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# The effect of cultural environment on entrepreneurial decisions

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## Abstract

This paper empirically examines whether the cultural environment plays a role in entrepreneurial decisions in Europe, the United States, Canada, and Australia. To explore this issue, we use data from the Adult Population Survey (APS) of 2010 to 2015 provided by the Global Entrepreneurship Monitor (GEM). To calculate the cultural factor, we utilize data from the GEM National Expert Survey (NES) data and apply a probit model to measure the effect of culture based on an unobserved latent variable of satisfaction, measured through a dichotomous variable identifying entrepreneurs. Results show a positive and statistically significant relationship between the cultural factor and the individual choice of entrepreneurial activity, suggesting that cultural environment is important, especially in European and Mediterranean countries. Our findings are robust to the introduction of several country variables, and to the use of different subsamples. Further, they do not qualitatively depend on the age of individuals.

Keywords: Entrepreneurship. Culture. Developed countries. GEM Data.

JEL Codes: J24, Z13

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## 1. INTRODUCTION

This paper addresses the effect of the cultural environment on entrepreneurial decisions, using data from the Global Entrepreneurship Monitor (GEM), from years 2010 to 2015, for developed economies. The data provided by GEM allows us to identify entrepreneurs as those individuals who contribute to the “Total (early-stage) Entrepreneurial Activity” (TEA) index, i.e., individuals “who are about to start, or have started an entrepreneurial activity in the last 42 months”. This characterization of entrepreneurs 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; Gimenez-Nadal et al., 2011; Camapaña et al., 2017a, 2017b, 2017c; Velilla, 2017).

In developing economies, there has been an increasing interest in the promotion of entrepreneurship in recent years, in order to promote growth and household welfare, and fight unemployment and poverty (Acs, 1992; Audretsch, 2007; Naudé et al., 2008; Naudé, 2010; Minniti, and Naudé, 2010; Allen and Langowitz, 2011; Molina and Velilla, 2016). However, several differences can be appreciated among the percentage of entrepreneurs across developed countries. Figure 1 shows the proportion of entrepreneurs, by country, in the year 2015. As can be seen, there are considerable dissimilarities among countries, ranging from a minimum proportion of 0.046 in Germany to a maximum of 0.147 in Canada. In consequence, several researchers have focused on studying entrepreneurial activity in recent years. Torrini (2005) analyzes the role of taxation and tax evasion opportunities in entrepreneurial decisions, pointing to the institutional environment as an important element in determining the large disparities observed in entrepreneurship rates across countries. Similar conclusions are obtained by Gohmann (2012), who shows the positive effect of economic freedom on entrepreneurship. Yu (1998) and Bjornskov and Foss (2006) find that the size of Government, the nature of the monetary policy, and the financial environment are strong determinants of entrepreneurship. Differences in the economic conditions of countries can also have implications for individual decisions related to entrepreneurial activity (Evans and Jovanovic, 2002; Storey and Johnson 1987; Thurik et al., 2008; Wennekers and Thurik, 1999). Several works have used micro-data to identify the socio-economic characteristics of entrepreneurs, such as age, formal education, work status, and income (Blanchflower, 2004; Evans and Leighton, 1989; Parker and Robson, 2004). Keeble et al. (1993) and Velilla and Ortega (2017) suggest that education may lead to entrepreneurial opportunities, and then to higher levels of entrepreneurship. Other studies have examined the connection between racial differences and entrepreneurship, finding that black

entrepreneurs are more likely than whites to fail in the early stage of the entrepreneurial process (Koellinger and Minniti, 2006) even though many of the factors mentioned above may be in play. Nevertheless, it is also possible to conjecture that the cultural environment of each country has contributed to increase the differences observed in entrepreneurship rates across countries (see, e.g., Acs, 1992; Minniti, 2005; Cooper and Yin, 2005). In this paper, we contribute to these lines of research by exploring the different factors affecting entrepreneurship, with special attention on the effect of the cultural environment on entrepreneur decisions.

We do not claim to be the first empirical study of the cultural factors related to entrepreneurship. However, to our knowledge, this is the first empirical work that clusters a wide range of variables provided by the GEM National Expert Survey (NES) to obtain a cultural indicator, and then apply this indicator to the APS, using a probit model. Using a similar approach, Marcen (2014) finds a positive relationship between the entrepreneurial decisions of second-generation immigrants in the US and 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. Fairly recent studies have also examined the effect of culture on socioeconomic and demographic variables, such as unemployment (Brügger et al., 2009), the search for a job (Eugster et al., 2016), marriage and cohabitation (Marcen and Morales, 2017) and fertility decisions (Marcen et al., 2017). Our work contributes to this line of research by determining the importance of the cultural environment on entrepreneurial decisions.

We use micro-data from the Adult Population Survey (APS) from years 2010 to 2015, restricting the sample to those individuals residing in developed economies in Europe, the United States, Canada, and Australia. To calculate the cultural factor, we use data from the GEM NES from 2010 to 2015. The Global Entrepreneurship Monitor (GEM) is the most important study of entrepreneurship in the world, and a recent review of GEM can be read in Stephan et al. (2015).

First, we carry out a factorial analysis that allows us to cluster the wide range of national variables provided by GEM in different factors. After that, we analyze the effect of these factors on entrepreneurial decisions of individuals in our sample. Among these factors, we focus on the cultural environment in each country. Our results point to the cultural environment as an important determinant of entrepreneurial decisions, suggesting that those individuals living in countries where the social norm promotes entrepreneurial activities are more likely to become

an entrepreneur. Additionally, this effect appears to be greater in European and, in particular, Mediterranean countries. Our results are robust to the control of unobservable characteristics, by including country fixed effects and year fixed effects.

The remainder of the paper is organized as follows. Section 2 presents the data. Section 3 describes the empirical strategy. Our results are discussed in Section 4, and Section 5 concludes.

## **2. DATA**

We use data from the Global Entrepreneurship Monitor (GEM), the world's foremost study of entrepreneurship. This data source provides high-quality information allowing us to study why in some countries there are more entrepreneurs than in others. In each economy, GEM looks at two elements. The first is the entrepreneurial behaviour and attitudes of individuals, and the second is the national context and how that impacts entrepreneurship. In our empirical analysis, we use data on individuals between 25 and 65 years old from the Adult Population Survey (APS) for years 2010 to 2015. We also use data from the National Expert Survey (NES) to calculate the cultural factor. The NES provides information about nine dimensions (each dimension containing several variables) of the national context in which individuals establish businesses, and is based on aggregates of interviews and surveys filled out by 36 experts in each country. NES variables take values on a scale from 1 to 9, with 1 being total disagreement, and 9 being total agreement.

Our main sample contains 391,904 observations of individuals in 34 countries. The whole range of national variables provided by NES (see Appendix A), has been used to build our principal factors using factorial analysis. Our main explanatory variable, representing the cultural environment, is defined as the matching-up of national variables providing information about whether the national culture encourages entrepreneurial risk-taking, and/or is highly supportive of individual success achieved through own personal efforts, and/or emphasizes self-sufficiency, autonomy, and personal initiative, and/or encourages creativity and innovativeness, and/or emphasizes the responsibility of the individual (rather than the collective) in managing their own life.

Table 1 presents summary statistics for the relevant variables, ordered from the lowest to the highest proportion of entrepreneur. As can be seen, there are considerable differences in entrepreneurial levels among countries, ranging from 0.04 in Italy, to 0.15 in Montenegro. The

remaining columns describe other important variables of the sample. Looking at the third column, we can observe dissimilarities in the level of education in our sample. Overall, 65% of the individuals in the sample have completed Secondary School, ranging from 44% in Portugal, to 87% in Montenegro. Fewer differences can be observed in the gender composition and the age of individuals in our sample, as expected given the exogeneity of these variables. 53% of the sample are males, and the mean age is 44 years old. Table 2 shows information about the cultural variables, by country. There are large differences in the social environment in each country, and countries where individuals are not encouraged to entrepreneur show the lowest levels of all the cultural variables (e.g., Czech Republic, and Hungary). Against that, countries that favor entrepreneurial activity through culture show the highest levels of entrepreneurship (e.g., Estonia, and Slovakia). Thus, it is possible to argue that cultural environment has an effect on the entrepreneurial decision. (Table B1 in Appendix B shows the descriptive statistics of those variables for the national context.)

### 3. 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 factorial analysis allows us to cluster the large range of national variables provided by the NES data into a small set of (uncorrelated) factors. That way, the factor-clustering cultural variables will constitute our explanatory variable of interest, and will capture the cultural environment in each country and each year.

Once the cultural factor is defined, our goal is to study its effect on the entrepreneurial decisions of individuals, using data from the GEM APS. To that end, we propose a Probit model, which emerges from an underlying model of latent variables. 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 plays any role in this index, i.e., if it can be considered one of the features that define the index of satisfaction, then we would expect to observe that the cultural factor does have an effect on the probability of becoming an entrepreneur. Formally, we analyze this issue using the following equation:

$$Y_{ijt}^* = \beta_0 + \beta_1 \text{Cultural environment}_{jt} + \beta_2 X_{ijt} + \delta_k + \gamma_t + u_{ijt}, \quad (1)$$

where  $Y_{ijt}^*$  is the unobservable subjective index of satisfaction. This index can be represented by a dichotomous variable,  $Y_{ijt}$ , that takes value 1 when individual  $i$ , residing in country  $j$  at time  $t$ , is an entrepreneur, and 0 otherwise. According to this formulation, individual  $i$  will opt to be an entrepreneur if and only if  $Y_{ijt}^* > 0$  (or any other threshold). Hence, although we cannot know  $Y_{ijt}^*$  through  $Y_{ijt}$ , we can study whether it exceeds the threshold of interest that defines  $Y_{ijt}$ , which leads us to establish:

$$Y_{ijt}^* > 0 \Leftrightarrow Y_{ijt} = 1, \text{ and individual } i \text{ is an entrepreneur,}$$

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

Once the variable  $Y_{ijt}$  has been defined, we can propose the Probit model to estimate as follows:

$$\text{Probit}(p_{ijt}) = \beta_0 + \beta_1 C_{jt} + \beta_2 \mathbf{X}_{ijt} + \delta_k + \gamma_t + u_{ijt} \quad (2)$$

where  $p_{ijt}$  is defined as the probability of  $Y_{ijt} = 1$ .  $\delta_k$  and  $\gamma_t$  represent country fixed effects and year fixed effects, respectively, to control for potential unobservable.

As noted above, the main explanatory variable of interest is the cultural environment in country  $j$  and year  $t$ ,  $C_{jt}$ , that represents the cultural factor obtained after carrying out the factorial analysis. If culture plays a role, individuals from countries where society favors entrepreneurial activity should be more likely to be or become an entrepreneur, and we expect that  $\beta_1 > 0$ . The vector  $\mathbf{X}_{ijt}$  includes individual demographics, such as gender, age, and education (a dummy variable for whether individuals have completed secondary school).

## 4. RESULTS

### 4.1 Factorial Analysis

The first part of the empirical strategy is to perform a factorial analysis to cluster the wide range of available variables of the NES into a small group of factors. First, we study the appropriateness of this analysis by examining the correlations between the NES variables. We use the measure of sampling adequacy proposed by Kaiser, Meyer and Olkin (KMO), and Bartlett's test of sphericity. The value of the KMO is found to be 0.972, and Bartlett's Test of Sphericity rejects that the correlation matrix is the identity matrix. Then, these statistics show that there are significant relationships between the variables of the NES 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).

Once confirmed that the factorial analysis is suitable, we extract components using a principal component analysis (PCA). The number of factors to extract is not fixed *a priori*, and will be calculated according to the data. Eigenvalues and a visual examination point to six components from the NES data, which can be defined as follows: 1) The first is defined as a laws and institutions factor, since it is related to the involvement of governments, both in making programs aimed at helping new entrepreneurs as well as regulating the required permits and licenses for new and growing firms. 2) The second explains the business culture, since it is related to the social norm followed in different aspects of entrepreneurship; for example, whether the national culture defends autonomy and personal initiative. 3) The third is related to commercial access. The variables related to this factor take into account the degree of access to communications (telephony or internet), to suppliers, or to basic services such as gas, water, and electricity. 4) The fourth represents the financial environment, as it is 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) The fifth represents the level of business teaching in primary and secondary education. 6) The sixth represents the dynamics of the internal market.<sup>1</sup>

## 4.2 Main results

Table 3 presents the estimated coefficients of Equation (2). Column (1) shows that a better cultural environment is related to a greater probability of being an entrepreneur, controlling for the rest of the national factors. Results also suggest a positive relationship between the financial environment and the entrepreneurial decision, but the remaining explanatory factors are not significantly related to the probability of being or becoming an entrepreneur. Age appears to be related to entrepreneurship following an inverted U-shape (achieving the maximum at age 33). Since younger individuals may be more enthusiastic and prone to risk-taking, but entrepreneurial and managerial skills improve with age, our results are not surprising. With regard to 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 showing that highly educated individuals do not tend to become entrepreneurs in Europe. Finally, our estimates show that males are more likely than females to be or become

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<sup>1</sup> Table B2 in Appendix B presents the eigenvalues of the correlation matrix of components, as well as the percentages of variance explained, and Figure B1 shows the scree graph. The six factors explain 86.07% of the total variance of the data. Table B3 in Appendix B shows the (rotated) component matrix, with the correlations between principal factors and initial variables. Factors have been defined according to these correlations.



entrepreneurs (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; Marcen 2014; Artz 2016; Gimenez-Nadal et al. 2017; Molina et al. 2016, 2017).

With respect to our variable of interest, the cultural environment, we observe that an increase of one percentage point of this factor, is associated with an increase of 0.22 points in the probit function of the probability of being an entrepreneur (Column (2) of Table 2). This effect is slightly higher when we only include individuals residing in European countries (Column (3)), and again higher when the sample is limited to Mediterranean countries (Column (4)). These results suggest that culture plays a more important role in European and, especially, in Mediterranean countries, than in the rest of the analyzed regions. This could be due to the fact that family and community networks constitute a more important source in these countries, and individuals residing there may be more sensitive to a national culture emphasizing (or not) self-sufficiency or innovation, for example.

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. Results can be observed in columns (1) to (3) of Table 4. Estimates do not significantly vary. Additionally, we have divided the sample in two groups, according to age, to study entrepreneurship for younger and older individuals (Molina et al. 2017b). First, we include only those individuals between 25 and 46 years in Column (4), and individuals between 47 and 65 in Column (5). Although estimated parameters vary from Column (4) to Column (5), and it could be that the effect of culture increases with age, these estimates are not statistically different, according to a t-type test, and thus we can conclude that the effect of culture on entrepreneurship does not depend on the age of individuals. In Column (5), we enlarge the set of explanatory variables included in our estimations by 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.<sup>2</sup> Results do not qualitatively vary. We can also draw the same conclusions after redefining our dependent variable as the probability of expecting to start a business in the future, and limiting our sample to those individuals below the age of 36 (see Column (7)).

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<sup>2</sup> The GEM APS data classifies individuals in three categories, according to their income: low income level, middle income level, and high income level.

## 5. CONCLUSIONS

The aim of this paper is to analyze the effect of the cultural environment, in developed countries, on the individual choice to become an entrepreneur. Recent research has focused on the main factors affecting entrepreneur decisions, and we contribute to this literature, showing that the cultural environment may encourage individuals to become entrepreneurs, especially in European and Mediterranean countries. We perform a factorial analysis to define an index of cultural environment using data from the GEM NES from years 2010 to 2015, and we then propose a probit model on the probability of being an entrepreneur, in terms of the cultural factor, and a set of demographics.

Results show a positive and statistically significant effect of the cultural environment on the probability of being or becoming, an entrepreneur. Our estimates are robust to controls for unobservable characteristics by country of origin and year, to the use of different subsamples, and to the redefinition of our dependent variable. A more significant effect can be observed among older individuals, although the differences are not statistically significant, and we cannot conclude that the effect of culture on entrepreneurial decisions depends on the age of individuals. We also find that the cultural environment has a greater impact on those individuals originating from European and, especially, Mediterranean countries. The different pattern followed by some groups of countries should be taken into account, since individuals from these societies can be more affected by the entrepreneur policies established in their countries. Thus, policy-makers should consider these results in order to promote entrepreneurship through culture in Mediterranean countries, but using other channels in non-Mediterranean countries.

The empirical analysis has certain empirical limitations. The data is a cross-section and so we cannot talk about causal effects, and results are based only on conditional correlations. Further, even though we include country and year fixed effects to control for potential unobserved heterogeneity, we must acknowledge the role of the latter in our estimates. Finally, as has been noted in the text, the definition of entrepreneur is not standard in the literature. Given the use of GEM data, we have defined entrepreneurs in terms of the TEA index, the main indicator of the GEM. Nonetheless, we acknowledge that different characterizations may lead to different results.

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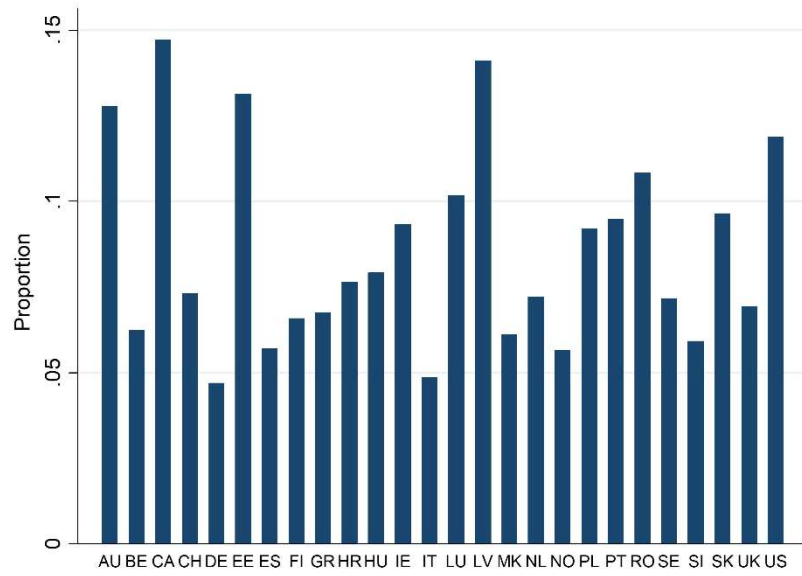
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**Figure 1: Proportion of entrepreneurs, by country**



Notes: The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years residing in the listed countries. Entrepreneurs are defined according to the TEA index.

**Table 1: Summary statistics by country**

Country	Ratio of Entrepreneurs	Age	Gender	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
UnitedKingdom	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
CzechRepublic	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	0.1	45.38	0.53	0.75	13.644
Romania	0.1	44.15	0.56	0.71	6.977
Luxembourg	0.1	44.99	0.59	0.5	4.945
Lithuania	0.1	43.31	0.51	0.56	6.846
Slovakia	0.11	43.32	0.55	0.76	8.940
UnitedStates	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
<b>Mean</b>	0.07	43.98	0.53	0.65	
<b>Std. Dev.</b>	0.25	28.14	0.50	0.48	

Notes: The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years residing in the listed countries. The sample consists of 391,904 individuals.



**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
UnitedKingdom	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
CzechRepublic	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
UnitedStates	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
<b>Average</b>	2.94	2.94	2.51	2.99	2.95
<b>Std.Dev.</b>	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 provides with information about whether the national culture is highly supportive of individual success achieved through own personal efforts. A49 shows whether the national culture emphasizes self-sufficiency, autonomy, and personal initiative. A50 shows whether the national culture encourages entrepreneurial risk-taking. A51 measures whether the national culture encourages creativity and innovation. A52 takes into account whether the culture emphasizes the responsibility of the individual (rather than the collective) in managing his or her own life.

**Table 3: The effect of culture on the entrepreneurial decision**

Dependent Variable: Probability of being an entrepreneur	(1)	(2)	(3)	(4)
<b>Cultural Environment</b>	0.020** (0.010)	0.022*** (0.008)	0.025*** (0.009)	0.026** (0.012)
<b>Institutional Environment</b>	0.000 (0.013)			
<b>Commercial Access</b>	0.013 (0.010)			
<b>Financial Environment</b>	0.032*** (0.012)			
<b>Entrepreneurial Education</b>	0.009 (0.010)			
<b>Internal Markets</b>	-0.001 (0.014)			
<b>Age</b>	0.050*** (0.003)	0.050*** (0.003)	0.050*** (0.003)	0.064*** (0.005)
<b>Age squared</b>	-0.076*** (0.003)	-0.076*** (0.003)	-0.076*** (0.003)	-0.094*** (0.005)
<b>Male</b>	0.301*** (0.008)	0.301*** (0.008)	0.315*** (0.008)	0.287*** (0.012)
<b>Secondary School</b>	-0.149*** (0.008)	-0.148*** (0.008)	-0.154*** (0.008)	-0.113*** (0.012)
<b>Country F.E.</b>	Yes	Yes	Yes	Yes
<b>Year F.E.</b>	Yes	Yes	Yes	Yes
<b>Observations</b>	391.904	391.904	355.833	184.983

Notes: The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years residing in the countries listed in Table 1. Robust clustered standard errors in parentheses. Age squared is defined as age<sup>2</sup>/100. \*\*\* Significant at the 1% level. \*\* Significant at the 5% level. \* Significant at the 10% level.

**Table 4: Robustness checks**

<b>Dependent Variable: Probability of being an entrepreneur</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>
<b>Cultural Environment</b>	0.023*** (0.008)	0.022*** (0.008)	0.023*** (0.008)	0.019** (0.010)	0.026** (0.013)	0.024*** (0.008)	0.028** (0.012)
<b>Institutional Environment</b>							0.040** (0.017)
<b>Commercial Access</b>							0.072*** (0.013)
<b>Financial Environment</b>							0.029* (0.015)
<b>Entrepreneurial Education</b>							0.038*** (0.012)
<b>Internal Markets</b>							0.001 (0.018)
<b>Age</b>	0.040*** (0.003)	0.050*** (0.003)	0.039*** (0.003)	0.068*** (0.009)	0.104*** (0.029)	0.049*** (0.003)	0.095*** (0.011)
<b>Age squared</b>	-0.063*** (0.004)	-0.075*** (0.003)	-0.062*** (0.004)	-0.102*** (0.013)	-0.126*** (0.026)	-0.075*** (0.003)	-0.203*** (0.020)
<b>Male</b>	0.325*** (0.009)	0.303*** (0.008)	0.329*** (0.009)	0.300*** (0.010)	0.300*** (0.013)	0.261*** (0.008)	0.244*** (0.010)
<b>Secondary School</b>	-0.160*** (0.008)	-0.145*** (0.008)	-0.156*** (0.009)	-0.139*** (0.009)	-0.166*** (0.013)	-0.139*** (0.008)	-0.088*** (0.010)
<b>Large Family</b>						0.057*** (0.011)	
<b>Middle Income</b>						-0.086*** (0.010)	
<b>Homemaker</b>						-0.550*** (0.026)	
<b>Country FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Year FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Observations</b>	278.431	367.967	254.494	215.594	176.310	391.904	156.814

Notes: The sample (GEM APS from years 2010 to 2015) has been restricted to individuals between 25 and 65 years residing in the countries listed in Table 1. Robust clustered standard errors in parentheses. 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. Column (5) only includes individuals between 46 and 65 years. 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 as the probability of being an entrepreneur in the future. Age squared is defined as  $age^2/100$ . \*\*\* 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 Business.

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 bases are 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, waste disposal) 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.

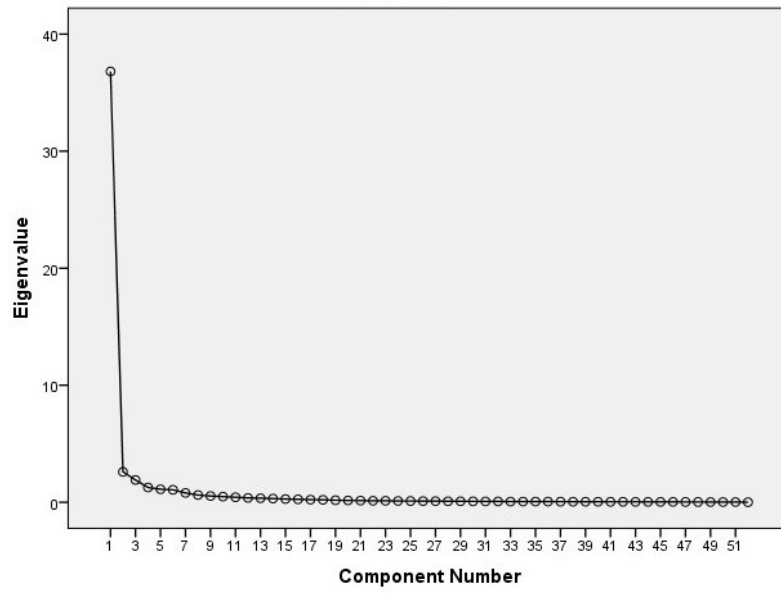
A50. In my country, the national culture encourages entrepreneurial risk-taking.

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: Descriptive Statistics of national variables**

	<b>Mean</b>	<b>Std. Dev.</b>	<b>N. Obs.</b>		<b>Mean</b>	<b>Std. Dev.</b>	<b>N. Obs.</b>
<b>A1</b>	2.8933	.75685	285	<b>A28</b>	2.4146	.61492	285
<b>A2</b>	2.9704	.75094	285	<b>A29</b>	2.6489	.66130	285
<b>A3</b>	3.0687	.81138	285	<b>A30</b>	3.1565	.87619	285
<b>A4</b>	2.7357	.81103	285	<b>A31</b>	2.8129	.77461	285
<b>A5</b>	2.7725	.76202	285	<b>A32</b>	3.7351	.83323	285
<b>A6</b>	2.5080	.86068	285	<b>A33</b>	2.6969	.56422	285
<b>A7</b>	2.2012	.58862	285	<b>A34</b>	3.1659	.69555	285
<b>A8</b>	3.0156	.82589	285	<b>A35</b>	3.8096	.77780	285
<b>A9</b>	2.9443	.76727	285	<b>A36</b>	3.7070	.87901	285
<b>A10</b>	2.3140	.79828	285	<b>A37</b>	3.0923	.77305	285
<b>A11</b>	2.6364	.79753	285	<b>A38</b>	3.0384	.72779	285
<b>A12</b>	2.8622	.87631	285	<b>A39</b>	2.8680	.67205	285
<b>A13</b>	2.5454	.77813	285	<b>A40</b>	2.6409	.58572	285
<b>A14</b>	2.6202	.78732	285	<b>A41</b>	2.8902	.69159	285
<b>A15</b>	3.3938	.86061	285	<b>A42</b>	3.0701	.83817	285
<b>A16</b>	3.1395	.80622	285	<b>A43</b>	3.7151	1.05413	285
<b>A17</b>	2.8582	.72872	285	<b>A44</b>	4.1918	.92659	285
<b>A18</b>	2.6972	.68480	285	<b>A45</b>	4.2019	1.00640	285
<b>A19</b>	2.7774	.69103	285	<b>A46</b>	4.1018	.89035	285
<b>A20</b>	2.5199	.66377	285	<b>A47</b>	4.1364	1.01004	285
<b>A21</b>	2.2915	.58210	285	<b>A48</b>	2.9362	.85214	285
<b>A22</b>	2.0596	.56982	285	<b>A49</b>	2.9423	.82817	285
<b>A23</b>	2.7370	.64322	285	<b>A50</b>	2.5091	.73588	285
<b>A24</b>	3.2037	.69008	285	<b>A51</b>	2.9908	.77185	285
<b>A25</b>	2.9550	.65376	285	<b>A52</b>	2.9536	.81146	285
<b>A26</b>	2.5803	.67698	285				
<b>A27</b>	2.4378	.60057	285				

**Table B2: Total Variance Explained**

Component	Total	Initial Eigenvalues	
		% 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

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 10 iterations.

**Table B3: Rotated Component Matrix**

	Component					
	1	2	3	4	5	6
A1	.410	.418		.516		
A2				.458		
A3	.699					
A4		.497	.420	.500		
A5	.468	.486	.463	.426		
A6		.455	.544			
A7	.544			.564		
A8	.768					
A9	.727					
A10	.582				.522	
A11	.642				.415	
A12	.686	.439				
A13	.708				.448	
A14	.802					
A15	.731		.426			
A16	.790					
A17	.775					
A18	.787					
A19	.756					
A20		.545			.562	
A21				.406	.671	
A22					.703	
A23				.506		
A24				.564		
A25	.406	.408		.494		
A26	.544	.410		.548		
A27	.496			.563		
A28				.701		
A29	.687			.462		
A30	.536	.441	.504			
A31	.659	.452	.401			
A32	.511		.578			
A33	.465			.543		
A34	.415		.556	.471		
A35	.401		.563	.402		
A36			.475		.500	
A37						.909
A38						.910
A39	.405	.451	.451	.442		
A40	.427	.421		.511		
A41	.494		.444	.493		
A42	.609		.462			
A43	.622		.570			
A44			.654			.449
A45			.635			.512
A46	.432		.680			
A47	.467		.705			
A48		.769				
A49		.730				
A50		.814				
A51		.704				
A52		.701				

Notes: 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.