DOI: 10.20472/IAC.2019.049.011

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THE IMPORTANCE OF CULTURE FOR THE DEVELOPMENT OF NATIONS: A COMPARATIVE BETWEEN DEVELOPED COUNTRIES AND EMERGING MARKETS

Abstract:

The paper evaluates the influence of cultural aspects on innovation, comparing emerging markets to developed countries. The assumption that guide the paper is that individualistic nations are risk-takers and tend to show higher innovation rates; whereas countries whose relations are more hierarchical, and therefore with high power distance, tend to be less innovative. It was conducted a multivariate data analysis from 56 nations, divided into developed and emerging countries, according to the International Monetary Fund criteria, that defines 36 countries as "advanced economies". The results indicate that confidence in population is related to a country's degree of innovation. Nations with greater trust between individuals who are related tend to have a higher innovation index, while, on the other hand, countries in where people tend to have greater confidence in their neighborhood and community, have a lower chance of being innovative.

Keywords:

Innovation, Culture, Emerging Markets, Global Innovation Index (GII)

JEL Classification: F00, F20

Introduction

Several studies demonstrate that business performance is better when management practices are consistent with the national culture (Newman a& Nollen, 1996). Among these studies, international researches stand out linking national culture and innovation in developed countries, such as Shane (1993), Everdingen and Waarts (2003), Kaasa (2013) and Newman and Nollen (2015). However, the research on the topic is still incipient for emerging markets. Some authors get deeper into the subject, as Gasparindo (2014); Scarpin and Machado (2012); Machado and Vasconcelos (2007), but their studies are restricted to a sector or a country.

The aim of this paper is to determine how cultural aspects can influence the innovative capacity of a country and to analyze if the relationship between cultural dimensions and process innovation is the same for emerging market as it is for developed countries. Therefore, this study also expects to evaluate the influence of cultural aspects in innovation in emerging markets compared to developed countries. The assumptions that guides this article are that nations that are more individualistic and take risks tend to show higher innovation rates; whereas countries whose relations are more hierarchical, and therefore with high power distance, tend to be less innovative.

In order to confirm the previous assumptions, it was conducted a multivariate data analysis from 56 nations, divided into developed and emerging countries, according to the International Monetary Fund criteria, that defines 36 countries as "advanced economies". Importantly, it was not the criterion of HDI, Human Development Index, to avoid selection bias and endogeneity problems, as this variable is already contained in the Global Innovation Index (GII). So, we will cross the Global Innovation Index (2018) and the most recent foundations of the World Value Survey (2010-2014).

As a practical contribution, it is expected that this article illustrates and measures the impact of cultural variables to the innovation of a country and identifies determinants and other variables that impact on the development of innovative companies. It stands out as an academic contribution the pioneering analysis of the role of cultural difference between emerging and developed markets. Through this association between culture and innovation, it is expected to identify cultural dimensions that favor the creation and diffusion of innovation.

Literature Review

National Culture

National Culture is an abstract and quite complex concept (Barber & Badre, 1998) which may have many different definitions. This complexity can be reflected on the fact that Alfred Kroeber and Clyde Kluckhohn created a list of 164 definitions of culture found in the book “A Critical Review of Concepts and Definitions” (1952).

Specifically, in relation to national culture, Hofstede (1973) has developed a model of cultural dimensions measuring values related to work in different countries. Hofstede concluded that the differences between company’s headquarters and international branches were a result of the employees’ culture. Hofstede (1973) defined culture as "the collective programming of the mind distinguishing the members of one group or category of people from others”. According to Hofstede (2011) differences in the leaders’ way of thinking and their followers should be considered when seeking workable solutions to be applied worldwide. These differences are explained by differences in patterns of thought, feeling and potential action that every human being carries, and which are the result of continuous learning.

Different nations have different cultures, which derive from the diversity in institutions, such as governments, laws, associations, religious communities, school systems and family structures. And so, it is expected to have different ways of thinking, feeling and acting between individuals of different nations. In order to designate the dimensions of the different cultures, Hofstede (2011) used the following categories:

a) power distance;
b) individualism versus collectivism;
c) masculinity versus femininity;
d) uncertainty avoidance
e) long-term orientation
f) indulgence

With these six dimensions, Hofstede (2011) produced a model of differences between national cultures. Each country has a specific outcome in each dimension. In this paper,

only three categories were chosen: power distance, individualism and uncertainty avoidance.

The power distance dimension can be defined as " the degree to which the less powerful members of a society accept and expect that power is distributed unequally. The fundamental issue here is how a society handles inequalities among people. People in societies exhibiting a large degree of Power Distance accept a hierarchical order in which everybody has a place, and which needs no further justification. In societies with low Power Distance, people strive to equalize the distribution of power and demand justification for inequalities of power" (Hofstede, p. 42, 2003). The lower power distance index a country has, the lower is the dependency of the subordinate in relation to its immediate chief.

Individualism characterizes societies in which the ties between individuals are unsteady. People in individualistic societies tends to concern and take care of themselves and their immediate family. In opposite, collectivism, characterizes societies in which people are integrated in strong and cohesive groups, with unquestioning loyalty and expect the members of those groups to look after them. The degree of individualism varies within each country and between countries.

Finally, the uncertainty avoidance dimension (UAI) refers to the degree of concern of its inhabitants when exposed to unknown or uncertain situations. “The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behavior and are intolerant of unorthodox behavior and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles” (Hofstede, 2011).

The National Innovation Systems (NIS)

Innovating in an increasingly competitive and globalized scenario becomes a matter of survival and plays a fundamental role to economic development and growth of organizations and countries. When facing the economical dynamics in contemporary societies, technical progress is essentially fundamental, and innovation is a way to take a big step towards the achievement of competitive advantages whose impact not only affects the economy of a country but is also able to promote changes in society.

For Cassiolato and Lastres (2005), countries that were able to define and implement new strategies to strengthen and expand its scientific, technological and industrial policies have achieved better results in terms of use of the opportunities presented. According to these authors, it is through the mobilization of procurement processes and use of

knowledge and production that the innovation capabilities become part of the development strategies, structured from "innovation systems", which refer to:

> "... a group of firms and other actors who implement new products, new processes, and new forms of organization. This definition focuses on innovation as an interactive process, occurring among and between firms and other actors, embedded in a socioeconomic and political context. Hence, the most fundamental characteristic of an innovation system is the interaction among actors."

For Bessant and Tidd (2009), innovation is not an individual activity and in order to make it work it is essential to have the work of many participants, what requires different organizations to be connected and the complex development and use of each network. The importance of knowledge interactions for innovation was highlighted in the literature on innovation environments, knowledge spillovers, innovation networks and innovation systems (Tödling; Lehner; & Kaufmann, 2009).

Innovation systems should facilitate the flow of knowledge and information between the key players in the innovation process, thus determining the rate and direction of technological learning (Lundvall, 2007). Therefore, there should be channels of interaction between the components of innovation systems, and especially the interaction between existing knowledge in Innovation Systems.

Lundvall (1985) was the one who introduced this concept of Innovation System (without the national adjective) and Chris Freeman (1987) is responsible for the use of national adjective for the purpose of international comparisons between national innovation management styles (Lundvall et al., 2002).

In the literature there are several concepts for National Innovation System (NIS). Metcalfe (1995) refers to NIS as a system of institutions interconnected to create, store and transfer the knowledge, skills and artifacts that define new technologies. Freeman (1988) portrays him as organizational and institutional structures of support to technological changes, which have predominantly national character. For Coole, Uranga and Etxebarria (1998), the NIS is a network of private organizations and institutions in a sovereign state, whose activities and interactions initiate, import, modify and diffuse new technologies and organizational models. Niosi (2002) conceptualizes this issue as a set of interrelated institutions, and its core formed by those institutions that produce diffusing and adapt new technical knowledge, be they businesses, industries, universities and government agencies. According to Plonski (2005), National Innovation System (NIS) is a network of public and private institutions whose activities and interactions use, import,

modify and diffuse new technologies. Carlsson (2006) considers it as a set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. Since Casali et al. (2010), defines it as an institutional arrangement between the agents in a given country - firms, universities, research institutes, financial institutions, government - that drives the technological development of this country. To Llorens (2008), an innovation system (territorial) consists of institutions, public and private, that produce systemic effects to encourage local businesses to adopt rules, expectations, values, attitudes and common practices, fostering a culture of innovation. These processes occur due to the interaction between users and producers of knowledge, which creates learning through interaction.

According to Lundvall (2007), the study of the National Innovation System (NIS) focuses on the key components of the systems, such as private companies and public organizations, and investigates their mutual interactions and relationships with the social and institutional context in which the system is integrated. Besides, the approach of innovation systems emphasizes the importance of interaction between companies, public research institutions and technology policy for successful innovation (Freeman, 1987; Lundvall, 1985, 1992; Nelson, 1993; & Schartinger et al., 2002).

Moreover, the National Innovation System (NIS) in which a company operates is of great importance, since it influences decisively in the direction and intensity of the own innovation activities defining your choice spectrum in dealing with the opportunities and threats, influencing therefore its innovation strategy (Tidd; Bessant, Pavitt, 2008).

The Impact of Culture on National Innovation Systems (NIS)

Although research and development (R&D) are an important input, the innovation process is further influenced by many other internal and external environmental factors. In order to have an innovative environment, the country's culture plays an important role, ie: shared values, beliefs and behaviors.

According to Cassiolato and Lastres (2005), the innovative capacity of a country or region is seen as a result of the relations between economic actors, political and social, and reflect their own cultural and institutional conditions. For them, from the end of the 60s, the innovation has come to be seen not as an isolated act, but as a learning process non-linear, cumulative specific to the locality and shaped institutionally.

Michael Porter (1999) acknowledged that culture influences economic development and competitiveness but stressed that globalization includes cultural transmission that will tend to homogenize culture and make it easier for countries to overcome cultural and geographic disadvantages. According to Harrison and Huntington (2000) “there is a

powerful link between cultural values and the political - and economic - performance of nations." They consider culture capital as "not only the explicit articulations of culture like music, language, and ritualistic tradition but also attitudes and values that are linked to innovation".

Therefore, the authors reinforce the idea that "there are sets of beliefs and attitudes that are either pro-innovation and create the conditions for prosperity, or anti-innovation." For Harrison and Huntington (2000), "if parents and children can create sustainable routines, the cultural basis for change, new competencies, and innovation is present. Without this, no intervention is likely to succeed."

Since 'individualism' is measured by Hofstede (2011) as "a preference for a looselyknit social framework in which individuals are expected to take care of only themselves and their immediate families", it supports the following first hypothesis.

H1: The more individualistic the nation is, the higher its innovation rates.

The second hypothesis is based on an argument from Harrison and Huntignton (2000) that explains the lack of innovation in Angola. According to the authors, Angola is "less open to change than it should be" and "one might attribute their behavior to fatalism, a reverence for the past when things were better, blind pride, and an accompanying lack of openness that stands in the way of learning and innovation."

H2: Nations with lower risk aversion rates have higher innovation rates.

According to Grondona (1999) "the questioning mind is the one that creates innovation" and, according to Harrison and Huntignton (2000), "a more highly educated work-force stimulates a higher rate of innovation, and higher rates of innovation yield the ability to sell increasingly complex goods and services", leading to the idea of the third hypothesis:

H3: Countries whose relations are less hierarchical (low power distance) tend to have higher innovation rates.

The paradox of economic development is that economic values are not enough to ensure it. Economic development is too important to be entrusted solely to economic values. The values accepted or neglected by a nation fall within the cultural field. We may thus say that economic development is a cultural process. (Harrison & Huntignton, 2000).

According to Grondona (1999), there is “a typology of development-prone and development-resistant cultures” and “development or underdevelopment are not imposed on a society from outside; rather, it is the society itself that has chosen development or under development.” The arguments above contributes to the fourth and last hypothesis:

H4: The impact of national culture in the global innovation index is positive for developed countries and negative for emerging countries.

METHODOLOGY

Data source and sample

To measure the influence of culture on the country’s innovation level, the data was extracted from the database from The Global Innovation Index (2018) and the World Value Survey (2015). The answers collected from the questionnaire of the World Value Survey (2010-2014) are based on the criteria used by Berry et al. (2010) to define the construct "cultural distance". In this paper, in order to rank the countries on the development level, it was used the parameterization carried out by the International Monetary Fund (2014).

In order to maximize the size of the sample and to consider different cultural styles that cover both emerging and developed countries, it was considered only those countries which had concomitantly observed data to both databases: Hofstede Cultural Dimensions from World Value Survey (WVS, 2010-2014) and the Global Innovation Index (GII, 2018). Countries are available on the WVS indicators but were not classified in the global innovation ranking (or vice versa) were excluded from this sample, which represented a total of 86 exclusions. Thus, the final sample was composed of 55 countries with complete data for the analysis of culture as a possible impact factor to the overall degree of innovation of nations.

Definition of variables and Structural Modeling

In order to build a model that relates culture with innovation and involves the effects of Hofstede cultural dimensions on the overall degree of innovation of countries, this paper used the ranking published in The Global Innovation Index (GII) in the year 2018 as a function of the variables "Individualism", “Uncertainty Control" and “Power Distance" - dimensions that compound the construct of "cultural distance" defined by Berry et al. (2010), from data collected from the base of the World Value Survey (WVS).

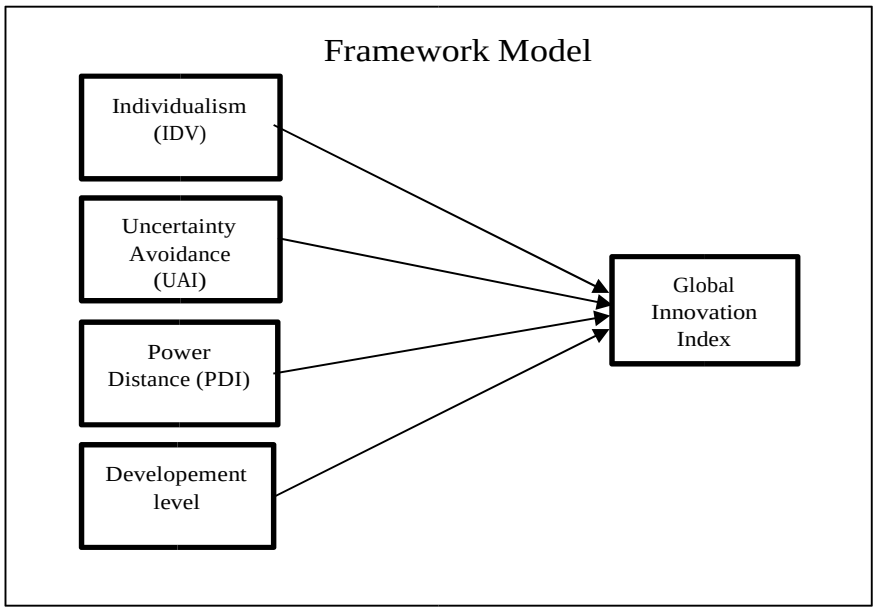
In this paper, we have considered the following observable variables:

a) Dependent Variable: Global Index GII Innovation (2018);

b) Independent variables: measures of cultural dimensions composed by the WVS questionnaire responses (2010-2014): (i.) individualism; (ii.) power distance; (iii.) uncertainty avoidance;

c) Dummy variable: level of development of the country, according to the IMF (2014).

FIGURE 1: Framework model representation



Source: Self-made figure.

For the selection of WVS questions to the composition of the measures of cultural dimensions, it was used the criteria established by Berry et al (2010):

a) Uncertainty aversion: variables were selected based on their correspondence to "trust in people" and "security and stability in the work."

Therefore, it was filtered (by title) only questions that contained the words "trust" and "job", resulting on the following variables:

V24 - {Most people can be trusted}

V102 - {How much you trust: Your family}

V103 - {How much you trust: Your neighborhood}

V104 - {How much you trust: People you know personally}

V105 - {How much you trust: People you meet for the first time}

V106 - {How much you trust: People you meet for the first time}

V107 - {How much you trust: People of another nationality}

V181 - {Worries: Losing my job or not finding a job}

b) Individualism: variables were selected based on their correspondence to "independence" and the "role of government".

In order to do that, it was filtered (by title) the questions that contained the words "independence" and "government", resulting on the following variables:

V12 - {Important child qualities: independence}

V233 - {Nature of tasks: independence}

V98 - {Government responsibility}

V115 - {Confidence: The government (in your national's capital)}

c) Power Distance: selected variables corresponding to "obedience" and "respect for authority."

In order to do that, it was filtered (by title) the questions that contained the words "obedience" and "respect", resulting on the following variables:

V21 - {Important child qualities: Obedience}

V69 - {Future changes: Greater respect for authority}

Estimation method

In order to verify the relationship between national culture and innovation of nations, we have considered the figures from three cultural dimensions of Hofstede (from WVS), expressed in the theoretical model of Figure 1 and the countries' development level, applied to indexes of global innovative capacity of countries.

The research method was based on a quantitative analysis using the statistical method of multivariate regression data. The databases used were secondary data from The Global

Innovation Index (2018) and the World Value Survey (2015). To express the level of development of the countries, it was created a dummy variable considering "zero" for emerging and developing countries and "one" for developed countries. All data were normalized, and the regression analysis was performed by Microsoft Excel tool.

Results

The multivariate regression analysis was performed through Excel Software. Figure 2 represents the main results from the regression.

FIGURE 2: Multivariate regression results of standardized databases of The Global Innovation Index (2015) and the World Value Survey (2015)

Estatística de regressão	
R múltiplo	0,830750465
R-Quadrado	0,690146335
R-quadrado ajustado	0,570971848
Erro padrão	0,650481197
Observações	55

ANOVA

	gl	*SQ*	*MQ*	*F*	*F de significação*
Regressão	15	36,75518809	2,450345873	5,791057759	0,000005
Resíduo	39	16,5019057	0,423125787		
Total	54	53,25709379			

	Coeficientes	*Erro padrão*	*Stat t*	*valor-P*	*95% inferiores*	*95% superiores*
Interseção	-0,09951551	0,119305386	-0,834124205	0,409291156	-0,340833431	0,141802411
V21	-0,11431832	0,137135162	-0,833617861	0,409573062	-0,391700368	0,163063727
V69	-0,179166078	0,13744585	-1,303539378	0,200033517	-0,457176552	0,098844395
V24	0,058391007	0,144655802	0,403654788	0,688671383	-0,23420297	0,350984985
V102	-0,080100018	0,147008065	-0,54486819	0,588946627	-0,377451897	0,21725186
V103	-0,549102955	0,18078268	-3,037364832	0,004242029	-0,91477044	-0,183435469
V104	0,438932491	0,156706449	2,800985498	0,007887672	0,12196378	0,755901203
V105	-0,166792505	0,187069339	-0,891607925	0,378071252	-0,545175958	0,211590948
V106	-0,118718788	0,243869778	-0,48681222	0,629116236	-0,611991974	0,374554398
V107	0,113834089	0,277415285	0,410338203	0,683803497	-0,447291288	0,674959466
V181	-0,123720447	0,120720775	-1,02484802	0,311749917	-0,367901263	0,120460368
V12	0,083181579	0,115385131	0,720903796	0,475268121	-0,150206878	0,316570035
V233	0,038319782	0,118089994	0,32449643	0,747296367	-0,200539778	0,277179341
V98	-0,039810951	0,129206729	-0,308118247	0,759632059	-0,301156229	0,221534327
V115	-0,050282473	0,109278941	-0,46012958	0,647978382	-0,271319994	0,170755048
Desenvolvido? 1 (Sim) 0 (Não)	0,371373762	0,358174093	1,036852662	0,306190822	-0,353101724	1,095849248

Source: Self-made table based on data researched

R	R-sq	p-value
0.8308	0.6901	0.0000

The resulting regression analysis of data is statistically significant (F = 0.0005%) and, according to the calculated R-squared, the model's power of the explanation is 69%,

which means that the dependent variable (innovation) is a linear combination of the three cultural dimensions: Power Distance-PDI; Individualism-IDV and Uncertainty Aversion - UAI.

It can be observed that only two issues are related to the global innovation index of a country and they are both related to confidence issues, within the construct of the cultural dimension "Uncertainty Aversion-UAI". They are:

V103: "How much you trust your neighborhood?"

V104: "How much you trust people you know personally?"

In the first case (V103), the relationship between trusting in the neighbor and innovation level is negative (coefficient = -0.54), indicating that the more the country's population relies on the neighborhood, the lower is the individual's innovation propensity in the country.

On the other hand, considering the second finding (V104), the relationship between trusting in someone you know in person and innovation level is positive (coefficient = + 0.438), meaning that the more people trust the ones they know personally, the greater is country's propensity to innovate.

The assumptions related to the dimensions Power Distance-PDI and Individualism-IDV as well as the degree of development of a country, were not statistically proven in this analysis.

DISCUSSION AND FINAL CONSIDERATIONS

Although the hypotheses H1, H2 and H4 were not confirmed, the regression showed that confidence in the population is related to the degree of innovation of a country, as the third hypothesis (countries whose relations are less hierarchical have higher innovation rates) was confirmed.

The results indicate that nations in where there is a greater trust between individuals who are related tend to have a higher innovation index, while, on the other hand, countries in where people tend to have greater confidence in their neighborhood, have a lower chance of being innovative.

The ideal experiment would be to analyze the data collected from all countries over the last 50 years, in order to capture behavioral changes of different generations. Unfortunately, however, there is insufficient data to analyze this evolution.

Future studies could consider the improvement of this statistical analysis considering periods of greater or lesser uncertainty of the selected countries in order to relate the UAI index of with economic context of the year analyzed. Another idea for future study is to

deepen the analysis of the relationship between trust and innovation in networks and global supply chains where countries are placed strategically.

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