimensions analyzed by these hypotheses. For instance, early in the development of a new product, the most effective culture may be low power distance and feminine. However, at the time of launching this same product on the market, the most effective culture may be high power distance and masculine. Thus, for such dimensions there would not be a “better” culture for innovation.

Table 2. Linear Regression Models.

	Hypothesis	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Const.		23.992***	-27.612***	-13.900*	-21.067***	-26.906***	-18.920***	-25.153***	-28,053***	-8,721***
HDI		-	82.4821***	73.5149***	67.2823***	82.3906***	84.2289***	72.8896***	82.0030***	54.6459***
PDI	-	-0.0944	-	-0.1051**	-	-	-	-	-	-0.0304
IDV	+	0.2016***	-	-	0.1343***	-	-	-	-	0.0872**
MAS	+	-0.0472	-	-	-	-0.0129	-	-	-	-0.0288
UAI	-	-0.0777**	-	-	-	-	-0.1549***	-	-	-0.1274***
LTO	+	0.3069***	-	-	-	-	-	0.1196***	-	0.1827***
IVR	+	0.1347***	-	-	-	-	-	-	0.0179	0.0733**
R^2		0.7240	0.6986	0.7209	0.7364	0.6990	0.7730	0.7396	0.6996	0.8584
R^2 ajust.		0.6996	0.6945	0.7132	0.7291	0.6907	0.7667	0.7323	0.6913	0.8436

The symbols *, **, and *** represent the significance of 10, 5, and 1% respectively.

Conclusion

Of the six hypotheses presented, four were validated (H_2, H_4, H_5, and H_6) based on the analyses. Individualism, long-term orientation and indulgence dimensions have a positive influence on countries' innovation. Although, there is a negative relationship between uncertainty avoidance and innovation.

There may be restrictions on the use of a composite index as a proxy for innovation, as every index has a conceptual bias. Thus, future research is suggested with different proxies for the ability to generate innovation in countries and different cultural approaches to expand the theme.

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