# The effect of cultural environment on entrepreneurial decisions

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## Abstract

**Purpose:** This paper empirically examines whether the cultural environment plays a role in entrepreneurial decisions in Europe, the United States, Canada, and Australia.

**Methodology:** To explore this issue, we use data from the Adult Population Survey of 2010 to 2015 provided by the Global Entrepreneurship Monitor (GEM). To calculate the cultural factor, we utilize additional information from the GEM National Expert Survey data, and estimate a probit model to measure the effect of culture based on an unobserved latent variable of satisfaction, measured through a dichotomous variable identifying entrepreneurs.

**Findings:** Results show a positive and statistically significant relationship between the cultural factor and the individual choice of entrepreneurial activity. Our findings are subjected to a range of robustness checks. We extend this analysis to an examination of cultural values as predictors of entrepreneurship status in collectivist and individualist countries. Our results point to collectivist and individualist roles as being among the mechanisms through which the cultural environment may operate.

**Originality:** This is the first empirical work that clusters a wide range of variables provided by the GEM NES data to obtain a cultural indicator, and then applies this indicator to the GEM APS micro data. Policy-makers should consider these results in order to promote entrepreneurship through culture in collectivist and Mediterranean countries, but use other channels in individualist and Anglo-Saxon countries.

## 1. INTRODUCTION

In developed economies, there has been an increasing interest in the promotion of entrepreneurship in recent years, in order to achieve economic growth, innovation, household welfare, and fight unemployment and poverty (Acs, 1992; Audretsch, 2007; Naudé *et al*., 2008; Minniti and Naudé, 2010; Naudé, 2010; Allen and Langowitz, 2011; Fuentelsaz *et al*., 2015). However, as shown in Figure 1, the percentage of entrepreneurs across developed countries seems to be heterogeneous. There are considerable dissimilarities among countries, ranging from a minimum proportion of 4.6% of the working-age population being entrepreneurs in Germany, to a maximum of 14.7% in Canada in the year 2015. In this context, researchers have focused on studying the determinants of entrepreneurial activity in recent years, including institutional factors (North, 1986; Torrini, 2005), the financial environment (Yu, 1998; Bjornskov and Foss, 2006), economic conditions (Storey and Johnson, 1987; Wennekers and Thurik, 1999; Evans and Jovanovic, 2002; Bogan and Darity, 2008; Thurik *et al*., 2008; Gohmann, 2012), and socio-economic characteristics of entrepreneurs (Evans and Leighton, 1989; Keeble *et al*., 1993; Blanchflower, 2004; Parker and Robson, 2004; Koellinger and Minniti, 2006; Velilla and Ortega, 2017). Although all these factors may affect the individual decision about becoming an entrepreneur or not, the cultural environment towards entrepreneurship established in each country has contributed to increase the differences observed in entrepreneurship rates across countries (e.g., Acs, 1992; Cooper and Yin, 2005; Minniti, 2005). In this paper, we focus on studying the impact of the cultural environment on individual entrepreneurial decisions.

Classical theorists like Adam Smith, Karl Marx, and Max Weber have discussed the role played by cultural values in encouraging economic activity. Since entrepreneurship is widely regarded as an important determinant of innovation and economic growth, our study is considered a reasonable approach. Other authors have examined the effect of culture on a range of socioeconomic and demographic variables in recent years, including unemployment (Brügger *et al*., 2009), job search (Eugster *et al*., 2016), marriage and cohabitation (Marcén and Morales, 2019), homeownership (Marcén and Morales, 2020) and fertility decisions (Marcén *et al*., 2018), among others. These studies have concluded that individuals follow social norms in order to avoid being ostracized. Thus, it may also be possible that decisions regarding whether or not to become an entrepreneur depend on social norms and cultural values, since some countries have more acceptable attitudes towards entrepreneurship than others.

Against this background, this paper addresses the effect of the cultural environment on entrepreneurial decisions, using both macro- and micro-data from the Global Entrepreneurship Monitor (GEM), for years 2010 to 2015, for developed economies. GEM is the most important study of entrepreneurship in the world, and a recent review of GEM can be read in Bosma *et al.* (2020). The GEM methodology identifies entrepreneurs as those individuals who contribute to

the "Total (early-stage) Entrepreneurial Activity" (TEA) index, i.e., individuals "who are about to begin, or have started an entrepreneurial activity in the last 42 months". This definition is standard in the literature of entrepreneurship using GEM data, rather than other characterizations, such as self-employed workers, business owners, businessmen without employees, or all these together (Artz, 2016). We use micro-data from the GEM Adult Population Survey (APS) for years 2010 to 2015, focusing on developed economies (i.e., European countries, the United States, Canada, and Australia). To calculate the cultural factors that may affect individuals' entrepreneurial decisions, we use additional data from the GEM National Expert Survey (NES), for years 2010 to 2015. We first carry out a factorial analysis that allows us to cluster the wide range of national variables provided by the NES in different categories, including a factor that captures the cultural dimension of entrepreneurship. Then, we analyze the effect of these factors on entrepreneurial decisions of individuals, with a focus on cultural characteristics. Our results show that a country's culture towards entrepreneurship has a significant impact on entrepreneurial decisions. For instance, those individuals living in countries where cultural beliefs promote entrepreneurial activity are more likely to become entrepreneurs, than those living in countries where being an entrepreneur is not established or encouraged by the prevailing social norms.

Second, we study whether the effect of the cultural environment on entrepreneurial decisions differs among groups of countries, as different attitudes toward entrepreneurship may lead to different levels of exclusion among entrepreneurs. That is, a strong social stigma attached to entrepreneurship, emphasizing (or not) self-sufficiency or innovation, for example, may reduce the level of satisfaction among entrepreneurs in some cultures more than in others. To tackle this issue, we analyze collectivist and individualist countries separately. While collectivism stresses the importance of the community, individualism is focused on the rights and concerns of each person. The results point to the cultural environment being especially important in collectivist countries, which gives an important weight to social norms, whereas its role in individualist countries is not statistically significant, given that these countries are characterized by safeguarding personal attitudes.

This paper is not the first empirical study of the cultural factors related to entrepreneurship, but it is the first empirical analysis that clusters the macroeconomic factors of entrepreneurship from the GEM NES data to obtain a cultural indicator, and then merge the information with the GEM APS micro-data, to study its impact on individual entrepreneurial decisions. Our work contributes to the literature that has focused on studying the impact of culture on individual socioeconomic behaviors, by determining the importance of the cultural environment in entrepreneurial decisions in developed economies, and also contributes to the field of entrepreneurship and its determinants, both macro- and micro-economic.

The remainder of the paper is organized as follows. Section 2 presents a conceptual framework to characterize the potential impact of culture and social norms on entrepreneurial decisions. Sections 3 and 4 describe the data and the empirical strategy, respectively, while the main results are discussed in Section 5. Finally, Section 6 concludes.

## 2. CONCEPTUAL FRAMEWORK

This analysis is not the first to analyze the role of culture in determining entrepreneurial activity. Prior research has analyzed the correlation between culture and entrepreneurship in a range of countries, focusing on the interrelationships among religion, education, risk-taking behavior, institutional, geographic and macroeconomic factors, innovation and creativity, openness to change and self-efficacy, the stigma of business failure, and individualism values (Ajide and Osinubi, 2020; Altinay, 2008; Barbosa *et al*., 2019; Bayraktar, 2016; Calza *et al*., 2020; Çelikkol *et al*., 2019; Chukwuma-Nwuba, 2018; Danish *et al*., 2019; Estrada-Cruz *et al*., 2019; Idjaz *et al*., 2012; Lee *et al*., 2020; Ostapenko, 2017; Thurik and Dejardin, 2011; Williams and Vorley, 2015). Using a similar approach, Marcen (2014) finds that the entrepreneurial decisions of second-generation immigrants in the US depend on the entrepreneurial rates in their countries of origin; Butler and Herring (1991) show evidence of the intergenerational transmission of entrepreneurship; and Stevenson (2000) suggests that individuals living in societies that favor entrepreneurship are more likely to become entrepreneurs in the future.

Additionally, Ao and Liu (2014) report that the perception of culture by individuals determines entrepreneurial behavior among American-born Chinese individuals, and Gimenez-Jimenez *et al*. (2020) find that culture affects informal institutions, and such institutions have an impact on the probability of individuals becoming entrepreneurs. These studies all suggest that it is the perception of culture by individuals, and how culture determines other macroeconomic dimensions, that determines entrepreneurial intentions.

On the other hand, GEM has analyzed the impact of culture on entrepreneurial decisions in both theoretical and empirical settings (see Bosma *et al*., 2020). Here, we take GEM's methodology and theoretical setting as a framework, to develop a conceptual approach to analyze the impact of cultural values and social norms towards entrepreneurship on individual entrepreneurial decisions. According to this approach, summarized in Figure 2, we consider the decisions that must be taken by individuals: to become an entrepreneur, or not, which are considered the output of a process that depends on several aspects, or dimensions, both at the macroeconomic and the microeconomic level.

First, from a macroeconomic perspective, we consider several dimensions at country level that are considered to enhance entrepreneurial activity: the availability of financial resources for

entrepreneurs, Governmental policies aiming to support entrepreneurial activity (including taxes, bureaucracy, transfers…), specific programs for entrepreneurs, R&D transfers, the particular dynamics of the market, and available infrastructure to start a business. All these conditions are linked to an additional macroeconomic aspect: the culture and social norms towards entrepreneurship, with such a link being established by a number of prior studies. Specifically, we consider that in a given economy, where the social norms consider entrepreneurship a desirable career, the macroeconomic conditions will favor entrepreneurial activity, and thus the individual may be influenced by culture both directly, through the role of the remaining set of macroeconomic conditions, and indirectly through the influence of culture and macroeconomic conditions of individuals' microeconomic attributes.

For example, if the culture of a given country supports entrepreneurship, the Government will create specific programs to enhance entrepreneurship; R&D transfers, taxes, infrastructure and bureaucracy will also be such that the entrepreneurial activity is supported, and there will be specific education programs aiming at introducing entrepreneurial culture to students. These conditions will affect individual perceptions of entrepreneurship, in terms of entrepreneurial opportunities, increasing the probability of unemployed individuals becoming entrepreneurs (that is, increasing the proportion of necessity-driven entrepreneurs), improving managerial skills, nurturing a so-called "entrepreneurial spirit", and moderating the relationship between household composition and entrepreneurship.[1] All these microeconomic conditions will determine the output decision, i.e., whether individuals decide, or not, to become entrepreneurs. Social norms encouraging entrepreneurship may also affect this final output decision *directly*, creating an increased probability of becoming an entrepreneur. This is precisely the channel we are exploring.

*Hypothesis: Even after controlling for a set of macroeconomic and microeconomic variables related to enhancing entrepreneurial activity, which are correlated with entrepreneurial culture and social norms, the individual decision to become an entrepreneur, or not, is directly determined by the country's social norms and culture towards entrepreneurship*.

## 3. DATA

To test for the hypothesis proposed in Section 2, we use data from the GEM, the world's foremost study of entrepreneurship, which provides high-quality information to study different dimensions of entrepreneurship (Bosma *et al*., 2020). For instance, GEM looks at two differentiated elements related to entrepreneurship. First, GEM studies the entrepreneurial behavior and attitudes of

[1] Several authors have found that entrepreneurship is a natural solution for both fathers and mothers to deal with work-family conflicts (e.g., Gimenez-Nadal *et al*., 2012).

individuals (social characteristics, motivations, ambitions, etc.), ollected in the Adult Population Surveys (APS) data. Second, GEM analyzes the national context that may determine the entrepreneurial activity in a given region, and this information is collected in the National Expert Surveys (NES).[2] The APS is conducted and elaborated every year, and consists of a representative national sample of at least 2,000 individuals per country, with a focus on the role of individuals in the entrepreneurial process. These samples constitute a cross-sectional database, as different individuals are interviewed every year. The NES (which is also elaborated yearly as part of the standard GEM methodology) includes information on nine dimensions of entrepreneurial framework conditions, each containing several items related to the national context, that take values from 1 ("total disagreement") to 9 ("total agreement"). For the NES data, we omit the 9 pre-defined dimensions, and focus on the full set of variables, which we will cluster based on inter-variable correlations.[3] We use data, from both surveys, for the period 2010-2015.

We first restrict the APS sample to individuals between 25 and 65 years old, to minimize the role of worker decisions over the life cycle (Aguiar and Hurst, 2007). We also retain individuals who live in Australia, Canada, the United States (US), and European economies (Austria, Belgium, Bosnia and Herzegovina, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom (UK)).[4] These restrictions leave 391,904 observations of individuals from the APS, residing in the analyzed countries. The APS data includes the following information for the interviewees: age, measured in years; gender, which is defined as a dummy variable taking value 1 for males, 0 for females; education, which we recode in a dummy that takes value 1 for individuals whose maximum level of education is secondary education or less, 0 if the respondent has attended University; family size, income levels, including three standardized categories; and activity status, differentiating among employed workers, unemployed workers, entrepreneurs, homemakers, and retired individuals (the latter being removed from the sample).

Second, we keep in the NES sample the same countries as in the APS sample, and we use the whole range of national variables provided by the NES (see Appendix A) to build our

[2] See more information at https://www.gemconsortium.org.
[3] The nine dimensions defined by GEM are: entrepreneurial finance, government policies, entrepreneurial education, government programs, R&D transfer, commercial and legal infrastructure, internal markets, physical infrastructure, and cultural and social norms. See https://www.gemconsortium.org/wiki/1154 for more information.
[4] Thus, we aim to focus only on developed economies, as entrepreneurial activity has been found to be correlated to development in complex ways. The potential moderating impact of culture on this complex relationship is beyond the scope of this analysis, and is left for future research.

principal elements for our factorial analysis. The main explanatory variable resulting from this factorial analysis, representing the cultural environment in a given country for a given year, is defined as the matching-up of national variables providing information about whether the national culture: 1) encourages entrepreneurial risk-taking; 2) is highly supportive of individual success achieved through own personal efforts; 3) emphasizes self-sufficiency, autonomy, and personal initiative; 4) encourages creativity and innovation; and 5) emphasizes the responsibility of the individual (rather than the collective) in managing their own life.

Table 1 shows the summary statistics for the relevant variables by country, ordered from the lowest to the highest proportion of entrepreneurs. Column (1) suggests the existence of considerable differences in entrepreneurial levels among countries, which are consistent with the rates shown in Figure 1 for the year 2015. For instance, the lowest rate of entrepreneurs according to the sample is found in Italy, where only 4% of the sample are entrepreneurs, while Montenegro reports the largest rate of entrepreneurs, as 15% of the individuals in the sample reported being entrepreneurs in this country. The remaining Columns in Table 1 describe other important variables of the sample.[5] Table 2, on the other hand, shows information about the cultural variables, by country. (Table B1 in Appendix B shows descriptive statistics for the whole set of NES items.) There are large differences in the social environment towards entrepreneurship in the analyzed economies, and countries with low rates of entrepreneurs seem to show the lowest levels of cultural variables (e.g., the Czech Republic and Hungary), while countries that favor entrepreneurial activity through culture show the highest rates of entrepreneurs (e.g., Estonia and Slovakia). This figure suggests that cultural environment may be correlated with the entrepreneurial decision. Nevertheless, this correlation may be affected by both individuals' characteristics, and other macroeconomic conditions. Thus, we aim to explore whether the culture towards entrepreneurship is indeed correlated with individual entrepreneurial decisions, net of both individual and country observed factors.

## 4. EMPIRICAL STRATEGY

To identify the effect of the cultural environment on entrepreneurial decisions, we first carry out an explanatory factorial analysis, given that we do not know the final number of factors, which will be determined through the empirical application. This allows us to cluster the large range of national variables provided by the NES data into a small set of (uncorrelated and standardized) factors, so that the factor-clustered cultural variable(s) will constitute our explanatory variable(s) of interest, and will capture the cultural environment in each country and year.

[5] Detailed summary statistics of other items in the APS and NES data are available upon request.

Once the cultural factor is defined, our main goal is to study its effect on the entrepreneurial decisions of individuals, using data from the GEM APS. To that end, we first merge the resulted factors from the factorial analysis and the APS micro-data, by country and year. Then, and given that the dependent variable is a dichotomous variable that takes the value 1 for those individuals who are entrepreneurs, 0 otherwise, we propose a Probit model. This model also emerges from an underlying model of latent variables, which can be described as follows. When an individual decides to become an entrepreneur, we assume that he/she is acting on the basis of a subjective index of satisfaction that depends on a certain set of features. If the cultural environment has any role in this subjective index, then we would expect that the cultural factor has a significant impact on the probability of becoming an entrepreneur. Formally, we analyze this issue using the following equation:

$$Y_{ij}^{*} = \beta_0 + \beta_1 C_j + \boldsymbol{\beta}_2 \mathbf{X}_{ij} + \delta_k + \gamma + u_{ij}, \quad (1)$$

where $Y_{ij}^{*}$ is the unobservable latent variable, defined as:

$Y_{ij}^{*} > 0 \;\; \Leftrightarrow Y_{ij} = 1$, and individual "*i*" is an entrepreneur,

$Y_{ij}^{*} \leq 0 \Leftrightarrow Y_{ij} = 0$, and individual "*i*" is not an entrepreneur.

with $Y_{ijk}$ being a dichotomous variable, $Y_{ij}$, that takes value 1 when individual "*i*", residing in country "*j*", is an entrepreneur, and 0 otherwise. $C_j$ represents the cultural environment of country "*j*", and $\mathbf{X}_{ij}$ is a vector of socio-demographic controls, namely gender, age, and education.[6] The parameters $\delta_k$ and $\gamma$ represent country fixed effects and year fixed effects, respectively. If culture plays a significant role in entrepreneurial decisions, once we control for individual sociodemographics and country fixed effects, we could conclude that individuals from countries where society favors entrepreneurial activity should be more likely to be or become entrepreneurs, and we would expect $\beta_1 > 0$, and statistically different from zero at standard levels.

## 5. RESULTS

### 5.1 Factorial Analysis

We cluster the wide range of available variables of the NES into a small group of factors, using factorial analysis, and we determine the appropriateness of this by examining the correlations among the NES variables, using the Kaiser-Meyer-Olkin (KMO) measure for sampling adequacy, and the Bartlett's test of sphericity. The value of the KMO is estimated to be 0.972,

[6] These variables have been found to determine individuals' entrepreneurial decisions. See Coduras *et al*., (2018).

and Bartlett's Test of Sphericity rejects that the correlation matrix is the identity matrix (with an associated p-value < 0.01). These statistics suggest that there are significant relationships among the variables of the NES data and, therefore, it is appropriate to perform a factorial analysis. (A more detailed examination of the correlation matrix, communalities of variables, and reproduced correlation matrix is available on request).

We then extract components using a principal component analysis (PCA). The number of factors to extract is not fixed *a priori*, but is calculated according to the data. Eigenvalues and a visual examination point to six components, or dimensions, of the NES data, which can be defined as follows: 1) Laws and institutions factor, related to the involvement of governments, both in making programs aimed at helping new entrepreneurs and in regulating the required permits and licenses for new and growing firms. 2) Business culture, related to the social norm followed in different aspects of entrepreneurship. For example, whether the national culture defends autonomy and personal initiative. This factor is our primary explanatory variable, representing a country's culture and social norms towards entrepreneurship. 3) Commercial access, composed of the variables that take into account the degree of access to communications (telephony or internet), suppliers, and basic services (gas, water, and electricity). 4) Financial environment, related to variables that measure whether new companies can afford the costs of market entry, or the cost of using subcontractors, suppliers, and consultants. 5) Level of business teaching in primary and secondary education, representing the role of education in entrepreneurial activity. 6) Dynamics of the internal market.[7]

It is important to acknowledge that an alternative approach could be based on taking the pre-defined GEM categories from the original items, which define "cultural and social norms" towards entrepreneurship, exclusively from the original items shown in Table 2. However, the factorial analysis reveals that we should include other items that capture social and cultural values towards entrepreneurial activity, namely public funding for new firms, new business taxes and regulation, the promotion of creativity and initiative, and technical support for new firms. This reveals inter-connections between the different conditions that enhance entrepreneurship, which do not reject GEM methodological models. However, the factors we propose to identify the cultural values towards entrepreneurship at the country level include several dimensions that omitted in GEM's benchmark classification. The composition of these cultural variables, along with the analysis of their impact on individual entrepreneurial decisions, represents the main contribution of our analysis.

[7] The eigenvalues of the correlation matrix of components and the percentages of variance explained by factors are shown in Table B2 in the Appendix B. Figure B1 shows the scree graph. The six factors considered in the analysis (e.g., factors with an associated eigenvalue lower than the unity) explain the 86.07% of the total variance. Table B3 in the Appendix B shows the (rotated) component matrix, with the factor loadings associated to the initial variables, for each of the six factors.

### 5.2 Main results

Table 3 shows the main estimated coefficients of Equation (2). (Additional coefficients are available upon request.) With respect to our primary independent variable of interest, the cultural environment towards entrepreneurship, we observe that higher values associated with this factor, representing a better cultural environment towards entrepreneurship, are correlated to increases in the probability of being an entrepreneur, net of individual observed heterogeneity, even after controlling for the rest of the national factors (see Columns (1) and (2)). Furthermore, the main results do not change when we control for unobservable country characteristics by including country fixed effects and year fixed effects, as shown in Columns (3) and (4). Thus, the results support our main hypothesis, that the cultural environment towards entrepreneurship has a significant impact on individuals' entrepreneurial decisions. The main conclusion of Table 1 is that entrepreneurial culture and social norms not only affect different macro dimensions that may favor entrepreneurship and business initiatives, but also have a direct impact on the entrepreneurial decisions of workers. This supports the theoretical framework. Even when the index used in this analysis covers a broader number of items than GEM's "cultural and social norms" aggregated variable, these results do not reject GEM models and methodologies, which acknowledge inter-relations among different conditions that may enhance entrepreneurial intentions (see Bosma *et al*., 2020, for a recent report about GEM methodology and results).

Regarding the remaining explanatory variables, age appears to be related to entrepreneurship following an inverted U-shape (achieving the maximum increase in the probability of becoming an entrepreneur at age 33), as has been reported in prior research (Parker, 2004; Schott and Bagger, 2004; Kelley, 2009; Levesque and Minniti, 2009; Coduras *et al*., 2018). Since younger individuals may be more enthusiastic and more prone to risk-taking, but entrepreneurial and managerial skills improve with age, our results are not surprising. Regarding education, estimates show that individuals who have completed secondary school have a lower probability of being entrepreneurs. This result is in line with prior research in Europe showing that highly educated individuals do not tend to become entrepreneurs. Finally, our estimates show that men are more likely than women to become entrepreneurs, in line with an extensive literature (Boden and Nucci, 2000; Du Rietz and Henreckson, 2000; Langowitz and Minniti, 2006; Minniti and Nardone, 2007; Fairlie and Robb, 2009; Robinson and Stubberud, 2009; Ahl and Nelson, 2010; Marcén, 2014; Artz, 2016; Gimenez-Nadal *et al*., 2019).

### 5.3 Robustness checks

We run some robustness checks in order to reinforce our conclusions. Results are shown in Table 4. In Columns (1) to (3), we repeat the analysis without the two countries with the largest number of observations (Spain and Germany) to check whether they are driving our estimates. Estimates

do not significantly change. Additionally, we divide the sample in two groups: individuals between 25 and 46 years old (inclusive), and individuals between 47 and 65 years old (inclusive), i.e., young and senior individuals, as entrepreneurial behaviors and attitudes of the elder population may differ from those of younger workers (Kautonen, 2008; Kautonen *et al*., 2011; Schott *et al*., 2017; Velilla *et al*., 2018). The role of culture may also be more prevalent among younger or senior workers than among the middle-aged. Estimates for younger individuals are shown in Column (4), while those for senior individuals are shown in Column (5). The main coefficients quantitatively differ between seniors and the young (according to t-type tests), but in both cases the impact of culture on the probability of being an entrepreneur is positive and statistically significant at standard levels, although suggesting that the effect of culture on entrepreneurial decisions increases with age. In Column (6), we enlarge the set of explanatory variables, adding controls for whether individuals live in a household with more than five members, whether they are homemakers, and whether they are ranked in the middle of an income-scale.[8] Finally, we redefine the dependent variable as the probability of expecting to become an entrepreneur in the future, to analyze whether different definitions of entrepreneurs may drive the results in Column (7).[9] These robustness checks provide conclusions similar to the main analysis, suggesting that the results are robust to the identification of entrepreneurs, to age effects, and to sample selection issues.

### 5.4 Collectivist Countries vs Individualist Countries

The empirical analysis so far has considered the whole sample of individuals for all the countries, disregarding country values. Nevertheless, recent studies have shown that cultural factors can have a differential effect for collectivist and individualist countries (Begley and Tan, 2001). Collectivist cultures give priority to the needs and goals of the group over the needs and desires of individuals, and thus the relationships with others play a central role in each individual's life. This contrasts with individualistic countries, focused on individual rights and concerns. In this setting, those living in collectivistic countries, whose cultures place entrepreneurs high (low) in social status, may be more (less) likely to be interested in starting a business. Oppositely, those living in individualist countries, who view entrepreneurship as high in social status from an individual point of view, may be less affected by the country's entrepreneurial culture and values, and then their entrepreneurial decisions may not depend on whether this status is supported by their national culture. Thus, social values may be connected to encourage entrepreneurship more strongly in collectivist countries than in individualist countries.

[8] The GEM APS data classifies individuals in three categories, according to their income: low-income level, middle-income level, and high-income level.
[9] We restrict the sample to individuals below the age of 36 years.

To tackle this issue, we have re-run the entire analysis in Table 5, separating the sample between collectivist and individualist countries.[10] We also differentiate between Mediterranean and Anglo-Saxon countries, to determine whether this classification of countries may affect the main conclusions. The results show that. as expected, the cultural environment emphasizing entrepreneurship is correlated with an increased probability of being an entrepreneur in collectivist countries (Column (1)), not in individualist countries (Column (2)), where such a correlation is found to be not statistically significant at standard levels. These results are consistent with prior literature suggesting that cultural values are especially important in collectivist countries (Begley and Tan, 2001), and also with studies that have found the role of regional- and age-specific peer effects to operate mainly in collectivist economies (Bönte *et al*., 2009). Since, in these collectivist countries, family and community networks constitute a more important source of transmission than in non-collectivist ones, individuals residing there may be more sensitive to the national culture. As a consequence, if individuals living in collectivist economies do not want to be rejected by society, their decision to be an entrepreneur, or not, is more sensitive to the role of social norms.

Similar conclusions are found when we compare the effect of cultural environment on entrepreneurial decisions in Mediterranean and Anglo-Saxon countries in Columns (3) and (4), respectively. While Anglo-Saxon societies put more emphasis on the individual than on social norms, Mediterranean countries are more related to values of collectivism, and individuals are particularly sensitive to the judgment of the public (Hofstede, 1980). To sum up, all the results described in this section suggest that individualist and collectivist roles can constitute one of the channels through which culture may operate in entrepreneurial decisions.

## 6. CONCLUSIONS

The aim of this paper is to analyze the effect of the cultural environment on the individual choice to become an entrepreneur, or not, in developed countries. Recent research has focused on the main factors affecting entrepreneurial decisions, and we contribute to this branch of the literature by, first, constructing a measure of national culture towards entrepreneurship, and second, analyzing how it correlates with entrepreneurial choices. Using data from the GEM NES and APS databases for the period 2010-2015, we build up a new "entrepreneurial culture" factor, which captures a wider range of entrepreneurial dimensions than the GEM's predefined factors, and we show that our measure of national culture is correlated with the probability of individuals becoming entrepreneurs in that country, net of individual characteristics and other national components that may affect entrepreneurship: the greater the national culture supporting

[10]The information to elaborate the collectivist and individualist samples came from https://www.hofstede-insights.com/.

entrepreneurship, the higher the probability of becoming an entrepreneur. We further show that the effect of culture on entrepreneurship is especially important in collectivist and Mediterranean economies, but not in individualist and Anglo-Saxon countries.

The empirical analysis has certain limitations. The data is a cross-section and, despite that we use different kinds of data (e.g., macro and micro-data), we cannot talk about causal effects. Thus, results are based only on conditional correlations. Furthermore, even though we include country and year fixed effects, we must acknowledge the role of unobserved heterogeneity and potential endogeneity in our estimates. Finally, the definition of an entrepreneur is not standard in the literature but, given that we use data from GEM, we have defined entrepreneurs in terms of the TEA index (i.e., individuals who are about to start a business, or that have started one in the last 42 months), the main indicator of the GEM. Even when the results are robust to alternative definitions of entrepreneurs (e.g., individuals who aim to become entrepreneurs in the short-run), we must acknowledge that different definitions may lead to different results.

Despite these limitations, the main conclusions of the analysis should be considered by planners and policy makers, given the initiatives to encourage entrepreneurship at different institutional levels that have emerged during recent decades (e.g., the "Entrepreneurship 2020 Action Plan", the "Supporting Entrepreneurship"" of the European Commission, and the "Erasmus for Young Entrepreneurs" initiative of the European Union). Our results show that entrepreneurial decisions focus on particular societal values and, therefore, the response to these plans may differ depending on a country's entrepreneurial culture, as individuals from societies where social norms are more important (e.g., collectivistic economies) can be more affected by entrepreneurial policies aiming to change social norms and culture. Conversely, those in individualist economies may not respond to such policies, and plans that focus on individual benefits should be more appropriate. Thus, policy-makers should consider these results in order to promote entrepreneurship through culture in collectivist and Mediterranean countries, but use other channels in individualist and Anglo-Saxon countries.

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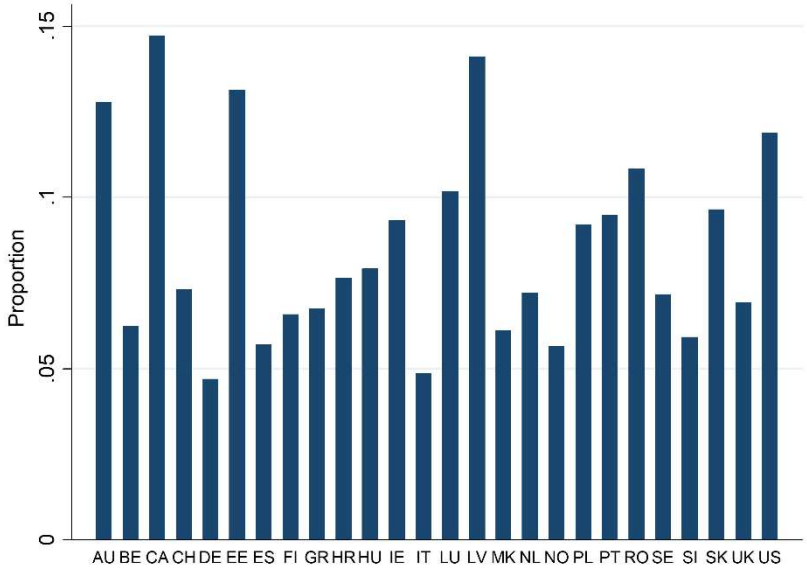
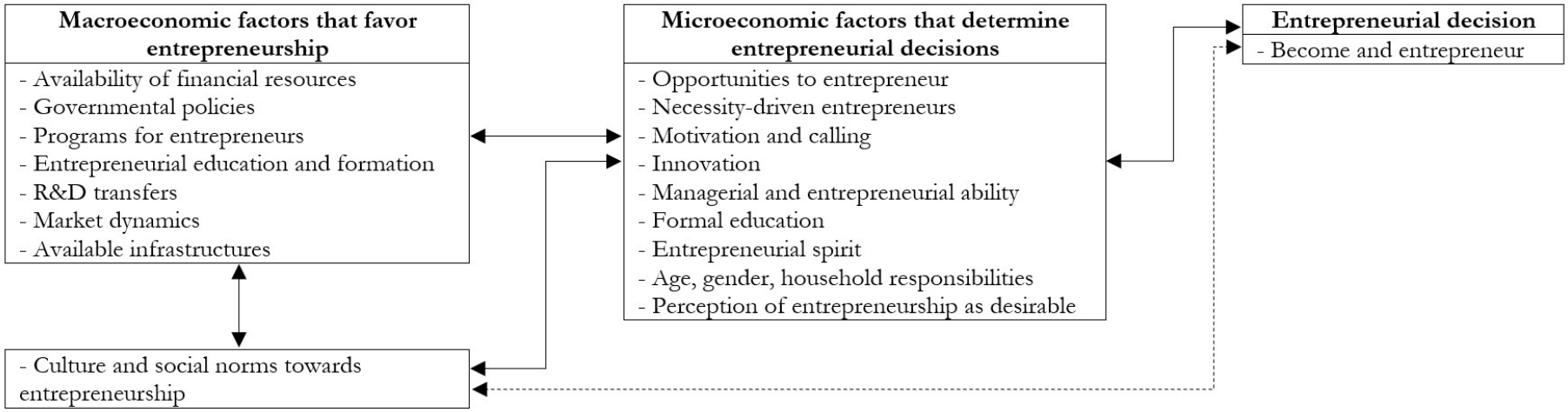
**Figure 1: Proportion of entrepreneurs in 2015, by country**




Source: GEM 2015 APS. Entrepreneurs are defined according to the TEA index.

**Figure 2: Conceptual framework**




Source: Authors' elaboration, based on the GEM methodology (see Bosma *et al.*, 2020).

**Table 1: Summary statistics, by country**

| Country | Ratio of Entrepreneurs | Age | Male | Secondary school | Observations |
|---|---|---|---|---|---|
| **Italy** | 0.04 | 45.45 | 0.48 | 0.76 | 9,052 |
| **Russia** | 0.05 | 43.69 | 0.51 | 0.69 | 15,731 |
| **France** | 0.05 | 45.2 | 0.5 | 0.7 | 10,928 |
| **Spain** | 0.05 | 44.55 | 0.55 | 0.6 | 126,528 |
| **Slovenia** | 0.05 | 45.17 | 0.51 | 0.66 | 11,912 |
| **Belgium** | 0.06 | 45.73 | 0.52 | 0.48 | 6,821 |
| **United Kingdom** | 0.06 | 45.93 | 0.46 | 0.53 | 27,422 |
| **Denmark** | 0.06 | 42.86 | 0.5 | 0.66 | 2,217 |
| **Germany** | 0.06 | 45.36 | 0.55 | 0.77 | 26,785 |
| **Finland** | 0.06 | 45.34 | 0.54 | 0.75 | 11,017 |
| **Macedonia** | 0.06 | 44.52 | 0.46 | 0.61 | 7,991 |
| **Greece** | 0.07 | 44.13 | 0.53 | 0.48 | 10,904 |
| **Switzerland** | 0.07 | 44.58 | 0.53 | 0.78 | 11,350 |
| **Sweden** | 0.07 | 46.39 | 0.52 | 0.58 | 16,817 |
| **Norway** | 0.07 | 45.09 | 0.55 | 0.58 | 10,923 |
| **Portugal** | 0.08 | 43.12 | 0.55 | 0.44 | 11,026 |
| **Ireland** | 0.08 | 45.1 | 0.49 | 0.58 | 10,840 |
| **Croatia** | 0.08 | 45.16 | 0.49 | 0.7 | 10,936 |
| **Bosnia and Herzegovina** | 0.08 | 45.3 | 0.51 | 0.82 | 9,164 |
| **Czech Republic** | 0.08 | 43.59 | 0.46 | 0.76 | 7,004 |
| **Hungary** | 0.09 | 44.27 | 0.52 | 0.64 | 10,879 |
| **Austria** | 0.09 | 44.59 | 0.49 | 0.77 | 4,548 |
| **Poland** | 0.09 | 43.82 | 0.53 | 0.61 | 8,915 |
| **Netherlands** | 0.10 | 45.38 | 0.53 | 0.75 | 13,644 |
| **Romania** | 0.10 | 44.15 | 0.56 | 0.71 | 6,977 |
| **Luxembourg** | 0.10 | 44.99 | 0.59 | 0.5 | 4,945 |
| **Lithuania** | 0.10 | 43.31 | 0.51 | 0.56 | 6,846 |
| **Slovakia** | 0.11 | 43.32 | 0.55 | 0.76 | 8,940 |
| **United States** | 0.12 | 46.29 | 0.55 | 0.49 | 20,739 |
| **Australia** | 0.12 | 45.25 | 0.49 | 0.56 | 3,994 |
| **Latvia** | 0.12 | 43.84 | 0.48 | 0.64 | 10,005 |
| **Canada** | 0.13 | 46.4 | 0.58 | 0.51 | 8,293 |
| **Estonia** | 0.13 | 44.81 | 0.55 | 0.61 | 7,199 |
| **Montenegro** | 0.15 | 43.59 | 0.51 | 0.87 | 2,000 |
| **Mean** | 0.07 | 43.98 | 0.53 | 0.65 | |
| **Std.Dev.** | 0.25 | 28.14 | 0.50 | 0.48 | |

Note: The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years old residing in the listed countries. The sample consists of 391,904 individuals. Entrepreneurs are defined according to the TEA index. Age is measured in years. Male is a dummy variable that takes value 1 for men, 0 for women. Secondary school is a dummy variable that takes value 1 for individuals whose maximum education level is compulsory secondary education, 0 otherwise.

**Table 2: Cultural variables, by country**

| Country | A48 | A49 | A50 | A51 | A52 |
|---|---|---|---|---|---|
| **Italy** | 2.63 | 2.7 | 2.28 | 2.89 | 2.67 |
| **Russia** | 2.42 | 2.62 | 2.47 | 3.04 | 2.68 |
| **France** | 2.35 | 2.13 | 1.85 | 2.53 | 2.48 |
| **Spain** | 3.04 | 2.77 | 2.32 | 2.63 | 2.88 |
| **Slovenia** | 2.60 | 2.73 | 2.05 | 3.12 | 2.84 |
| **Belgium** | 2.52 | 2.61 | 2.08 | 2.84 | 2.8 |
| **United Kingdom** | 3.18 | 2.66 | 2.21 | 2.85 | 2.88 |
| **Denmark** | 2.25 | 2.33 | 2.03 | 2.5 | 2.44 |
| **Germany** | 2.95 | 2.86 | 2.55 | 2.39 | 2.57 |
| **Finland** | 3.54 | 3.52 | 2.7 | 3.43 | 3.79 |
| **Macedonia** | 3.21 | 2.97 | 2.68 | 3.15 | 3.19 |
| **Greece** | 2.96 | 3.04 | 2.61 | 3.49 | 2.79 |
| **Switzerland** | 3.11 | 3.44 | 2.30 | 2.83 | 2.62 |
| **Sweden** | 2.74 | 3.16 | 2.28 | 3.16 | 3.01 |
| **Norway** | 3.05 | 3.02 | 2.81 | 3.16 | 2.99 |
| **Portugal** | 2.59 | 2.68 | 2.46 | 2.83 | 2.68 |
| **Ireland** | 3.71 | 3.29 | 3.18 | 3.45 | 3.21 |
| **Croatia** | 2.02 | 2.07 | 1.99 | 2.92 | 2.2 |
| **Bosnia and Herzegovina** | 2.36 | 2.38 | 2.27 | 2.81 | 2.62 |
| **Czech Republic** | 2.23 | 2.29 | 2.14 | 2.37 | 2.29 |
| **Hungary** | 2.13 | 2.21 | 2.11 | 2.23 | 2.32 |
| **Austria** | 2.61 | 2.37 | 1.88 | 2.81 | 2.44 |
| **Poland** | 3.44 | 3.05 | 2.56 | 3.02 | 3.11 |
| **Netherlands** | 2.92 | 3.50 | 2.59 | 3.29 | 3.64 |
| **Romania** | 2.74 | 2.88 | 2.63 | 2.81 | 2.83 |
| **Luxembourg** | 3.06 | 3.06 | 2.81 | 3.06 | 3.18 |
| **Lithuania** | 2.83 | 2.86 | 2.37 | 2.71 | 3.03 |
| **Slovakia** | 4.62 | 4.37 | 4.18 | 4.22 | 4.22 |
| **United States** | 3.39 | 3.52 | 2.88 | 3.45 | 3.64 |
| **Australia** | 2.41 | 2.48 | 2.23 | 2.55 | 2.54 |
| **Latvia** | 3.82 | 3.84 | 3.32 | 3.87 | 3.83 |
| **Canada** | 3.03 | 3.22 | 2.63 | 3.19 | 3.16 |
| **Estonia** | 3.92 | 4.32 | 3.31 | 3.93 | 4.56 |
| **Montenegro** | 2.49 | 2.51 | 2.45 | 2.43 | 2.56 |
| **Mean** | 2.94 | 2.94 | 2.51 | 2.99 | 2.95 |
| **Std. Dev.** | 0.85 | 0.83 | 0.74 | 0.77 | 0.81 |

Notes: The sample (GEM NES from years 2010 to 2015) has been restricted to the listed countries. A48 indicates whether the national culture is highly supportive of individual success achieved through own personal efforts. A49 indicates whether the national culture emphasizes self-sufficiency, autonomy, and personal initiative. A50 indicates whether the national culture encourages entrepreneurial risk-taking. A51 indicates whether the national culture encourages creativity and innovation. A52 indicates whether the culture emphasizes the responsibility of the individual (rather than the collective) in managing his or her own life. These variables take values from 1 (“total disagreement”) to 9 (“total agreement”).

**Table 3: The effect of culture on entrepreneurial decisions**

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Cultural Environment** | 0.050*** | 0.053*** | 0.020** | 0.022*** |
| | (0.003) | (0.003) | (0.010) | (0.008) |
| **Institutional Environment** | -0.041*** | - | 0.000 | - |
| | (0.004) | | (0.013) | |
| **Commercial Access** | 0.025*** | - | 0.013 | - |
| | (0.003) | | (0.010) | |
| **Financial Environment** | 0.009*** | - | 0.032*** | - |
| | (0.003) | | (0.012) | |
| **Entrepreneurial Education** | 0.052*** | - | 0.009 | - |
| | (0.003) | | (0.010) | |
| **Internal Markets** | 0.011*** | - | -0.001 | - |
| | (0.004) | | (0.014) | |
| **Age** | 0.049*** | 0.047*** | 0.050*** | 0.050*** |
| | (0.003) | (0.003) | (0.003) | (0.003) |
| **$Age^2/100$** | -0.074*** | -0.072*** | -0.076*** | -0.076*** |
| | (0.003) | (0.003) | (0.003) | (0.003) |
| **Male** | 0.303*** | 0.300*** | 0.301*** | 0.301*** |
| | (0.007) | (0.007) | (0.008) | (0.008) |
| **Secondary School** | -0.143*** | -0.141*** | -0.149*** | -0.148*** |
| | (0.007) | (0.007) | (0.008) | -0.008 |
| **Country fixed effects** | No | No | Yes | Yes |
| **Year fixed effects** | No | No | Yes | Yes |
| **$R^2$** | 0.0365 | 0.0335 | 0.0476 | 0.0475 |
| **Wald-test** | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Observations** | 391,904 | 391,904 | 391,904 | 391,904 |

Notes: Robust standard errors are in parentheses. The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years old residing in the countries listed in Table 1. The dependent variable takes value 1 when individuals are entrepreneurs, 0 otherwise. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.

**Table 4: Robustness checks**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **Cultural Environment** | 0.023*** | 0.022*** | 0.023*** | 0.019** | 0.026** | 0.024*** | 0.028** |
| | (0.008) | (0.008) | (0.008) | (0.010) | (0.013) | (0.008) | (0.012) |
| **Institutional Environment** | - | - | - | - | - | - | 0.040** |
| | | | | | | | (0.017) |
| **Commercial Access** | - | - | - | - | - | - | 0.072*** |
| | | | | | | | (0.013) |
| **Financial Environment** | - | - | - | - | - | - | 0.029* |
| | | | | | | | (0.015) |
| **Entrepreneurial Education** | - | - | - | - | - | - | 0.038*** |
| | | | | | | | (0.012) |
| **Internal Markets** | - | - | - | - | - | - | 0.001 |
| | | | | | | | (0.018) |
| **Age** | 0.040*** | 0.050*** | 0.039*** | 0.068*** | 0.104*** | 0.049*** | 0.095*** |
| | (0.003) | (0.003) | (0.003) | (0.009) | (0.029) | (0.003) | (0.011) |
| **Age$^2$/100** | -0.063*** | -0.075*** | -0.062*** | -0.102*** | -0.126*** | -0.075*** | -0.203*** |
| | (0.004) | (0.003) | (0.004) | (0.013) | (0.026) | (0.003) | (0.020) |
| **Male** | 0.325*** | 0.303*** | 0.329*** | 0.300*** | 0.300*** | 0.261*** | 0.244*** |
| | (0.009) | (0.008) | (0.009) | (0.010) | (0.013) | (0.008) | (0.010) |
| **Secondary School** | -0.160*** | -0.145*** | -0.156*** | -0.139*** | -0.166*** | -0.139*** | -0.088*** |
| | (0.008) | (0.008) | (0.009) | (0.009) | (0.013) | (0.008) | (0.010) |
| **Large Family** | - | - | - | - | - | 0.057*** | - |
| | | | | | | (0.011) | |
| **Middle Income** | - | - | - | - | - | -0.086*** | - |
| | | | | | | (0.010) | |
| **Homemaker** | - | - | - | - | - | -0.550*** | - |
| | | | | | | (0.026) | |
| **Country fixed effects** | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Year fixed effects** | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **$R^2$** | 0.0482 | 0.0475 | 0.0475 | 0.0319 | 0.0503 | 0.0520 | 0.0630 |
| **Wald-test** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Observations** | 278,431 | 367,967 | 254,494 | 215,594 | 176,310 | 391,904 | 156,814 |

Notes: Robust standard errors in parentheses. The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years old residing in the countries listed in Table 1. The dependent variable takes value 1 when individuals are entrepreneurs, 0 otherwise. We exclude Spanish individuals in Column (1), German individuals in column (2), and both in column (3). Column (4) is restricted to individuals between 25 and 46 years old. Column (5) only includes individuals between 47 and 65 years old. The set of individual characteristics has been enlarged in column (6). In column (7), we only include individuals younger than 36, and the dependent variable has been redefined and takes value 1 when individuals intend to entrepreneur in the future, 0 otherwise. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.

**Table 5: Collectivist vs individualist countries**

| Variables | (1) Collectivist Countries | (2) Individualist Countries | (3) Mediterranean Countries | (4) Anglo-Saxon Countries |
|---|---|---|---|---|
| **Cultural Environment** | 0.038*** | 0.013 | 0.026** | -0.035 |
| | (0.011) | (0.011) | (0.012) | (0.026) |
| **Age** | 0.056*** | 0.047*** | 0.064*** | 0.060*** |
| | (0.004) | (0.004) | (0.005) | (0.008) |
| **Age$^2$/100** | -0.087*** | -0.068*** | -0.094*** | -0.080*** |
| | (0.005) | (0.005) | (0.005) | (0.009) |
| **Male** | 0.294*** | 0.309*** | 0.287*** | 0.274*** |
| | (0.011) | (0.011) | (0.012) | (0.020) |
| **Secondary School** | -0.141*** | -0.159*** | -0.113*** | -0.129*** |
| | (0.010) | (0.011) | (0.012) | (0.020) |
| **Country F.E.** | Yes | Yes | Yes | Yes |
| **Year F.E.** | Yes | Yes | Yes | Yes |
| **$R^2$** | 0.0521 | 0.0413 | 0.0442 | 0.0333 |
| **Wald-test** | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **N. Observations** | 226,121 | 165,783 | 184,983 | 51,199 |

Notes: Robust standard errors in parentheses. The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years old, residing in the countries listed in Table 1. The dependent variable takes value 1 when individuals are entrepreneurs, 0 otherwise. Column (1) has been restricted to collectivist countries. Column (2) has been restricted to individualist countries. Column (3) has been restricted to Mediterranean countries. Column (4) has been restricted to Anglo Saxon countries. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.

**Appendix A: GEM NES Variable description**

A1. In my country, there is sufficient equity funding available for new and growing firms.

A2. In my country, there is sufficient debt funding available for new and growing firms.

A3. In my country, there are sufficient government subsidies available for new and growing firms.

A4. In my country, there is sufficient funding available from informal investors.

A5. In my country, there is sufficient funding available from professional Businesses.

A6. In my country, there is sufficient venture capital funding available for new and growing firms.

A7. In my country, Government policies (e. g., public procurement) consistently favor new firms.

A8. In my country, the support for new and growing firms is a high priority for policy at the national government level.

A9. In my country, the support for new and growing firms is a high priority for policy at the local government level.

A10. In my country, new firms can get most of the required permits and licenses in about a week.

A11. In my country, the level of taxation is not a burden for new and growing firms.

A12. In my country, taxes and other government regulations are applied to new and growing firms in a predictable and consistent way.

A13. In my country, coping with government bureaucracy, regulations, and licensing requirements is not unduly difficult for new and growing firms.

A14. In my country, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency.

A15. In my country, science parks and business incubators provide effective support for new and growing firms.

A16. In my country, there are an adequate number of government programs for new and growing businesses.

A17. In my country, the people working for government agencies are competent and effective in supporting new and growing firms.

A18. In my country, almost anyone who needs help from a government program for a new or growing business can find what they need.

A19. In my country, Government programs aimed at supporting new and growing firms are effective.

A20. In my country, teaching in primary and secondary education encourages creativity, self-sufficiency, and personal initiative.

A21. In my country, teaching in primary and secondary education provides adequate instruction in market economic principles.

A22. In my country, teaching in primary and secondary education pays adequate attention to entrepreneurship and new firm creation.

A23. In my country, Colleges and universities provide good and adequate preparation for starting up and growing new firms.

A24. In my country, the level of business and management education provides good and adequate preparation for starting up and growing new firms.

A25. In my country, the vocational, professional, and continuing education systems provide good and adequate preparation for starting up and growing new firms.

A26. In my country, new technology, science, and other knowledge basesare efficiently transferred from universities and public research centers to new and growing firms.

A27. In my country, new and growing firms have just as much access to new research and technology as large, established firms.

A28. In my country, new and growing firms can afford the latest technology.

A29. In my country, there are adequate government subsidies for new and growing firms to acquire new technology.

A30. In my country, the science and technology base efficiently supports the creation of world-class, new technology-based ventures in at least one area.

A31. In my country, there is good support available for engineers and scientists to have their ideas commercialized through new and growing firms.

A32. In my country, there are enough subcontractors, suppliers, and consultants to support new and growing firms.

A33. In my country, new and growing firms can afford the cost of using subcontractors, suppliers, and consultants.

A34. In my country, it is easy for new and growing firms to get good subcontractors, suppliers, and consultants.

A35. In my country, it is easy for new and growing firms to get good, professional legal and accounting services.

A36. In my country, it is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit, and the like).

A37. In my country, the markets for consumer goods and services change dramatically from year to year.

A38. In my country, the markets for business-to-business goods and services change dramatically from year to year.

A39. In my country, new and growing firms can easily enter new markets.

A40. In my country, the new and growing firms can afford the cost of market entry.

A41. In my country, new and growing firms can enter markets without being unfairly blocked by established firms.

A42. In my country, the anti-trust legislation is effective and well-enforced.

A43. In my country, the physical infrastructure (roads, utilities, communications, wastedisposal) provides good support for new and growing firms.

A44. In my country, it is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc).

A45. In my country, a new or growing firm can get good access to communications (telephone, internet, etc.) in about a week.

A46. In my country, new and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer).

A47. In my country, new or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month.

A48. In my country, the national culture is highly supportive of individual success achieved through own personal efforts.

A49. In my country, the national culture emphasizes self-sufficiency, autonomy, and personal initiative.

A50. In my country, the national culture encourages entrepreneurial risk-taking.

A51. In my country, the national culture encourages creativity and innovation.

A52. In my country, the national culture emphasizes the responsibility of the individual (rather than the collective) in managing his or her own life.

## Appendix B: Additional results

**Figure B1: Scree graph**

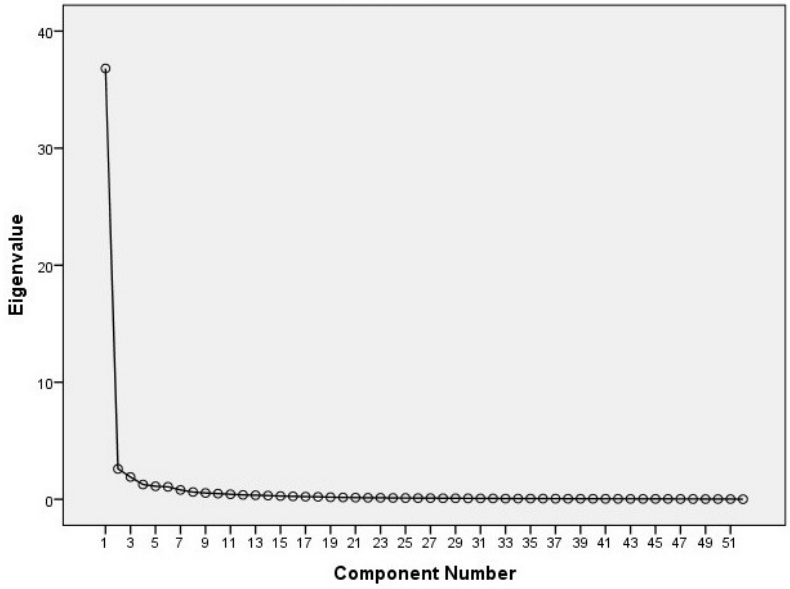


**Table B1: Summary statistics of NES variables**

| | Mean | Std. Dev. | | Mean | Std. Dev. |
|---|---|---|---|---|---|
| **A1** | 2.893 | 0.757 | **A27** | 2.438 | 0.601 |
| **A2** | 2.970 | 0.751 | **A28** | 2.415 | 0.615 |
| **A3** | 3.069 | 0.811 | **A29** | 2.649 | 0.661 |
| **A4** | 2.736 | 0.811 | **A30** | 3.157 | 0.876 |
| **A5** | 2.773 | 0.762 | **A31** | 2.813 | 0.775 |
| **A6** | 2.508 | 0.861 | **A32** | 3.735 | 0.833 |
| **A7** | 2.201 | 0.589 | **A33** | 2.697 | 0.564 |
| **A8** | 3.016 | 0.826 | **A34.** | 3.166 | 0.696 |
| **A9** | 2.944 | 0.767 | **A35** | 3.810 | 0.778 |
| **A10** | 2.314 | 0.798 | **A36** | 3.707 | 0.879 |
| **A11** | 2.636 | 0.798 | **A37** | 3.092 | 0.773 |
| **A12** | 2.862 | 0.876 | **A38** | 3.038 | 0.728 |
| **A13** | 2.545 | 0.778 | **A39** | 2.868 | 0.672 |
| **A14** | 2.620 | 0.787 | **A40** | 2.641 | 0.586 |
| **A15** | 3.394 | 0.861 | **A41** | 2.890 | 0.692 |
| **A16** | 3.140 | 0.806 | **A42** | 3.070 | 0.838 |
| **A17** | 2.858 | 0.729 | **A43** | 3.715 | 1.054 |
| **A18** | 2.697 | 0.685 | **A44** | 4.192 | 0.927 |
| **A19** | 2.777 | 0.691 | **A45** | 4.202 | 1.006 |
| **A20** | 2.520 | 0.664 | **A46** | 4.102 | 0.890 |
| **A21** | 2.292 | 0.582 | **A47** | 4.136 | 1.010 |
| **A22** | 2.060 | 0.570 | **A48** | 2.936 | 0.852 |
| **A23** | 2.737 | 0.643 | **A49** | 2.942 | 0.828 |
| **A24** | 3.204 | 0.690 | **A50** | 2.509 | 0.736 |
| **A25** | 2.955 | 0.654 | **A51** | 2.991 | 0.772 |
| **A26** | 2.580 | 0.677 | **A52** | 2.954 | 0.811 |

Note: The sample (GEM NES from years 2010 to 2015) has been restricted to the countries listed in Table 1. These variables take values from 1 ("total disagreement") to 9 ("total agreement").

**Table B2: Total variance explained**

| Component | Eigenvalue | % Variance | Cumulative % |
|---|---|---|---|
| **1** | 36.811 | 70.790 | 70.790 |
| **2** | 2.598 | 4.996 | 75.786 |
| **3** | 1.904 | 3.662 | 79.447 |
| **4** | 1.269 | 2.440 | 81.887 |
| **5** | 1.111 | 2.136 | 84.023 |
| **6** | 1.068 | 2.053 | 86.077 |

Note: The sample (GEM NES from years 2010 to 2015) has been restricted to the countries listed in Table 1. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 10 iterations.

**Table B3: Rotated Component Matrix**

| | Principal Component | | | | | |
|---|---|---|---|---|---|---|
| **Variables** | **1** | **2** | **3** | **4** | **5** | **6** |
| **A1** | 0.410 | 0.418 | | 0.516 | | |
| **A2** | | | | 0.458 | | |
| **A3** | 0.699 | | | | | |
| **A4** | | 0.497 | 0.420 | 0.500 | | |
| **A5** | 0.468 | 0.486 | 0.463 | 0.426 | | |
| **A6** | | 0.455 | 0.544 | | | |
| **A7** | 0.544 | | | 0.564 | | |
| **A8** | 0.768 | | | | | |
| **A9** | 0.727 | | | | | |
| **A10** | 0.582 | | | | 0.522 | |
| **A11** | 0.642 | | | | 0.415 | |
| **A12** | 0.686 | 0.439 | | | | |
| **A13** | 0.708 | | | | 0.448 | |
| **A14** | 0.802 | | | | | |
| **A15** | 0.731 | | 0.426 | | | |
| **A16** | 0.790 | | | | | |
| **A17** | 0.775 | | | | | |
| **A18** | 0.787 | | | | | |
| **A19** | 0.756 | | | | | |
| **A20** | | 0.545 | | | 0.562 | |
| **A21** | | | | 0.406 | 0.671 | |
| **A22** | | | | | 0.703 | |
| **A23** | | | | 0.506 | | |
| **A24** | | | | 0.564 | | |
| **A25** | 0.406 | 0.408 | | 0.494 | | |
| **A26** | 0.544 | 0.410 | | 0.548 | | |
| **A27** | 0.496 | | | 0.563 | | |
| **A28** | | | | 0.701 | | |
| **A29** | 0.687 | | | 0.462 | | |
| **A30** | 0.536 | 0.441 | 0.504 | | | |
| **A31** | 0.659 | 0.452 | 0.401 | | | |
| **A32** | 0.511 | | 0.578 | | | |
| **A33** | 0.465 | | | 0.543 | | |
| **A34** | 0.415 | | 0.556 | 0.471 | | |
| **A35** | 0.401 | | 0.563 | 0.402 | | |
| **A36** | | | 0.475 | | 0.500 | |
| **A37** | | | | | | 0.909 |
| **A38** | | | | | | 0.910 |
| **A39** | 0.405 | 0.451 | 0.451 | 0.442 | | |
| **A40** | 0.427 | 0.421 | | 0.511 | | |
| **A41** | 0.494 | | 0.444 | 0.493 | | |
| **A42** | 0.609 | | 0.462 | | | |
| **A43** | 0.622 | | 0.570 | | | |
| **A44** | | | 0.654 | | | 0.449 |
| **A45** | | | 0.635 | | | 0.512 |
| **A46** | 0.432 | | 0.680 | | | |
| **A47** | 0.467 | | 0.705 | | | |
| **A48** | | 0.769 | | | | |
| **A49** | | 0.730 | | | | |
| **A50** | | 0.814 | | | | |
| **A51** | | 0.704 | | | | |
| **A52** | | 0.701 | | | | |

Note: The sample (GEM NES from years 2010 to 2015) has been restricted to the countries listed in Table 1. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 10 iterations. Correlates under 0.4 have been suppressed for simplicity.