Journal of Business Economics and Management
ISSN 1611-1699 / eISSN 2029-4433
2019 Volume 20 Issue 4: 777–797
https://doi.org/10.3846/jbem.2019.10180

CULTURE'S IMPACT ON ENTREPRENEURSHIP & INTERACTION EFFECT OF ECONOMIC DEVELOPMENT LEVEL: AN 81 COUNTRY STUDY

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Received 19 December 2018; accepted 15 April 2019

Abstract. This research has two aims. The first one is to determine how and to what extent the national cultural characteristic of a country plays a role in her entrepreneurship success. The second one is to determine whether culture and economic development levels interact with each other on influencing entrepreneurship success. A consecutive five-year longitudinal study, covering 81 countries is conducted. Longitudinal Random Effect Regression Analysis is used to determine the effects of culture on entrepreneurship rates. Data regarding the cultural dimensions indexes of the countries is obtained from Geert Hofstede website and the entrepreneurship rates from the annual reports of the Global Entrepreneurship and Development Institute. The interaction effect of cultural dimensions and economic development levels on entrepreneurship is analyzed by treating the economic development level is the interacting variable between cultural dimensions and entrepreneurship rates. Economic development levels of the countries are measured by GDP per capita, figures obtained from the World Bank. The findings are that the cultural dimensions Individualism, Long Term Orientation, and Indulgence vs. Restraint influence the entrepreneurship rate in a supportive manner, whereas Masculinity's impact is in a rendering manner. Other dimensions seem to have no significant effect. Although relevant cultural dimensions do interact with economic development levels, their interaction effects are small. This study has several unique contributions to the entrepreneurship literature, such as its longitudinal nature, using all Hofstede Dimensions, applying a very comprehensive entrepreneurship measurement scale, its huge sample size and containing an interactive analysis of culture and economic development level which is very rare in the literature.

Keywords: cross-cultural study, interaction of culture & economy, entrepreneurship, Hofstede dimensions.

JEL Classification: L26, M13, O57, R11.

Introduction

The late 20th century has witnessed an immense change in the course of economic history. This change has shaken all national economies of the World; the centrally-planned econo-

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mies of Eastern and Central Europe have gradually collapsed, and huge companies of the free-market Western economies have gone into a process of downsizing and reorganizing towards smaller, more energetic and flexible young firms. This new economic period is called "entrepreneurial economy" (Audretsch, Carree, & Thurik, 2001), and this period has caused radical changes in social, economic, cultural and technological environments (Coulibaly, Erbao, & Mekongcho, 2018). Subsequent research has shown that these changes do not occur in all developed countries concurrently and to the same extent (Audretsch, Thurik, Verheul, & Wennekers, 2002). The entrepreneurial success rate of the countries considerably varies across the world (Wennekers, 2006; Freytag & Thurik, 2007). Cross-country entrepreneurial research can, therefore, shed light on such variations.

Countries differ remarkably in their level of entrepreneurial activity (Minniti, Bygrave, & Autio, 2005; Kelley, Singer, & Herrington, 2012; Bogatyreva, Edelman, Manolova, Osiyevskyy, & Shirokova, 2019) and these variations are stable (Uhlaner & Thurik, 2007). The question of why some regions or countries are more entrepreneurial than others is a subject of high importance. The reason is obvious. Entrepreneurship has been considered as the primary determinant of innovation, technological progress, job creation, and economic dynamism and growth (Dheer, 2017; Kuratko, 2003; Schumpeter, 1934). Entrepreneurship has never been as important as today (Galvão, Mascarenhas, Gouveia Rodrigues, Marques, & Leal, 2017).

Despite the extensive research on the variability of entrepreneurial success across countries, variations among nations have not been adequately clarified by conventional economic and political approaches (Davidsson & Wiklund, 1997; Frederking, 2004). National culture has been ascribed to a considerable amount of such variations. Huntington (1997) argues that national cultures upon which civilizations are established out-rank current technological advances and thus providing lasting variations among cultures. Therefore, it can be assumed that culture can contribute to uncovering the variety of entrepreneurial success levels among nations (Hofstede et al., 2004, p. 104).

How national culture impacts the degree of entrepreneurial activity is a very old research question in entrepreneurship field and goes back to the studies of scholars from various fields (e.g., Schumpeter, 1934; Weber, 1930; McClelland, 1961). Although prior research has demonstrated a link between entrepreneurial activity and national culture, scholars have not reached an agreement on the explanation of the variations of entrepreneurial activity across cultures (Shane, 1996; McDougall & Oviatt, 2000; McGrath, MacMillan, & Scheinberg, 1992).

The hypothesized connection between culture and entrepreneurship activity has not been sufficiently established (see Hayton, George, & Zahra, 2002). Many questions are still waiting to be answered. There is no theoretical basis for the explanations beyond scattered approaches and partial connections. "The Black Box" of entrepreneurship is not opened yet (Fiet, 2002).

This paper aims to attempt to clarify some equivocal issues in the relevant entrepreneurship literature. Firstly, entrepreneurship is a multidimensional concept (Bula, 2012) and measuring it by the number of new ventures established (see Gartner, 1988; Shane, 2008) does not reflect the whole picture of it. It is argued that entrepreneurial initiatives can also emerge within organizations (Kuratko, 2007) i.e., in the form of corporate entrepreneurship (see Morris, Kuratko, & Covin, 2010). Additionally, entrepreneurship is not restricted to

business activities and may take different forms, including social entrepreneurship (Nicolás & Fernández-Laviada, 2018; Mair & Marti, 2006). A broader and inclusive conceptualization of entrepreneurship is needed to cover all its aspects.

Second, earlier studies have used certain aspects of culture to explain the entrepreneurial activity. Since culture can be thought as a system comprised of common values to members of the society (Hofstede, 2001), all components of this system, i.e., all cultural dimensions, should be included in the analysis with a holistic view.

Third, as Cacciotti and Hayton (2017, p. 407) have argued, the theoretical approach should include the time and also the level of economic development. Entrepreneurial research should be longitudinal in order to avoid temporal or conjectural fluctuations. The prosperity levels of the countries should also be taken into account since studies have furnished empirical evidence on the interaction effects (Wennekers, Van Wennekers, Thurik, & Reynolds, 2005).

Finally; an absolute lack of clarity may come out from the constraints in the methodology of the previous empirical cross-cultural studies. Many studies were conducted with a limited sample size of countries. Furthermore, sometimes the unit of analysis was a firm, the entrepreneur himself, or students instead of a nation. Most importantly, the measurement of entrepreneurial success has been usually the number of new ventures which may not be reliable data for some countries (see Hayton & Cacciotti, 2013).

This research attempts to eliminate above- mentioned gaps by analyzing 81 countries' entrepreneurial success for five continuous years, using the most inclusive definitions and measurement scales, with the new cultural dimensions recently added to the literature and taking into account the interaction effects. To achieve this goal. Longitudinal Random Effect Regression Analysis is used to determine the influence of culture on entrepreneurship rates. Cultural Dimensions Indexes data are obtained from Geert Hofstede website and the entrepreneurship rates from the Global Entrepreneurship and Development Institute publications. The interaction effect of cultural dimensions with economic development levels on entrepreneurship is analyzed by using the PROCESS® macro for SPSS, where economic development levels of the countries are measured by GDP per capita, figures are adopted from World Bank Databases.

This study is organized in the following way. In the next section, a conceptual framework is developed by performing a systematic analysis of scientific literature. Section 2 presents the entrepreneurship success rate measurement method. Section 3 is devoted to the development of empirical hypotheses. Section 4 covers the methodology, the data, variables, and data analysis. The results of the regression and interaction effect analyses are presented in Section 5. Finally, in Section 6, the main results of the study are discussed.

1. Influence of national culture on entrepreneurship

It is widely accepted that culture is a significant determinant of economic growth. Landes (1998, p. 516) indicates that the history of economic development proves the impact of culture. Weber (1930) was the first author to write about the relation between culture and economy (Harutyunyan & Özak, 2017). Up to today, a remarkable body of scholarly research

has been accumulated whose results suggest that national cultures significantly influence productivity, inventiveness, and innovation of the countries (Shane, 1992, 1993; Shane, Venkataraman, & MacMillan, 1995). Also, at the firm level, Hofstede (2001) points out that national culture influences different kinds of economic management behavior.

Entrepreneurship and its social ground go back Weber (1930) and Schumpeter (1934). They contend that the sources of entrepreneurial attitude and behaviors exist in the society's socio-cultural structure and value systems. Cultural and social norms are claimed to be the primary factors for the different levels of entrepreneurial activity across the nation (Minniti, Bygrave, & Autio, 2006) and a significant number of studies point out the particular relations between cultural indicators and entrepreneurial activity (Autio, Pathak, & Wennberg, 2013).

National culture exerts its influence mainly at two levels, one is on the individual, and the other one is on the societal level. In this study, institutions are approached as the products of national cultures since national culture and its values shape the structures of social, political and technical systems of the society which support or render entrepreneurship (Coulibaly et al., 2018). As Shapero and Sokol contend that the socio-cultural constituents entering into the embodiment of entrepreneurship are mostly seen at a person's own value system (1982, p. 83). A supportive culture with values, encouraging entrepreneurial orientations can shape an individual's cognitive schema and attitudes towards entrepreneurship (Krueger, Liñán, & Nabi, 2013). This encouraging set of values and beliefs influence the way individuals define their behaviors in terms of basic entrepreneurial traits, including risk-taking, productivity, independent judgment, and desire to become an entrepreneur (Hofstede, 2010; Mueller & Thomas, 2001; Hayton et al., 2002; Kreiser, Marino, Dickson, & Weaver, 2010) which is a complex process (Laffranchini et al., 2018). There is a substantial body of studies investigating the influence of culture on behaviors and attitudes related to entrepreneurship (e.g., Soares, Farhangmehr, & Shoham, 2007; Baughn & Neupert, 2003; Hechavarria & Reynolds, 2009; Suddle, Beugelsdijk, & Wennekers, 2010; Tiessen, 1997) and the findings of the studies suggest that national culture consistently manipulates various entrepreneurial attitudes.

Since culture can be defined as a complex social structure, consisting of knowledge, values, beliefs, art, morality, customs and habits possessed by the majority of the members of the society (Soares et al., 2007). Defined in this way, culture is a mental model (Au, Han, & Chung, 2018), members of a society share. A supportive culture is likely to form a basis for the legitimacy of entrepreneurial behavior and this social legitimization makes the entrepreneurial career more valued, and a supportive ecology is created. Therefore, more people will devote their efforts towards entrepreneurship (Etzioni, 1987). To sum up, culture not only impacts the behavior of the people but also has an important influence on the economic functioning of society (Dheer, 2017).

What is known that there is a link between national culture and entrepreneurial success, but questions about how and to what extent culture impacts entrepreneurial activities are not entirely answered (Caccioti & Hayton, 2017). The results of cross-country studies examining the influence of cultural dimensions are most of the time confusing and contradictory (Hayton & Cacciotti, 2013). It is a well- known fact that both entrepreneurship and culture are elusive, multi-dimensional phenomena which make them difficult to define. Furthermore, there is no agreed definition of the social institutions influencing entrepreneurial activity

which makes almost impossible to compare the studies (Bula, 2012; Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004; Ralston, Holt, Terpstra, & Kai-Cheng, 1997; Hui & Triandis, 1986). In addition to this, studies using time and economic development level as variables are scarce and this makes it almost impossible to draw a solid conclusion, regarding the unique factor impact of either type of element (Davidsson & Winklund, 1997). And usually, there are apparent methodological limitations regarding the numbers of the countries, analysis level, and measurement conceptualizations.

2. Global entrepreneurship and Development Institute

Global Entrepreneurship and Development Institute (GEDI) is a non- profit organization which enhances insight into the relations among entrepreneurial activity, economic development and wealth. It was established by an initiative of scholars from the LSE, George Mason University, University of Pécs and Imperial College London. The main financial funding source for the researches of GEDI is the European Union, The World Bank, and some various corporations and banks (Acs, Szerb, & Lloyd, 2018).

GEDI basically defines an entrepreneur as a person who has the perception to detect and evaluate an innovative opportunity (products and processes) and present the innovation to its potential consumers. This definition is highly similar to the description of Shane and Venkataraman (2000). GEDI definition of entrepreneurship covers only the "opportunity driven entrepreneurship", which positively influences economic development (Acs et al., 2018).

GEDI assesses the entrepreneurial success of the countries by an index published annually. The GEDI Index covers three crucial determinants of entrepreneurship, named as 3A's, entrepreneurial attitudes, abilities, and aspirations. Entrepreneurial Attitudes sub-index concerns with how a country thinks about entrepreneurship and asks questions like "Is it socially legal or legitimate?". Entrepreneurial Abilities sub-index is about abilities and competencies. The third sub-index Entrepreneurial Aspirations is about desires, ambitions, and motivations. The 3A's are constituted of 14 variables. These 14 variables have an individual and constitutional component, which correspond to the micro and macro aspects of entrepreneurship (Acs et al., 2018). The arithmetic mean of three sub-indexes is the country's overall entrepreneurial index. This approach is followed throughout this paper, and entrepreneurial success may be viewed as the harmonious combination of abilities, aspirations and attitudes since the personal traits, motivations, desires, the socio-cultural and institutional environments of the individual are among the main factors influencing entrepreneurship (Hofstede, 2011; Hayton & Caccioti, 2013; McGrath et al., 1992; Amiri & Mariami, 2012). GEDI methodology has been approved by academic peers and extensively disclosed in the media, including Forbes, The Economist, Financial Times, The Wall Street Journal and (Acs et al., 2018).

3. Hofstede's cultural dimensions and hypothesis development

Empirically identifying the different types of culture is the first step in designing a methodology in culture-based research. Among the different conceptualizations of culture (e.g. Bond et al., 2004; Hofstede, 1980; House et al., 2004; Inglehart, 1997; Schwartz, 1994). Hofstede's

conceptualization of culture has received the widest acceptance (Kirkman et al., 2006). In the field of culture and entrepreneurship research, Hofstede (1980, 2001) cultural dimensions approach is certainly the one most commonly adopted (Pinillos & Reyes, 2011).

Hofstede's conceptualization of culture consists of six dimensions which are; Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence vs. Restraint (Hofstede, 2001; Hofstede et al., 2010). All these six dimensions are used simultaneously as independent variables in this study.

3.1. Power distance

Power Distance indicates the degree of acceptance of unequal distribution of power and authority by the relatively less powerful individuals in a culture (Hofstede, 2001, p. 98). It shows the level of dependence or independence of people in a society. Power Distance is the measure of what extent inequality is accepted within a culture (Carayannis, 2013, p. 635).

Earlier studies examining the association between Power Distance and entrepreneurship have strongly argued that Power Distance is not conducive to entrepreneurship (e.g. Hofstede, 2001; Hayton et al., 2002; Mitchell et al., 2000; Shane, 1992). This argument based on the assumption that in countries which have a high level of power distance, less powerful individuals may regard entrepreneurship as an area restricted only to a higher class, so they are not alert for the opportunities. Additionally, they may not have the necessary skills and access to resources. There are contradictory arguments about the impact of Power Distance on entrepreneurship (i.e. Mc Grath et al., 1992; Hofstede et al., 2004), but among them, the Hofstede theory which states that Power Distance and desire for autonomy is negatively related (Hofstede, 2001) is more preferred. Since entrepreneurs are achievement-oriented, independent in nature individuals, the hypothesizes are arranged as follows:

H_{1a}: Power Distance negatively influences entrepreneurial attitudes;
H_{1b}: Power Distance negatively influences entrepreneurial abilities;
H_{1c}: Power Distance negatively influences entrepreneurial aspirations;
H_{1d}: Power Distance negatively influences overall entrepreneurial success.

3.2. Individualism and collectivism

Individualism is the degree of the looseness of the bond between the members of the society. In individualistic cultures, individuals are expected to take care of themselves or their family alone. Collectivism, on the other hand, refers to a society whose members are part of a united, cohesive group that protects from birth onwards in exchange for indisputable obedience. Individualism stresses self-sufficiency and self-control. People in individualistic cultures feel proud of their accomplishments and are motivated by their interests and objectives. On the other pole, individuals in collectivist cultures identify themselves with the group which provides safety to the members, encourages them to share and cooperate (Carayannis, 2013), and shape their behavior in accordance with group values (Bogatryeva, 2019).

Individualism, in many types of research examining the impact of culture on entrepreneurship, appears to be strongly facilitating entrepreneurship (Mueller & Thomas, 2001). This argument explains that individualistic societies create a more favorable environment for

entrepreneurship since dominant cultural values are more consistent with entrepreneurial inclinations. Therefore, entrepreneurship is perceived as more proper and appropriate (Morris et al., 1993; Pinillos & Reyes, 2011). The positive influence of individualism on entrepreneurship argument is supported by some empirical studies (i.e., McGrath et al., 1992; Mueller & Thomas, 2001), but there are also contradictory results in which collectivism supports entrepreneurship (i.e., Acs, Audretsch, & Evans, 1992; Wu, 2007). Recent studies, therefore, show that the effect of individualism on entrepreneurship is not certain.

In an interesting study on the impact of individualism by Pinillos and Reyes (2011), the authors argue that if the economic development level in a country is low or medium, individualism negatively influences entrepreneurship, and positively influence when the development is high. This study is an example of the interaction effects of economic development and culture on entrepreneurial success.

Individualistic cultures encourage entrepreneurship by emphasizing the identity of an individual rather than his/her society and therefore supporting typical characteristics of entrepreneurs such as high level of self- confidence, initiative, and courage. On the individual level, entrepreneurs struggle for high achievement (McClelland, 1961) and have a relatively high level of internal locus of control (Mueller & Thomas, 2001). Thus, it is hypothesized as follows:

H_{2a}: Individualism positively influences entrepreneurial attitudes;
H_{2b}: Individualism positively influences entrepreneurial abilities;
H_{2c}: Individualism positively influences entrepreneurial aspirations;
H_{2d}: Individualism positively influences overall entrepreneurial success.

3.3. Masculinity and feminity

Masculinity is the degree of separation of gender roles in society. In masculine cultures, the roles are clean-cut. Men are supposed to be confident, decisive, vigorous and involved in material things, while women are supposed to take care of the home- issues, the quality of daily life, to be prudent and caring. On the other pole, in feminine cultures the separation of the gender roles is not so clear, gender roles are sometimes overlaid. Masculinity and Feminity dimension indicates a culture's approach to success, appreciation, competitiveness, and affiliation. Cultures with a high level of masculinity tend to be oriented toward wealth, career, independence, and leave for work, whereas, in cultures with a low level of masculinity, individuals prefer to work to live with an emphasis on relationships and social interactions (Hofstede, 2001; McGrath et al., 1992). In the majority of studies on culture and entrepreneurship, researchers have hypothesized that the ideal entrepreneur would/should be high on masculinity (Hayton et al., 2002; Hofstede, 1980; Shane, 1992). This assumption has some empirical evidence (McGrath et al., 1992; Ahl, 2006; Gupta et al., 2009). On the other hand, Wu (2007) and Osoba (2009) claim that masculinity and entrepreneurial activity are not significantly related.

High-masculine cultures support entrepreneurial behavior from members of such societies are educated to be independent, strong, ambitious and they see failure as an indication of moderateness. In this type of cultures, achievement is associated with wealth and position

with self-assertiveness whereas successful career and independence being the dominant values. In feminine societies, on the other hand, it is highly possible that economic development is not the ultimate goal of society. However, a cordial, safe environment and cooperation are more important in such societies. With these arguments, it is hypothesized as follows:

H_{3a}: Masculinity positively influences entrepreneurial attitudes;
H_{3b}: Masculinity positively influences entrepreneurial abilities;
H_{3c}: Masculinity positively influences entrepreneurial aspirations;
H_{3d}: Masculinity positively influences overall entrepreneurial success.

3.4. Uncertainty avoidance

Uncertainty Avoidance indicates the degree of fear or anxiety, perceived by the member of a society in uncertain situations. In cultures with a high level of uncertainty avoidance, members of society feel uncomfortable when dealing with ambiguity and perceive uncertainty as a threat (Au & Chung, 2018). As a result, preferences lean toward greater systems with clear rules and procedures. Conversely, in cultures with low uncertainty, members are relatively more at ease with unfamiliar situations (Hofstede, 2001).

Tolerance of uncertainty and risk-taking is theoretically well connected. (Kreiser et al., 2010). Low uncertainty avoidance suggests a greater eagerness to set up unknown businesses (Hofstede, 2001, p. 164). Members of a society tend to be more entrepreneurial if the cultural atmosphere encourages the acknowledgment of uncertainty and risk. This argument has several empirical supports (e.g., Kreiser et al., 2010; McGrath et al., 1992; Osoba, 2009), however, there are some contradictory results as well (i.e., Acs et al., 1992; Wennekers et al., 2007). The opposite argument is that the restrictive business environment in high uncertainty avoidance countries could push an individual towards self-employment with entrepreneurship being the way to which innovative employee may attain their objectives (Wennekers et al., 2007).

Members of a low uncertainty avoidance culture are more likely to look for innovative ways of doing things, and they tend to take risks and take advantage of available opportunities which are identified in the environment they live in (Busenitz & Lau, 1996). Thus, a supportive ecology is created where the individuals will likely be more enthusiastic to become entrepreneurs. Thus, it is proposed that:

H_{4a}: Uncertainty Avoidance negatively influences entrepreneurial attitudes;
H_{4b}: Uncertainty Avoidance negatively influences entrepreneurial abilities;
H_{4c}: Uncertainty Avoidance negatively influences entrepreneurial aspirations;
H_{4d}: Uncertainty Avoidance negatively influences overall entrepreneurial success.

3.5. Long term orientation

Long Term Orientation, also known as Confucian Dynamism, encourage future-oriented virtues such as perseverance and thrift whose rewards hoped to be cultivated in the future. On the contrary Short Term Orientation emphasizes the virtues which are linked to the past and present, such as respect for customs, habits and pleasing social duties (Hofstede, Hofstede, & Minkov, 2010, p. 239). This dimension refers to the preferences leaning towards either a forward-looking perspective or a more historical and traditional perspective.

Some authors argue that this dimension and its Confucian cultural value content is strongly associated with the impressive economic development of South Asian countries starting in the second half of the last century (Hofstede, 2011; Hofstede & Bond, 1988; Ralston et al., 1997). Empirical support is not available on the impact of Long Term Orientation on entrepreneurship either positively or negatively. Some authors argue that there is a strong influence of this dimension on innovation (e.g., Van Everdingen & Waarts, 2003; Lin, 2009; Allred & Swan, 2004) which is a critical aspect of entrepreneurship. As entrepreneurship is a challenging, risky process oriented towards future goals and the entrepreneurs tend to have aspirations, vision, optimism, foresight, and imagination (Swierczek & Quang, 2004; Amiri & Marimaei, 2012), it is hypothesized that:

H_{5a}: Long Term Orientation positively influences entrepreneurial attitudes;
H_{5b}: Long Term Orientation positively influence entrepreneurial abilities;
H_{5c}: Long Term Orientation positively influence entrepreneurial aspirations;
H_{5d}: Long Term Orientation positively influences overall entrepreneurial success.

3.6. Indulgence vs. restraint

This sixth and newest dimension reflects the determinants of a measure of happiness or what the psychologists call "subjective well-being." Indulge is the degree of importance given by the members of the society on personal control of life, fulfilling human desires, enjoyment, and entertainment in daily life. It is about how personal life control is perceived by the members of the society. On the Indulgence pole of this dimension individuals feel comfortable when they spend money and entertain themselves in social activities or alone, whereas on the Restraint pole, various social norms and prohibitions restrain one's actions. Fulfilling human desires or entertaining activities together with a perception of life based on happiness search are looked at as somehow inappropriate (Hofstede, 2010, p. 281).

The literature suggests that there is a link between Individualism and the idea of happiness. Happiness is associated with a perception of control over one's life and a sense of freedom (Minkov, 2009, pp. 113-115). Since entrepreneurs have a high internal locus of control, personal value systems, desire to be economically independent, capacity for enjoyment and a pleasant personality (Swierczek & Quang, 2004; Amiri & Marimaei, 2012), it is stated that:

H_{6a}: Indulgence positively influences entrepreneurial attitudes;
H_{6b}: Indulge positively influences entrepreneurial abilities;
H_{6c}: Indulgence positively influences entrepreneurial aspirations;
H_{6d}: Indulgence positively influences overall entrepreneurial success.

There are arguments on the interaction of cultural dimensions with the economic development level on entrepreneurship (e.g. Pinillos & Reyes, 2011; Wennekers et al., 2005). But, the theory is weak and empirical studies are rare, therefore, the interaction effect analysis is run without any hypotheses.

4. Research methodology

4.1. Sample and data

This research covers 81 countries scattered on the six continents of the World. This sample is chosen randomly and it is intended to cover as many countries as possible with the required data available. The list of countries covered in this research is given in Appendix 1.

Data regarding the cultural dimension indexes of the countries are adopted from the website https://www.hofstede-insights.com/product/compare-countries/. The six cultural dimension indexes of the countries are listed on this website, indexes being between 0 and 100. Categorization of countries on cultural dimensions basis is achieved by the criteria obtained from G. Hofstede support team. Entrepreneurial data of the countries within the scope of this study is obtained from the annual reports of GEDI. GEDI provides 3 sub-indexes, namely attitudes (ATT), abilities (ABT), aspirations (ASP) and an overall Global Entrepreneurship Index (GEI). Scores lie between 0 and 100. This study makes use of the Institute's entrepreneurial data for the years between 2013 and 2017 inclusive. Data regarding the economic development levels of the sample countries is obtained from the World Bank Database, which is mainly based on GDP per capita of the sample countries. Cultural and economic categorization of the countries presented in Appendix 2.

4.2. Variables and model

The cultural dimensions of the countries are the independent variables, namely, PD, IND, MAS, UA, LTO and IVR for the cultural dimensions Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation and Indulge vs. Restraint respectively. The dependent variables are the entrepreneurial indicators of the countries in the sample, namely; ATT, ABT, ASP, and GEI; for the Attitudes, Abilities, Aspirations and Global Entrepreneurship Indexes respectively. GDPMEAN is the mean of Gross Domestic Product Per Capita values (in USD) between the Years 2013–2017 (inclusive). This variable is used as the interacting variable between independent and dependent variables.

4.3. Analysis

The analysis' first objective to determine to determine the direction and magnitude of the cultural dimensions' effects on the entrepreneurial indicators of the countries. A Longitudinal General Least Squares (GLS), Random Effect (RE) four regression analyses are run, using with STATA® since the dataset is longitudinal and the countries are randomly selected. The independent variables are the cultural dimensions, namely; PD, IND, MAS, UA, LTO, and IVR for all regressions. GEDI entrepreneurial indexes are the dependent variables, namely GEI, ASP, ATT, and ABT. The second step in the analysis is to check if there is an interaction between the influencing cultural dimensions and economic development level variable GDPMEAN on affecting GEI. This analysis is performed by using PROCESS® macro for SPSS®. In this analysis, cultural dimensions are independent variables. GEI is the dependent variable and GDPMEAN acting as moderator.

5. Results

5.1. Longitudinal regression results

The detailed results of Longitudinal GLS RE Regression analyses are presented in the Appendix. Regression models are all satisfactory ($\forall\chi^2$: $98.78 \leq \chi^2 \leq 200.30$; $\forall$p: p<.005) and overall $R^2(R_0^2)$ values are in the interval ($.550 \leq R_0^2 \leq .685$). Below are the explanations for the longitudinal GLS RE regression analyses.

The unstandardized regression coefficients (b) for the independent variable PD have negative signs for all dependent variables which indicate a negative effect. But they are not significant (p>0.05), except for the dependent variable ABT (p = 0.036). Thus, the hypothesis regarding the influence of PD on ABT, H_{1b} is supported, while H_{1a}, $H_{1c,}$ and H_{1d} are rejected. Power Distance seems to have almost no impact on entrepreneurial indicators except its negative influence on ABT.

The regression coefficient values for the variable IND have positive signs, and all are significant ($\forall$p: p< 005). Thus, the hypotheses about this dimension H_{2a}, H_{2b}, $H_{2c,}$ and H_{2d} are all supported. Individualism has a positive impact on every aspect of entrepreneurial behavior.

The regression coefficient values for the independent variable MAS have negative signs and all are significant (p<0.05), except for the dependent variable ASP (p = 0.453). MAS seems to have a negative influence on GEI, ABT, and ATT but no significant effect on ASP. All of the hypotheses regarding this dimensionH_{3a}, H_{3b}, $H_{3c,}$ and H_{3d}, assuming masculinity is a positive factor for entrepreneurship, are all rejected. On the contrary, Masculinity has a clear negative effect on entrepreneurship, since three out of four entrepreneurial indicators are affected by Masculinity in a rendering direction.

The Uncertainty Avoidance dimension variable UA has regression coefficient values which have positive and negative signs. None of the regression coefficients are significant ($\forall$p: p> 005). UA does not have any significant effect on entrepreneurial indicators. Thus, the hypotheses H_{4a}, H_{4b}, $H_{4c,}$ and H_{4d} are rejected.

The Long Term Orientation variable LTO has positive regression coefficient values and they are significant ($\forall$p: p < . 005). LTO has a definite positive effect on all entrepreneurial indicators. Thus, the hypothesis regarding this dimension H_{5a}, H_{5b}, $H_{5c,}$ and H_{5d} are all supported.

The final independent variable IVR has regression coefficient values with positive signs, and they are significant (p < 0.05) except for the dependent variable ASP (p = 0.084). It can be concluded from these results that IVR has a significant positive effect on GEI, ATT, and ABT, but not on ASP. Thus, the hypothesis H_{6a}, H_{6b}, and H_{6d} are supported, whereas H_{6c} is not supported. The summary of the GLS RE Longitudinal Regression results is presented in Table 1.

The longitudinal regression results are cross-checked with a different approach, with multiple linear regressions for each year by using IBM SPSS® since there may be some inconsistencies due to temporal, conjectural or alike effects, and highly similar results have been obtained.

Table 1. Effects of cultural dimensions on entrepreneurship, summary

Cultural Dimensions	Effect on entr. attitudes (ATT)	Effect on entr. abilities (ABT)	Effect on entr. aspirations (ASP)	Effect on overall entr. success (GEI)
Power Distance	No significant effect	Negative effect	No significant effect	No significant effect
Individualism	Positive effect	Positive effect	Positive effect	Positive effect
Masculinity	Negative effect	Negative Effect	No significant effect	Negative effect
Uncertainty Avoidance	No significant effect	No significant effect	No significant effect	No significant effect
Long Term Orientation	No significant effect	Positive effect	Positive effect	Positive effect
Indulgence vs. Restraint	Positive effect	Positive effect	No significant effect	Positive effect

5.2. Interaction analysis results

The results of the PROCESS® macro interaction analyses of IND, MAS, LTO, and IVR individually with GDPMEAN is presented in Table 2. The interaction effect of IND with GDPMEAN, IND*GDPMEAN is significant ($F = 17.897$, $df1 = 1$, $df2 = 401$, $p < 0.05$) but the contribution of this interaction to the explained variance is very small ($\Delta R^2 = 0.011$). For the interactions MAS*GDPMEAN and LTO*GDPMEAN, similar results are obtained. Interaction is significant, but R^2 change is negligible ($F = 4.848$, $df1 = 1$, $df2 = 401$, $p < 0.05$, $\Delta R^2 = 0.004$; $F = 45.890$, $df1 = 1$, $df2 = 401$, $p < 0.05$, $\Delta R^2 = 0.033$ respectively). The interaction effect IVR*GDPMEAN is not significant ($F = 0.987$, $df1 = 1$, $df2 = 401$, $p > 0.05$).

Therefore, we can conclude that some cultural dimensions do interact with economic development levels on impacting entrepreneurship, but the effects generated are quite small.

Table 2. Results of interaction analyses

Interaction terms	F	df1	df2	p	ΔR^2
IND*GDPMEAN	17.897	1	401	0.000	0.011
MAS*GDPMEAN	4.848	1	401	0.028	0.004
LTO*GDPMEAN	45.890	1	401	0.000	0.033
IVR*GDPMEAN	0.987	1	401	0.320	0.000

6. Discussion

In this longitudinal study, culture has been considered culture as a national level variable since it is empirically supported that culture is a valid concept (Minkov & Hofstede, 2012) but this study explicitly reveals that culture is also a very complicated concept and cannot be explained by simple characteristics. Prior to hypothesis formulation, the relevant theories and empirical studies in the field of entrepreneurship and culture have been examined, yet profoundly different and surprising results have been obtained.

The cultural dimension of Power Distance is generally associated with entrepreneurship in a rendering manner. But the results indicate that the effect is negligible. This may arise from the truth that high power distance countries are also aware of the importance of entrepreneurship and define their policies accordingly. Another explanation may be that members of high power distance societies may desire to become entrepreneurs to achieve their aspirations (dissatisfaction hypothesis). Relevant theory and empirical studies indicate that Individualism is a supportive dimension for entrepreneurship. The results obtained corroborate previous studies.

The masculinity dimension is generally thought to influence entrepreneurship in a positive manner, but the results obtained indicate just the opposite. Masculinity seems to render entrepreneurship. One possible explanation is that strict sharing of the roles in high masculinity countries may lead to putting almost half of the country's population away from professional business life. This attitude may limit society to use human resources effectively. Another explanation may be that, with the new global economy, customers are more conscious about the products, services, market, prices, and competition. They have much more options to choose from. So they also expect quality, tenderness, and care in customer relations which indeed are feminine values.

Uncertainty Avoidance is considered to be negatively associated with entrepreneurship because risk and uncertainty are generally related to the nature of entrepreneurship. The results indicate that the Uncertainty Avoidance dimension is not significant in any aspect of entrepreneurship. One explanation may be that individuals and business owners find ways to minimize the risk in their entrepreneurial decisions in this type of countries (e.g. Corporate Entrepreneurship, spin-off's, joint ventures, and angel investors).

It has been hypothesized that Long-Term Orientation is supportive of entrepreneurship, and the results obtained are as expected. Since entrepreneurs are "dreamers" in a sense, they are naturally long term oriented. Although Indulge vs. Restraint Dimension is the newest and least studied dimension, its effect on entrepreneurship is quite remarkable and evident. This dimension is thought to be associated with individualism and the search for happiness which is a state that may be achieved by entrepreneurship.

The results of the interaction analysis imply that the cultural dimensions Individualism, Masculinity, and Long Term Orientation interact with economic development levels of the countries on impacting the entrepreneurship success rates but the interaction effect is not striking. Both culture and economic development level are important determinants of entrepreneurship, but they do not seem to be interacting with each other.

Conclusions

This study has clearly shown that culture impacts the entrepreneurship ecology in a country with very surprising results. The Cultural Dimension Power is generally considered to render entrepreneurship the findings of this study show that it has no significant effect. The cultural dimension Masculinity is accepted as a positive factor, but the findings of this study indicate just the opposite. The Uncertainty Avoidance dimension is generally taught to render entrepreneurship, but the findings indicate that it has no significant effect, and finally the

new cultural dimension Indulgence has been found to be strongly supporting entrepreneurship. Findings on the cultural dimensions Individualism and Long Term Orientation support previous findings that these dimensions support entrepreneurship. There has not been found any evidence of a strong interaction effect of culture and economic development on entrepreneurship.

There are several unique contributions to the entrepreneurship literature in this research. One of them is the longitudinal study which spans through five consecutive years. Second, a multidimensional concept of culture is used, and the relatively new dimensions -e.g., Indulgence vs. Restraint- are included in the analysis together with the relatively older ones. Another contribution is that its sample covers 81 countries which are more comprehensive than previous studies. The GEDI measurement method of entrepreneurship success encompasses all aspects of entrepreneurship and empirical studies using this method are scarce. As one factor cannot explain a complex and elusive phenomenon like entrepreneurship, interaction with economic development level parameters is also analyzed. As in almost every study, this study has also certain limitations. One of them is the time period, which is limited to five years, is not well enough for a longitudinal study. The second one is the size of the sample. Data regarding culture and entrepreneurship is not available for many countries. As more data is accumulated in time, this study may be repeated and more precise and detailed results may be obtained. Finally, although there are good reasons to structure the study on the Hofstede approach for dimensionalizing a national culture, this approach is not the sole alternative and has its own limitations. The results obtained may be somehow contradictory and provocative for further study. It is believed that this paper will fill some crucial gaps in the entrepreneurship field and open new avenues for scholars of entrepreneurship, practitioners, and policymakers.

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APPENDIX 1. Results of GLS RE Longitudinal Regression Analysis

Variables	Dependent variable: GEI				Dependent variable: ATT				Dependent variable: ABT				Dependent variable : ASP			
Independent variables	b	SE	z	p	b	SE	z	p	b	SE	z	p	b	SE	z	p
PD	–.135	.083	–1.61	.107	–.100	.087	–1.15	.250	–.168	.079	–2.10	.036	–.138	.106	–1.30	.194
IND	.426	.078	5.42	.000	.406	.081	4.96	.000	.429	.074	5.73	.000	.445	.100	4.45	.000
MAS	–.131	.064	–2.03	.042	–.189	.067	–2.82	.005	–.144	.061	–2.35	.019	–.061	.082	-0.75	.453
UA	.002	.058	0.03	.972	.013	.061	0.23	.820	–.045	.055	–0.81	.420	.036	.074	0.49	.626
LTO	.238	.064	3.72	.000	.117	.066	1.76	.078	.288	.061	4.71	.000	.311	.081	3.81	.000
IVR	.222	.065	3.41	.000	.259	.067	3.83	.000	.261	.062	4.22	.000	.142	.082	1.73	.084
Model Fit	R_b^2 = .668, R_o^2 = .642; χ^2 = 149.07, p = .000				R_b^2 = .609, R_o^2 = .567; χ^2 = 115.69, p =.000				R_b^2 = .730, R_0^2 = .685, χ^2 = 200.30, p = .000				R_b^2 = .571, R_0^2 = .550, χ^2 = 98.78, p = .000			

b: Unstandard regression coefficient, SE: Standard Error, z; obtained z value, significance level: $p < 0.05$

List of the countries

Australia	Croatia	Hungary	Lebanon	Romania	Thailand
Albania	Czech Rep	Iceland	Lithuania	Russian Fed.	Trinidad & Tobago
Angola	Denmark	India	Luxembourg	Saudi Arabia	Turkey
Argentina	Dominician Rep.	Indonesia	Malaysia	Senegal	Ukraine
Austria	Egypt	Iran	Mexico	Serbia	United Arab Emirates
Bangladesh	El Salvador	Ireland	Morocco	Singapore	United Kingdom
Belgium	Estonia	Israel	Netherlands	Slovak Rep	United States
Brazil	Etihophia	Italy	Nigeria	Slovenia	Uruguay
Bulgaria	Finland	Jamaica	Norway	South Africa	Venezuela
Burkina Faso	France	Japan	Pakistan	South Korea	Zambia
Canada	Germany	Jordan	Peru	Spain	
Chile	Greece	Kenya	Philippines	Sweden	
China	Guatemala	Kuwait	Poland	Switzerland	
Colombia	Hong Kong	Latvia	Portugal	Tanzania	

APPENDIX 2. Cultural and Economic Level Groupings*

ID	Country	WB4	PD	IND	MAS	LTO	IVR
1	Australia	4	1	3	3	1	3
2	Austria	4	1	2	3	3	3
3	Belgium	4	3	3	2	3	2
4	Canada	4	1	3	2	1	3
5	Chile	4	3	1	1	1	3
6	Czech Rep	4	2	2	2	3	1
7	Denmark	4	1	3	1	1	3
8	Estonia	4	2	2	1	3	1
9	Finland	4	1	3	1	1	2
10	France	4	3	3	2	3	2
11	Germany	4	1	3	3	3	2
12	Greece	4	2	1	2	2	2
13	Hungary	4	2	3	3	2	1
14	Iceland	4	1	2	1	1	3
15	Ireland	4	1	3	3	1	3
16	Israel	4	1	2	2	1	2
17	Italy	4	2	3	3	3	1
18	Japan	4	2	2	3	3	2
19	South Korea	4	2	1	1	3	1
20	Latvia	4	2	3	1	3	1
21	Luxembourg	4	2	2	2	3	2
22	Mexico	3	3	1	3	1	3
23	Netherlands	4	1	3	1	3	3
24	Norway	4	1	3	1	1	2
25	Poland	4	3	2	3	1	1
26	Portugal	4	3	1	1	1	1
27	Slovak Rep	4	3	2	3	3	1
28	Slovenia	4	3	1	1	2	2
29	Spain	4	2	2	2	2	2
30	Sweden	4	1	3	1	2	3
31	Switzerland	4	1	3	3	3	3
32	Turkey	3	3	1	2	2	2
33	United Kingdom	4	1	3	3	2	3
34	United States	4	2	3	3	1	3
35	Iran	3	2	2	2	1	2
36	Brazil	3	3	1	2	2	2
37	Peru	3	3	1	2	1	2
38	Venezuela	3	3	1	3	1	3