

Individualism, Inequalities and Entrepreneurial Aspirations: Revisiting Results with GEM Data.

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Abstract In order to foster entrepreneurship, which is the main factor for economic development, entrepreneurial aspirations on individuals need to be understood. These aspirations depend on both shared beliefs (national culture) and barriers at the country level. Existing results on the literature date back from a decade ago, and support that individualism affects entrepreneurial aspirations, moderated by the economic development and inequalities of the region. The present study updates the data set and uses a different approach to provide new results, which show that in underdeveloped countries entrepreneurial aspirations are negatively linked to individualism. In developed countries, however, entrepreneurship is not linked to individualism, but to inequalities. The implications of these results are discussed in the paper.

Keywords: Company founder, Total Early-Stage Entrepreneurial Activity (TEA), Hofstede, Global Entrepreneurship Monitor (GEM), Multilayer Perceptron (MLP)

1 Introduction

Entrepreneurs are the cornerstone of economic development. In a capitalist society, the existence of individuals that risk their savings for creating value and employment through a new venture is the detonator for economic growth.

For this reason, understanding entrepreneurial aspirations of the society is crucial. The act of founding a company is dependent on two sets of factors, namely (i) psychological traits of the individual and (ii) existence of barriers for

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entrepreneurship in the country or region (Pablo-Lerchundi et al. 2015; Morales-Alonso, et al. 2016; Morales-Alonso, et al. 2016; Hayton et al. 2002).

Among the former, the national culture as defined by Prof. Geert Hofstede (Hofstede, 1991) is of capital importance (Pinillos and Reyes, 2011). Regarding the latter, national and supra-national institutions play a fundamental role in the development of entrepreneurial activities.

When it comes to evaluating how entrepreneurial a society is, the data provided by the Global Entrepreneurship Monitor (GEM) is an inevitable reference. GEM is an international observatory that analyses, on a yearly basis, the entrepreneurial character of a society at a national level.

In the seminal contribution of Wennekers et al. (2005), a U-shape relationship between new ventures rate and purchasing power at parity (PPP, i.e. the per capita GDP) is presented. That is to say, in those countries where PPP is low, entrepreneurial rates tend to be high, which speaks of the difficulties in finding jobs in underdeveloped economies, resulting in self-employment as a good option. As PPP increases, the rates of new business creation decrease, causing the lower part of the U-shape plot. Last, there is a set of countries where innovation and risk assumption are well valued. This, when combined with the existence of a market capital prone to entrepreneurship, produces a high rate of new companies being created in countries with high PPP.

However, within this U-shape relationship, there is also some dispersion at PPP constant level. That is, some countries with similar PPP present very different rates of new business being created, being this fact attributed to differences in national culture (Pinillos and Reyes, 2011). This effect of national culture, however, is moderated by the level of development of a society. The correlation between entrepreneurial aspiration and individualism is positive for developed economies and negative for medium and low developed economies. This result from Pinillos and Reyes (2011) is far-reaching, as it calls for difficulties of economic development due to economic inequalities, which is the thesis defended as well by Acemoglu and Robinson (2012). Nevertheless, the study of Pinillos and Reyes (2011) relies on data from years 1999-2007, that is, just before the financial crisis from 2008. The last decade has been particularly intense from an economic perspective for countries like Spain, Italy, Greece or Ireland, especially when compared with Germany, England or the USA. Rates of unemployment have increased dramatically in the former countries, which may have affected their rate of business creation, as well as their type.

It is therefore of interest to re-visit the results obtained by these researchers and compare them with the actual data gathered from GEM in the year 2016. This study intends to shed light on the influence of individualism and collectivism over entrepreneurial orientations, moderated by economic development and inequalities of each society. Artificial Neural Networks, and in particular the Multilayer Perceptron (MLP) technique, has been used for this end.

2 State of the art

The GEM is an international organization devoted to the gathering of high-quality worldwide information about entrepreneurship. Being originally an initiative of Babson College together with London Business School, it has grown to become the principal think tank for entrepreneurship. Today is funded by more than 200 institutions, analyses more than 100 economies and reports results from over 200,000 interviews yearly.

As already mentioned in the introduction, one of the most important parameters measured by GEM is the Total Early-Stage Entrepreneurial Activity (TEA), which is calculated by surveying a sample between 18 and 64 years old. The TEA is the ratio of individuals in the mentioned age range who are actively involved in business start-ups (companies spanning 0-42 months of age).

That is, the TEA can be taken as a measure of entrepreneurial aspiration of a society. This is a value that can be measured and is an input for this study. However, the underlying factors that lead TEA to be different from one country to other are uncertain. Existing literature supports the TEA being moderated by two factors: the shared beliefs of a given society, and the support provided by formal institutions.

We deal with these two factors in the following way. First, the shared beliefs of a given society, which at an individual level can be identified as psychological traits (Hayton, George, and Zahra, 2002). These traits allow or prevent from risk assumption, and they are related to the existence of social norms, that is, to the extent in which society values positively or negatively the professional option of being self-employed. The existing norms and beliefs at a society level can be analysed under the lens of the national culture of the society, being the 6-D Model from Hofstede (Hofstede, 2018) the most common framework reference (Wennekers *et al.*, 2007; Wennberg, Pathak and Autio, 2013).

Among the six factors that Hofstede uses to define culture, individualism-collectivism has been thoroughly cited as the prevalent one when it comes to entrepreneurship (Thomas and Mueller, 2000; Bosma and Harding, 2006; Pinillos and Reyes, 2011). In particular, following Pinillos and Reyes (2011), a country's orientation towards individualism define the value of TEA but moderated by its economic development.

Individualism-collectivism refers to the degree to which the society of a country prefers to act as individuals in front of as members of a group, that is, it measures the degree to which a community values personal goals, autonomy, and privacy versus loyalty to the group, commitment to decisions made by consensus and collective activities. In particular, those countries with collectivist cultures show greater cooperation between workers and greater connection with the company.

The second influencing factor on entrepreneurial aspirations is the level of economic development of a society, as proposed also by Pinillos and Reyes

(2011). The economic development is a complex construct, which is built from a number of different measures, such as per capita income, access to education and health systems, life expectancy, economic inequality and other factors. For the purpose of the present research, the purchase power parity (PPP) and Gini's inequality coefficient are used. Independently of how the concept is defined, countries are classified under their development level by various institutions such as OECD, the World Bank or the GEM.

When the correlation between TEA and individualism is sought after under the moderating effect of the economic development, an important difference was found by Pinillos and Reyes (2011): individualism appears to correlate with TEA in different manners for countries with different developing levels.

In accordance with the mentioned references, authors believe there is a research gap regarding how entrepreneurial activity in present times is moderated with economic development, social inequality, and cultural orientation. Therefore, the research question of this paper is:

“How is entrepreneurial activity affected in presence of different national cultures, economic development and inequality?”

To answer this question, the following hypotheses will be tested:

H1. TEA is positively influenced by individualism for the whole sample.

H2. TEA is positively influenced by individualism for the developed countries sample.

H3. TEA is positively influenced by individualism for the developing countries sample.

3 Methodology

In this study, the data on entrepreneurial aspirations collected by the Global Entrepreneurship Monitor are used. Specifically, the 2016 Global Report served to extract economic data from the 50 countries under study, including PPP and TEA. In addition, as previously mentioned, the data referring to the cultural dimensions of Hofstede have been obtained from the official page of this researcher. This data is analysed using statistical techniques and data extraction with SPSS 21 software.

On the other hand, per capita GDP or power purchase at parity (PPP), which is a macroeconomic indicator of productivity and economic development, is used to capture the performance of the economic and social conditions of a certain country. It is calculated as the ratio between GDP and the number of inhabitants of a country, measured in US Dollars.

However, the PPP does not take into account situations of inequality, so a distinction is made when introducing the Gini index, a coefficient that measures the concentration of income between individuals in a region, in a given period,

that is, measures the degree of inequality in the distribution of income or the unequal quality of a region's wealth.

The predictive model used is the Extreme Learning Machine (ELM) algorithm within the Multilayer Perceptron (MLP) of Artificial Neural Networks (ANN). They are a mathematical model to approximate and interpolate nonlinear relationships between input and output data (Rosenblatt, 1961). In addition, they present advantages referred to that less statistical formalism is needed for their development, detect non-linear relationships, detect interactions between predictor variables and have multiple training algorithms (Monje, 2015).

The procedure starts up with the creation of the database, for which the data is pre-processed in order to transform and smooth them to be used. The variables in use in this study are described in the following. The TEA that corresponds to the entrepreneurship rate of the different countries has been used as a dependent variable of scale. The predictive variables used are of the covariable scale type corresponding to the cultural factor of individuality, developed by Geert Hofstede, in addition to the Gini index and the PPP normalized with respect to Luxembourg which scores highest in this rank.

Hereafter, a predictive model is proposed, through the use of Multilayer Perceptron Neural Networks, in which the variables chosen for the study are included. The analysis was made by first making a random partition of the training, test and reserve samples. The architecture of the network is programmed automatically, being the optimal architecture achieved through an iterative process, which validates the predictive capacity of the different architectures considered. The results are based on the comparison of the values obtained from the quadratic error in the different samples (training, test, and reservation). This value must be minimized to be considered optimal. A sensitivity analysis to determine the relative importance of the independent variables in the values of the TEA is also conducted.

4 Results and Discussion

The following are results obtained from the construction and analysis of the different neural networks that were modelled to contrast the hypotheses proposed in this research.

The descriptive statistical analysis of the variables that make up the models show that it is possible to apply the technique of Artificial Neural Networks. In spite of the sample size, there are previous investigations that confirm the minimum sensitivity of the technique to small samples (Pen, Lin and Wang 2013, Sánchez-Monedero et al, 2010).

As mentioned, the training algorithm used is the Backpropagation Multilayer Perceptron. The Artificial Neural Networks were evaluated under the following

criteria: first the degree of error, second the parsimony of the hidden layers, and last the simplicity of the transfer function.

In Table 1 it can be observed that in all the model's partitions of the sample were chosen to have training samples validation and testing. In addition, the models present a non-complex structure that is denoted because the number of input layers is greater than the number of hidden layers, which indicates the parsimony in the hidden layers, therefore the parsimony of the network architecture.

Table 1 Network Architecture

Model	Variables	Network configuration	Partition	Activation function hidden layer	Activation function output layer
Model 1	TEA, IND, GINI, PPP	3-1(2)-1	Training: 64% Testing: 14% Holdout: 22%	Hyperbolic tangent	Identity
Model 2	TEA, IND, GINI, PPP	3-1(3)-1	Training: 85% Testing: 10% Holdout: 5%	Hyperbolic tangent	Identity
Model 3	TEA, IND, GINI, PPP	3-1(1)-1	Training: 77% Testing: 6% Holdout: 17%	Hyperbolic tangent	Identity

Also, the activation functions present in the models show that the relationships between the input and output variables are not linear, because the vector spaces of the variables are more complex in their mathematical form, but more precise in their classification.

Table 2 Network Error Evaluation

Model	Training Sum of squares error	Test Sum of squares error	Holdout Relative error
Model 1	10.58	4.46	0.86
Model 2	7.13	0.38	1.42
Model 3	9.70	1.86	1.31

Regarding the evaluation of the networks, the results shown in Table 2 indicate that the constructed neural networks are suitable for the prediction of each model due to the low percentage of error obtained in the validation and test sets. Therefore, the results obtained show the influence that each of the independent variables contributes to the values that the TEA can adopt.

Table 3 summarizes the results obtained in this study, in which the importance of each dependent variable (Individualism, Gini coefficient, and PPP) on the independent variable (TEA) is presented. In Model 1 (whole sample), individualism is not the most important factor in determining TEA, but Gini coefficient. For this reason, H1 is not supported. Likewise, in Model 2 (developed countries) the Gini coefficient is again the predominant factor, being H2 also not supported. Contrarily, individualism is a key factor for TEA for developing economies (Model 3), which calls for H3 being supported.

Table 3 Importance of the independent variables over TEA

Model	Importance			Relative Importance		
	IND	GINI	PPP	IND	GINI	PPP
Model 1	0.21	0.61	0.18	34.5%	100%	28.9%
Model 2	0.11	0.76	0.13	14.7%	100%	17.3%
Model 3	0.50	0.11	0.30	100%	21.5%	76.6%

These results reflect that the entrepreneurial activity of the total sample under study (Model 1) is influenced in a very significant way by inequality (GINI = 0.61) and the presence of different levels of individualism (IND = 0.28). With regard to those countries with higher development level (Model 2), economic development (PPP = 0.13) and inequality (GINI = 0.76) are the factors that most affect entrepreneurship. Last, in the less developed countries (Model 3), entrepreneurial activity is influenced to a greater extent by individualism (IND = 0.50) and economic development (PPP = 0.30). These results give us an answer to the research question posed.

When compared to the results presented by Pinillos and Reyes (2011), it can be seen that results have changed in the last decade, in particular for developed countries. That is, differences in national culture appear to be moderated, while the lack of inequalities seems to foster entrepreneurship, as in the past.

Contrarily, for underdeveloped countries, national culture, and in particular, individualism remains the prevalent factor. The highest the individualism, the lesser entrepreneurial is a society in these economies, as posed by Pinillos and Reyes (2011).

5 Conclusion

Entrepreneurship is crucial for economic development. For this reason, understanding its determinants is of the greatest importance. Data from the panel of GEM has been used and compared with previous results, focusing both on national culture (individualism) measures and economic development and inequalities.

Results show that cultural differences between countries tend to moderate, especially among developed ones. Therefore, in developed countries, although nominally they have different cultures, in practice people are mainly exposed to a homogeneous culture due to globalization. In other words, cultural differences do not predominate, but the conditions of the environment, and in particular, inequality.

On the contrary, the less developed countries are more attached to their culture, and there the differences in individualism are noticeable when it comes to seeing entrepreneurial aspirations.

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