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Entrepreneurial intention through the lens of the Pareto rule: A cross-country study

G. Morales-Alonso^{1*}, I. Pablo-Lerchundi², A. Ramírez-Portilla³ and J. Ordieres-Meré¹

Abstract: The overall economic progress of a society is highly dependent on the entrepreneurial action of its individuals. Entrepreneurial venture is governed by contextual, social, and individual drivers. Despite the many variables involved, we posit that cognitive traits (which belong to individual factors) are responsible for the largest share of antecedent entrepreneurial intentions. We look into this issue by means of a sample of 1901 respondents from four developed countries—Germany, Italy, Sweden, and Spain—combined with data from secondary sources. We find partial support for our hypothesis. While cognitive traits prove to be the most important drivers of entrepreneurial intention, they are only able to explain between 49% and 68% of its variability. Respondents have been divided into two partitions: a decile (10% highest to 10% lowest in entrepreneurial intention) and a quartile (25% highest to 25% lowest in entrepreneurial intention). Our results show that the highest entrepreneurial intention decile and quartile are populated by respondents springing from countries with lower development level, lower inequalities, lower economic freedom, higher exposure to catholic values, and higher values of the Masculinity/Femininity factor as defined by Hofstede.

Subjects: Economics; Finance; Business, Management and Accounting;

Keywords: Economic freedom; national culture; religiosity; inequality; Theory of Planned Behavior

1. Introduction

Entrepreneurial action, as a proxy of decisions made in the private sector, is driven by creativity, which is at the heart of dynamic market process (Kirzner, 1973). The rationale behind this assertion can be traced back to the definition of human action by Ludwig Von Mises (1949), for whom an economic agent can only succeed on his actions when he/she understands the existing relations between the ambited goals and the available means to achieve them. Entrepreneurial action is the driving force of economic development (Mcmullen & Shepherd, 2006), which is nothing other than the byproduct of achieving social cooperation within the context of a capitalist society (Espinosa et al., 2021; Holcombe, 2007).

The importance of matching macro and micro policies in order to foster entrepreneurship, as detailed by Bradley et al. (2021), reveals the complexity of the entrepreneurial ecosystem, which has been sought after both by practitioners and academic researchers. The Global Entrepreneurship Monitor (GEM), a practitioner think tank, supports the idea that entrepreneurial activity takes place within a specific context and in the presence of a given social, cultural, and

economic setting (GEM Consortium, 2021). That is, the entrepreneurial process is strongly linked with the location where it takes place, as the individual recognizes the opportunity and estimates his/her perceived ability to succeed in creating the new venture in a given institutional context. The factors of the institutional setting for entrepreneurship defined in the GEM conceptual framework are (i) social, cultural, political, and economic contexts (which we will refer to as contextual factors), (ii) societal values about entrepreneurship (which we refer to as social values), and (iii) individual attributes. The academic community agrees that entrepreneurship is a multi-level phenomenon in which the human action is embedded in the institutional and social contexts in which the individual is located (Boudreaux et al., 2019; McMullen & Shepherd, 2006; Meoli et al., 2020).

The GEM framework identifies institutional (contextual and social) factors as antecedents of entrepreneurial activity, but it does not explain how the decision to create a new venture is configured at an individual level; that is, how the action is planned. We know that, within the individual factors, (i) demographic attributes, (ii) human capital of the entrepreneur and (iii) existing cognitive traits play a role in entrepreneurial intention. The demographic attributes include age, gender, exposure to role models, education, and professional experience (Clarysse et al., 2011; Colombo & Grilli, 2010; Morales - Alonso et al., 2015; Morales-Alonso et al., 2016; Pablo-Lerchundi et al., 2015). Regarding human capital, researchers have proposed general education level, entrepreneurial, economic and managerial educations, applied technology education, and advanced university studies (Dileo & García Pereiro, 2019; Pena, 2004). Lastly, cognitive mechanisms can be studied through Ajzen's (1991) Theory of Planned Behavior (TPB), in which Attitude Towards the Behavior (ATB), Subjective Norm (SN) and Perceived Behavioral Control (PBC) are the governing factors. The TPB has proven its ability in predicting entrepreneurial intention (Kautonen et al., 2013, 2015; Krueger, 2000).

Recent research (Morales-Alonso et al., 2022) has shown that cognitive traits act as "the last mile" in the entrepreneurial decision process, while demographic and human capital factors appear to antecede them. Anchoring on these results, we state that entrepreneurial intention is a dimension driven by multiple variables. However, most multivariate problems match the Pareto principle by which 80% of a system's output is due to only 20% of its input. The research question that drives the present study is, "*Are cognitive traits the 20% of variables that drive the 80% of entrepreneurial intentions?*" In other words, are cognitive traits as defined in the TPB model able to override the importance of contextual and social factors as drivers of entrepreneurial aspirations? To answer this question, we gather both contextual and social factors (taken from secondary sources as panel data set) for entrepreneurship and psychological or cognitive factors (measured) according to the TPB model to see how they influence entrepreneurial intentions. A questionnaire was designed and administered to a sample of 1901 engineering students from Germany, Italy, Spain, and Sweden. Our sample is taken from developed countries, as one of the drivers of this research is to analyze the effect of national culture over entrepreneurial aspirations on these types of countries. By doing so, we respond to the call for more studies focusing on the moderating effect of contextual and social factors over entrepreneurial intentions (Donaldson, 2019).

Our findings highlight the existence of a hierarchy in the antecedents of entrepreneurial intention. Particularly, cognitive traits appear to play a major role in entrepreneurial intention. These results are relevant both for academia and practitioners. The former can account with this hierarchy when crafting frameworks in which several variables affect over entrepreneurial intention. For the latter, when public or private institutions try to foster entrepreneurship, they should be aware of the importance of cognitive traits over contextual and social factors.

The rest of this paper is organized as follows. The next section presents the research framework is presented, with the establishment of the hypotheses on which the entire study is based. Section 3 contains the research methodology, before the results are summarized in Section 4. The last section is devoted to the discussion of the results and the conclusions of the study.

2. Literature review

2.1. *The effect of contextual factors over entrepreneurship*

The context in which an individual lives—defined as situational opportunities and constraints that affect organizational behavior (Johns, 2006)—determines the attractiveness of creating a new venture (Crecente-Romero et al., 2016; Wannamakok & Liang, 2019). Krueger and Brazeal (1994) described the commitment to starting a new venture as “the entrepreneurial intention” (EI). We follow Nguyen (2018), who defined EI as “the conscious awareness and conviction by an individual to set up a new business venture and plans to do so in the future”. In this vein, the EI would be the detonating point of any entrepreneurial process, which is found to be affected by contextual (Amofah et al., 2020) and cognitive factors (Meoli et al., 2020).

We shall first look into the contextual factors for entrepreneurship. According to the GEM framework, the main contextual conditions are national and entrepreneurial framework conditions and include the economic context. However, developed and developing countries present different contexts, which, of course, affects entrepreneurship. Purchasing Power Parity (PPP), defined as per capita GDP, has shown to be reliable when comparing entrepreneurship at different levels of economic development (McMullen et al., 2008; Morales-Alonso et al., 2020; Wennekers et al., 2005).

Using data from the GEM, Wennekers et al. (2005) found that underdeveloped countries tend to profit from higher new ventures creation rates than developed countries. Scholars have found mixed results in this regard: in India, individuals from lower castes tend to avoid entrepreneurship (Audretsch et al., 2013), while an improved standard of living in Bosnia and Herzegovina fosters new venture creation (Turulja et al., 2020). Davey et al. (2011) reported that students from emerging economies are more likely to engage in entrepreneurship than students from developed countries. This can be attributed to a lack of employment opportunities in poorly organized job markets, which calls for self-employment as a good career option. The push versus pull motivations theory provides a framework that support this reality. Entrepreneurship can be driven by push (necessity, poverty, survivability) or pull motives (autonomy, income, wealth) (Martínez-Cañas et al., 2023).

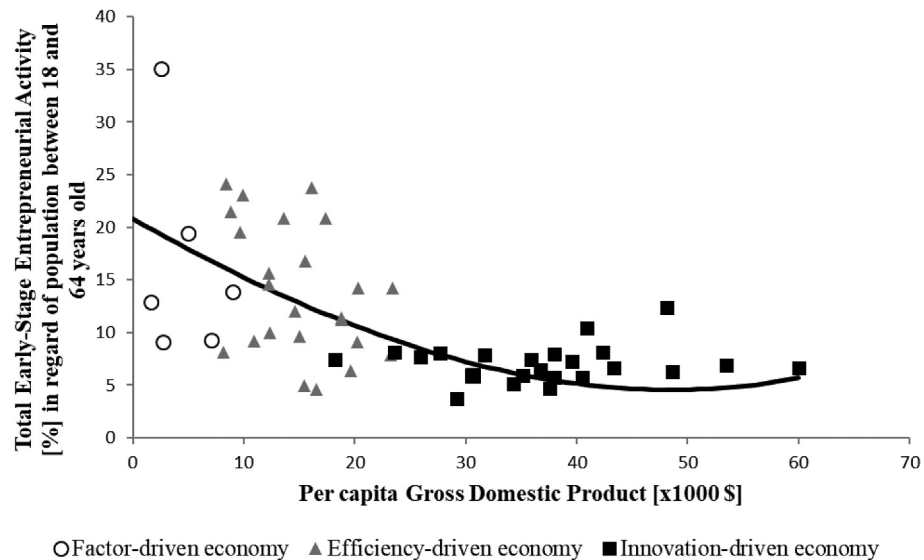
As PPP increases, the opportunity cost of entrepreneurship rises, as the existence of a developed industry provides better employment possibilities. Also, market niches for new ventures decrease due to the capabilities of existing companies that already cope the markets (Crecente-Romero et al., 2016, 2019; Novejarque Civera et al., 2020). Nevertheless, there is a cluster of countries with a dynamic, innovative culture that enjoy both high PPP and a high rate of new venture creation (see Figure 1).

In accordance with the previous arguments, we propose our first hypothesis:

Hypothesis 1: Individuals with high EI will arise from contexts with lower PPP than those with lower EI.

In terms of economic development, Pinillos and Reyes (2011) found that development level is an important variable when analyzing the entrepreneurial aspirations of a society. Economic development is a complex measure, which is why it can be deficient to measure it by looking exclusively to a macroindicator such as PPP. In fact, some countries may enjoy a good economic situation on average for their population, while the uneven wealth distribution can make the daily reality for bigger shares of the population quite different from what could be inferred from the averaged measures. As Acemoglu and Robinson (2012) highlighted, only democratic and egalitarian societies can give rise to economic prosperity. Inequalities can be measured using the Gini index, for which lower measures mean higher equality in a society. There are confronting views on whether inequalities hinder (Acemoglu & Robinson, 2012) or foster (Cingano, 2014; Katz, 1986) economic growth. New research based on Pinillos and Reyes’ proposal points towards inequality as a contextual factor affecting EI for developed countries (Morales-Alonso et al., 2020). Thus, we hypothesize:

Figure 1. Total early stage entrepreneurial activity (TEA) versus per capita GDP (PPP), based on (Wennekers et al., 2005).



Hypothesis 2: Individuals with high EI will arise from contexts with lower inequality (higher values of the Gini index) than those with lower EI.

Economic freedom is measured by the Heritage Foundation through its Economic Freedom Index, which is defined as the degree to which a market economy takes place, based on voluntary exchange, free competition, and protection of persons and property rights. Economic freedom precedes economic growth and is linked with entrepreneurial action (McMullen et al., 2008). Boudreaux et al. (2019) stated that individuals who enjoy high levels of economic freedom and are prone to entrepreneurial venturing are more likely to pursue the foundation of a company than individuals with a similar level of entrepreneurial intention who are located in countries with a lower level of economic freedom. In line with these arguments, we posit that the Economic Freedom Index (referred to as EcFree in the text) fosters entrepreneurship, and therefore:

Hypothesis 3: Individuals with high EI will arise from contexts with higher Economic Freedom Index than those with lower EI.

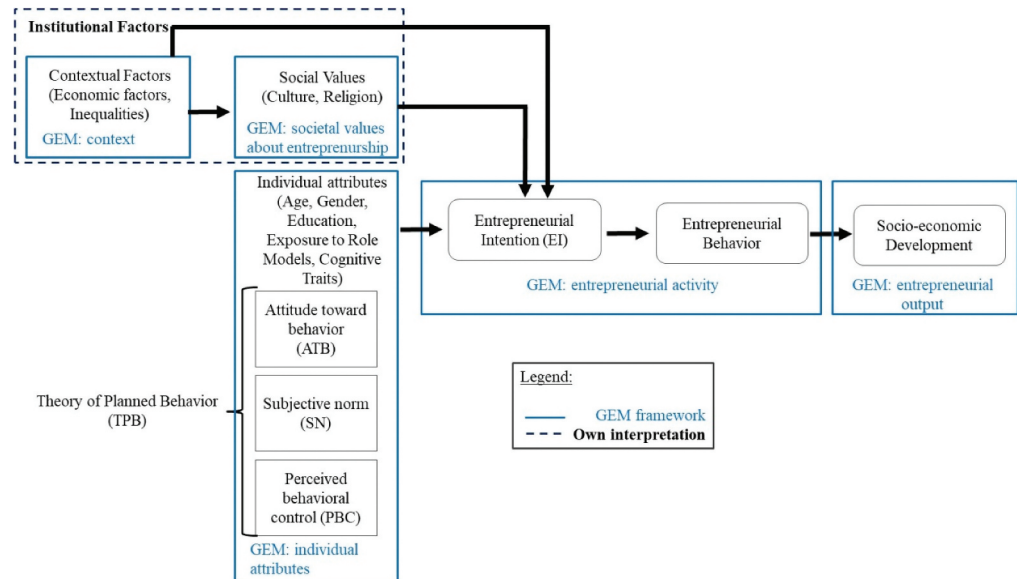
2.2. Social factors that hinder or foster entrepreneurship

The second group of values that, according to GEM, affects entrepreneurial aspirations is social values towards entrepreneurship (see Figure 2). Humans are a social species; that is, the relationships we have with other people are a central part of our behavior (Weber, 1930). These exchanges contribute to the creation of a “culture”, which is a set of beliefs, norms, habits, values, assumptions, symbols, and rituals that have a strong influence on individual attitudes, intentions, and behaviors (Hofstede, 1980; Schwartz & Bilsky, 1987). Entrepreneurial intention is no exception and was found to be the most commonly studied factor among researchers focusing on this topic (Cardella et al., 2020).

When studying different behaviors in intercultural settings, one of the most cited dimensions of culture is cultural values, which may be defined as “concepts or beliefs about desirable end states or behaviors, that transcend specific situations, guide selection or evaluation of behavior and events, and are ordered by relative importance” (Schwartz & Bilsky, 1987).

Individualism (IDV) or autonomy refers to the tendencies to orient values and actions towards independence and the achievement of personal or in-group interests (Hofstede, 1980; Schwartz, 1999; Tiessen, 1997). Collectivism, or conservatism, is characterized as the inclination to

Figure 2. Theoretical framework of entrepreneurial intention and its antecedents. Developed by the authors based on (GEM Consortium, 2021; Hayton et al., 2002; Lee & Peterson, 2000; Morales-Alonso et al., 2022).



act cooperatively in the group's interest, taking closer consideration of the expectations of the immediate group (Hofstede, 1980; House et al., 2004; Kagitcibasi & Berry, 1989; Schwartz, 1999; Triandis, 1994). It is not surprising that entrepreneurial intention has been linked to individualistic values (Busenitz & Lau, 1997; Lee & Peterson, 2000; McGrath et al., 1992; Morales-Alonso et al., 2020; Pinillos & Reyes, 2011), as the autonomy these people depict makes them more likely to involve themselves in less predictable situations that collectivist individuals tend to perceive as being extremely risky (Morris et al., 1994). This leads to the following hypothesis:

Hypothesis 4: Individuals with high EI will rank higher in IDV than those with lower EI.

Another value that is frequently linked to entrepreneurial behavior is Masculinity-Femininity (MAS) (in terms of Hofstede (1980) or mastery—harmony as in Schwartz (1999)). Masculine individuals are characterized as competitive, ambitious, or achievement-seeking, whereas feminine people care more about interpersonal relationships and a general feeling of harmony or necessity to fit into the world (Hofstede, 1980; Schwartz, 1999; Steensma et al., 2000). Therefore, Masculinity values have been linked to entrepreneurship expecting for entrepreneurial intention to be higher in societies more focused on masculine values (Busenitz & Lau, 1997; Jaén et al., 2013; Lee & Peterson, 2000; McGrath et al., 1992). Even more, recent research point out that female entrepreneurship is more oriented towards social entrepreneurship and the economy of communion than male entrepreneurship (Ruiz-Palomino et al., 2019). This suggests that women are driven to new venture creation more due to the fulfillment of a social mission than by the obtaining of wealth. For these reasons, individuals who rank high in Masculinity are considered more daring because of their ambition and have a stronger desire to control their environment, so their attitude and perceived control would be influenced. In this sense, our fifth hypothesis is:

Hypothesis 5: Individuals with high EI will rank higher in MAS than those with lower EI.

The third value that is frequently linked with entrepreneurial behavior is Uncertainty Avoidance (UAI). This cultural value stems from the risk aversion present in a society. That is, it measures the extent to which members of a society tolerate ambiguity and are confident when making decisions in an uncertain setting. High UAI values reflect societies where individuals try to avoid discomfort due to making decisions in risky environments. Not surprisingly, low UAI values have been linked to higher entrepreneurial aspirations (Busenitz & Lau, 1997; Lee & Peterson, 2000; McGrath et al., 1992), although confronting results also exist (Engle et al., 2011). We posit:

Hypothesis 6: Individuals with high EI will rank lower in UAI than those with lower EI.

Despite the frequency of national culture being used to explain social values, controversy has arisen in recent years supporting the belief that national culture can be an evolving, dynamic measure that is strongly impacted by the rise of globalization (Taras et al., 2012). In this sense, researchers such as Pinillos and Reyes (2011) or Morales-Alonso et al. (2020) have shown evidence that culture has a smaller effect on entrepreneurial aspirations of developed countries than it does for developing countries, which could be explained by cultural values losing importance in developed countries. Therefore, there could be another factor underlying the differences between developed countries, other than national culture.

Recently, Smith et al. (2021) claimed that the “theological turn” present in many academic disciplines should also be accounted for in entrepreneurship research. Parboteeah et al. (2015) highlighted that the importance of religion has been ignored in entrepreneurship research, although Audretsch et al. (2013) argued for its importance. Iannaccone (1998) defined religion as a shared set of beliefs, activities, and institutions based in faith in supernatural forces, which is surprisingly similar to the definition of the national culture of Hofstede. We can go back as early as Weber (1930) to find reference of individual behavior guided by religious context, while Parboteeah et al. (2015) argued that religiosity goes “above and beyond” national culture due to religion pointing out the acceptable and unacceptable behaviors.

Religion creates behavioral norms that affect believers and non-believers through the values that are prompted by religion (Adamczyk & Palmer, 2008). Religion and entrepreneurship constitute a link that has been sought after in recent years, scattered through different academic fields. We believe religion complements the national definition of culture, as suggested in (Farmaki et al., 2020). More than 80% of the world’s population claim to follow some form of religion, with the four most common being Christianity (32%), Islam (23%), Hinduism (16%), and Buddhism (7%) (Pew Research Forum, 2010).

Paiva et al. (2020) proved that the influence of religion over the TPB model does not affect ATB, PBC, or SN, but rather acts directly over EI. We posit that, for developed countries, religion can be a factor that influences social norms, both for believers and non-believers, despite the decay of national culture, as suggested in (Adamczyk & Palmer, 2008; Dana, 2009; Parboteeah et al., 2015). Nunziata and Rocco (2016) found support for Protestantism fostering entrepreneurship among religious minorities. Although no effects were found when comparing religious majorities, we consider that a higher social exposure to Protestantist values implies higher values of EI. In opposition, the rate of Catholicism (named in the following as CAT) would hinder EI. This leads us to our next hypothesis:

Hypothesis 7: Individuals with high EI will rank lower in exposure to Catholic values than those with lower EI.

2.3. Individual attributes for entrepreneurship—the theory of planned behavior

Several individual attributes have been sought after in terms of their predicting power for entrepreneurship. We will group them into (i) demographic variables and (ii) human factor variables. The former category could include the variables of age, gender, and exposure to role models (Dileo & García Pereiro, 2019; GEM Consortium, 2021; Krueger, 2000; Morales - Alonso et al., 2015; Morales-Alonso et al., 2016; Pablo-Lerchundi et al., 2015). Among the latter, education and professional experience are known to impact the founding of new ventures (Clarysse et al., 2011; Colombo & Grilli, 2010).

However, individual attributes are poor predictors of entrepreneurship at an individual level (Krueger, 2000). That is, if men are, statistically, more prone to entrepreneurship, this does not mean that a particular masculine individual will be an entrepreneur; therefore, gender has a low

explanatory power for entrepreneurship. This is attributed to the fact that entrepreneurial behavior is volitional and driven by cognitive mechanisms (Entrialgo et al., 2000; Sandberg et al., 2013); that is, the psychological traits present in the individual. Gregoire et al. (2011) encouraged further research dealing with the interrelation between contextual factors and cognitive variables.

The Theory of Planned Behavior (TPB) (Ajzen, 1991) is the main cognitive model for analyzing intentions, and has already been used in coordination with the GEM framework (Morales-Alonso et al., 2022). The extent to which intentions lead to actual behaviors is a topic of open debate. However, the longitudinal studies conducted by Kautonen et al (2013, 2015) prove the strong predictive power of the TPB model. In his theory, Ajzen proposed that the intention is determined by three socio-cognitive factors—Attitude Towards the Behavior (ATB), Subjective Norms concerning action (SN), and Perceived Behavioral Control to perform the behavior successfully (PBC); in this case, the foundation of a new company.

ATB accounts for a behavioral belief of the most probable consequences of the behavior, the creation of a new venture, in the case of entrepreneurship. If the individual perceives the founding of a company as desirable, he or she would rank high on the ATB factor. Therefore, according to the TPB model, we can hypothesize:

Hypothesis 8: Individuals with high EI will rank higher in ATB than those with lower EI.

However, the TPB model also suggests that ATB is not the only belief affecting intention. Humans are social creatures, and we pay attention to the expectations of other individuals with whom we relate. This is accounted for by the TPB model with the second socio-cognitive factor: SN. SN expresses the normative belief, the motivation to comply, acting in accordance to what feels as socially acceptable. Not in vain, entrepreneurial social networks can facilitate the process of bridging the entrepreneurial intention-behavior gap, as found by Ruiz-Palomino and Martínez-Cañas (2021). Hence, the next hypothesis can then be stated as follows:

Hypothesis 9: Individuals with high EI will rank higher in SN than those with lower EI.

Lastly, the perception of how feasible the behavior is, in terms of the means and goals available, is accounted for by the PBC factor within the TPB. The PBC is strongly linked with the locus of control; that is, those non-volitional elements that appear, at least potentially, in all behaviors, such as its difficulty or ease of success. The locus of control has been found to impact entrepreneurial action (Bernardus et al., 2020) and, for this reason, it is foreseeable that individuals with high EI will have it due to ranking higher in PBC; thus:

Hypothesis 10: Individuals with high EI will rank higher in PBC than those with lower EI.

3. Methodology

3.1. Guiding strategy

The focal point of this study is on the interrelation between cognitive traits and institutional factors (both contextual and social) as antecedents of EI for individuals of developed countries with different national cultures. To this end, we rely on the common approach of handling a questionnaire focused on EI to a sample of university master's students (as in Al-Jubari et al., 2019; Amofah et al., 2020; Bazkiaei et al., 2020; Gieure et al., 2020; González-López et al., 2020; López-Delgado et al., 2019; Rivero & Ubierna, 2021; Shiri et al., 2017; Velástegui et al., 2021). A set of 10 variables from three dimensions—namely (i) cognitive traits (ATB, SN, PBC), (ii) contextual factors (PPP, Gini index, EcFree) and (iii) social values (IDV, MAS, UAI, CAT)—has been sought after. In this research, the 10 dependent variables under study arise from a mix of primary and secondary sources. Three of them (the cognitive traits) have been retrieved with a self-administered

questionnaire, as detailed in Section 3.2. The remaining seven variables (contextual factors and social values) have been gathered from secondary sources, as detailed in Section 3.3.

3.2. Our primary source: the questionnaire

A self-administered questionnaire was designed for this study. We received 1901 responses from students of engineering master studies across developed European countries (Germany, Italy, Spain, and Sweden) during the spring semester of 2014 (see Table 1 for participant composition).

The survey included two main blocks. The first was related to respondents' demographic characteristics, such as the country of birth, gender, age, and parent's activities. The second block measured the dependent variable in this study, which is Entrepreneurial Intention (EI), and three out of 10 of the independent variables. This set of four variables are the intention to start a new venture (EI), and the cognitive traits that act as its immediate antecedents, according to Ajzen's modified TPB model (Ajzen, 1991). The distribution of variables and items were as follows:

- Entrepreneurial Intention (EI), addressed by six questions in the survey.
- Attitude Towards the Behavior (ATB), measured with two items.
- Perceived Behavioral Control (PBC), addressed by means of two items.
- Subjective Norm (SN), dealt with by means of four items.

All of these variables were measured on a Likert scale ranging from 1 to 7. The specific items used to measure each variable are summarized in the Annex. Control variables, with the aim of regulating the over/underestimation of questions because of omitted answers were also included. These control variables are expected to correlate with those from the blocks looking at specific behaviors or attitudes.

3.3. Secondary sources

Data of the contextual factors and social values were obtained from secondary sources. They refer to the year 2014 in order to ensure homogeneity with the data from our survey.

The first two contextual factors are the Purchasing Power Parity (PPP), which is the per capita GDP, and the Gini index, that accounts for inequalities within a society. Both factors have been obtained, at the country level, from World Bank data. The third and final contextual factor is Economic Freedom, which we measure through the index of the same name calculated by the Heritage Foundation.

The social values under analysis in this study are (i) Hofstede's Cultural Dimensions (for which we focus solely on Individualism, Masculinity-Femininity and Uncertainty Avoidance),

Table 1. Composition of participants in the survey

Country	University	Men	Women	Total	%
Germany	Technische Universität Berlin	200	49	249	13.0
Italy	Politecnico di Bari	102	87	189	39.4
Italy	Politecnico di Milano	219	84	303	
Italy	Università di Parma	191	66	257	
Spain	Universidad Politécnica de Madrid	345	210	555	29.1
Sweden	Kungliga Tekniska Högskolan	134	67	201	18.3
Sweden	Linköpings Universitet	103	44	147	
Total		1294	607	1901	100

Table 2. Panel data in use

Measure	Germany	Italy	Spain	Sweden
EcFree ^a	73.4	60.9	67.2	73.1
PPP ^b [\$/pax]	47012	36195	33526	47046
Gini ^c	31.7	34.7	36.1	28.4
IDV ^d	51	76	67	71
MAS ^d	42	70	66	5
UAI ^d	86	75	65	29
CAT ^e	29%	94%	92%	5%

^aEconomic Freedom Index, provided by the Heritage Foundation, as of 2014.

^bPurchasing Power at Parity, obtained from the World Bank data as GDP and population as of 2014.

^cGini Coefficient, obtained from the World Bank data as of 2014.

^dIndividualism, Masculinity and Uncertainty Avoidance data obtained from Hofstede's cultural dimensions.

^eCatholicism, obtained as an average percentage from the World Value Survey and the CIA Factbook.

and (ii) the dominant religion in a given society. The measures of the Cultural Dimensions were obtained from Hofstede's website, while the percentages of Catholicism and Protestantism are averaged at the country level from the measures given by the World Value Survey and the CIA Factbook.

The variables' values for contextual and social factor of each country are summarized in Table 2.

3.4. Manova

Multivariate ANOVA (MANOVA) extends the capabilities of analysis of variance (ANOVA) by assessing multiple dependent variables simultaneously. ANOVA can only assess one dependent variable at a time, but the interest was in analyzing the behavior of 10 dependent variables when two different partitions in the EI were considered. Partition I is a decile division of the sample that accounts for the respondents belonging to the 10% highest and 10% lowest in the EI scale, whereas Partition II is a quartile division (25% highest and 25% lowest in EI scale); see Figure 3 and Table 3. This strategy has proved its validity (see Morales - Alonso et al., 2015) and is used to understand the relevance and consistency of the potential relationship between the independent and the dependent variables.

Figure 3. Graphic representation of the sample partitions for MANOVA analysis.

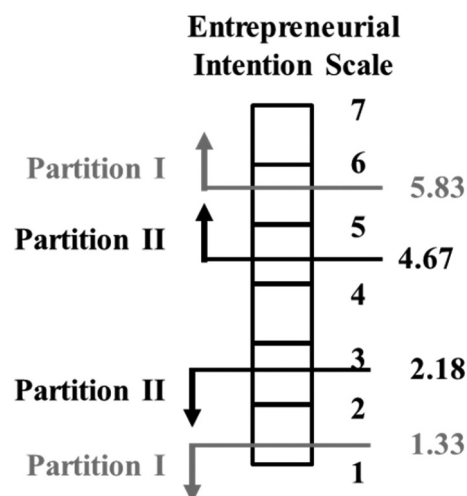


Table 3. Partitions of the sample

PARTITION I (DECILE)			PARTITION II (QUARTILE)		
%	EI	#	%	EI	#
10% Higher	5.83	178	25% Higher	4.67	488
10% Lower	1.83	204	25% Lower	2.18	465

3.5. Regressions

Our research allowed us to estimate some of the potentially significant variables that explain EI. However, some other contextual variables could bring additional insights that make it possible to customize EI models according to such contextual variables. Therefore, contextual variables have been studied with the aim of determining the most suitable number of clusters. This is a major challenge in cluster analysis because it is unknown and must be estimated prior to clustering the observed data. Consequently, estimating the number of clusters becomes challenging. A robust cluster enumeration criterion was adopted, by formulating the problem of estimating the number of clusters as maximization of the posterior probability of multivariate distributed candidate models. The robust criteria require an estimate of cluster parameters for each candidate model as an input. Hence, we used a two-step cluster enumeration algorithm that uses the expectation maximization algorithm to partition the data and estimate cluster parameters prior to the calculation of one of the robust criteria.

We found that the six clusters were quite well described by the economic, social, and cultural context of the considered countries, where some clusters fit well with the country variable. After enumerating samples, linear regression models as per cluster were developed in order to understand the relevance for ATB, PBC, and SN as capable of explaining EI inside each cluster, including the goodness of the regression as well as significance for the individual coefficients.

4. Results

4.1. Descriptive statistics

The statistics for age, gender, and nationalities distributions have already been presented in Table 1. Figure 4 presents structural relationships between the 11 variables of the study.

4.2. Findings

In this research, we are looking into 10 dependent variables (three contextual factors, four social values, and three cognitive traits) and their relation with our independent variable (entrepreneurial intention, EI). As a first measure of the interlink between these variables, a pairs correlation matrix has been created; see Figure 4. As the figure shows, the three variables that have non-cluster behavior and are potentially useful to predict EI are the cognitive factors from the TPB model (ATB, SN and PBC). The remaining seven dependent variables do not correlate well with ATB, SN, or PBC for the whole sample, so we can assume that they do not act as antecedents of the TPB model.

We have then looked into the sample respondents that rank high in the independent variable (EI) to see their differences from those who rank low. To that end, two partitions have been created in the sample, as described in Section 3.4. With these partitions, the MANOVA has been performed. The obtained results are depicted in Tables 4 and 5.

The analysis of Tables 4 and 5 allows us to conclude by accepting or rejecting the proposed hypotheses. For the sake of clarity, Table 6 refreshes the hypotheses definition and their acceptance or rejection. We begin by looking at the results obtained for contextual factors. In terms of economic development (measured as PPP), we find statistical significance, for both partitions, that EI is higher when respondents come from countries where PPP is lower. This allows us to accept H1.

Figure 4. Relationships between pairs of variables and individual frequencies.

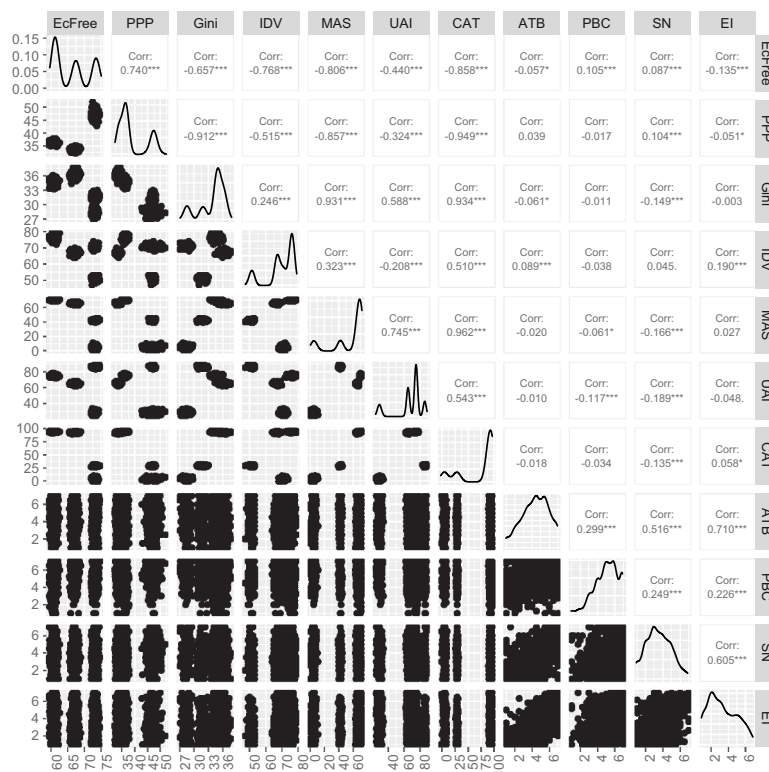


Table 4. Results for MANOVA analysis for Partition I (decile)

%	PPP ^a	Gini ^b	EcF ^b	IDV ^b	MAS ^b	UAI ^b	CAT ^b	ATB ^c	SN ^c	PBC ^c
10 H	38.4**	33.6·	65.2***	71.7***	55.0*	64.8	72.4**	6.17***	5.24***	5.68***
10 L	40.5**	33.0·	68.3***	65.8***	48.5*	66.2	58.4**	2.49***	2.39***	4.79***

^aPPP expressed in [k\$/pax]

^bFactors rank from 0 to 100

^cTPB factors rank from 1 to 7

Signif. *p* Values: ***, *p* ~ 0; **, *p* ~ 0.001; *, *p* ~ 0.05; ·, *p* ~ 0.1

Table 5. Results for MANOVA analysis for Partition II (quartile)

%	PPP ^a	Gini ^b	EcF ^b	IDV ^b	MAS ^b	UAI ^b	CAT ^b	ATB ^c	SN ^c	PBC ^c
25H	38.15*	33.7·	64.9***	71.8***	56.7·	66.3·	74.6*	5.84***	4.82***	5.56***
25L	39.0*	33.6·	66.9***	67.5***	55.0·	68.5·	69.1*	3.09***	2.7***	4.83***

^aPPP expressed in [k\$/pax]

^bFactors rank from 0 to 100

^cTPB factors rank from 1 to 7

Signif. *p* Values: ***, *p* ~ 0; **, *p* ~ 0.001; *, *p* ~ 0.05; ·, *p* ~ 0.1

Although there is less statistical support for inequalities differences between the two groups, the results nevertheless point out that lower inequalities (higher Gini index) allow for higher entrepreneurial aspirations. For this reason, we conclude that H2 is also confirmed.

On the contrary, we find statistical support against H3 for both partitions: higher Economic Freedom indexes do not call for higher EI, according to our results.

Table 6. Summary of hypotheses analyzed, with their acceptance or rejection

Hypotheses	Accepted/Rejected
H1: Individuals with high EI will arise from contexts with lower PPP than those with lower EI.	Accepted
H 2: Individuals with high EI will arise from contexts with lower inequality (higher values of the Gini index) than those with lower EI.	Accepted
H3: Individuals with high EI will arise from contexts with higher Economic Freedom Index than those with lower EI.	Rejected
H4: Individuals with high EI will rank higher in IDV than those with lower EI.	Rejected
H5: Individuals with high EI will rank higher in MAS than those with lower EI.	Accepted
H6: Individuals with high EI will rank lower in UAI than those with lower EI.	Partially accepted
H7: Individuals with high EI will rank lower in exposure to Catholic values than those with lower EI.	Rejected
H8: Individuals with high EI will rank higher in ATB than those with lower EI.	Accepted
H9: Individuals with high EI will rank higher in SN than those with lower EI.	Accepted
H10: Individuals with high EI will rank higher in PBC than those with lower EI.	Accepted

Table 7. Regressions results

Country	ATB	SN	PBC
Germany	0.48***	0.32***	0.01
Italy	0.50***	0.42***	0.03
Spain	0.61***	0.36***	0.03
Sweden	0.74***	0.29***	-0.25***

In terms of cultural values, the results are mixed. First, we find significantly lower IDV values in the group with higher EI, for both partitions, so H4 is not confirmed. Second, we can confirm H5 for both partitions, but with less statistical significance. Third, we do not find statistical support for H6 in Partition I, but we do for Partition II, so this is partially supported. The last dependent variable of this group deals with religiosity, measured as the exposure to Catholic values. Our results suggest that Catholicism can foster entrepreneurship; for this reason, H7 is rejected.

We then looked into cognitive traits. Hypotheses H8, H9 and H10, related to the TPB model, are confirmed for both Partitions I and II. That is, those individuals with higher EI also rank higher in the three factors of the TPB model (ATB, SN, PBC) than those who rank lower in EI, and this result is statistically significant.

Our last analyses are the regressions of the cognitive factors ATB, SN, and PBC over EI for the four countries under study; see Table 7.

The regressions with the three cognitive factors explain 49% of the variability of EI for Germany, 54% for Italy, and 68% for both Spain and Sweden. PBC is a factor that appears to have lower importance within the model, as discussed in the next section.

5. Discussion

Several actors, including academics, practitioners, and public institutions, have devoted their efforts to understanding the antecedents of entrepreneurial activity. Although frameworks including contextual, social, and individual attributes have been proposed by academic researchers (such as Hayton et al., 2002; Krueger, 2000; Lee & Peterson, 2000) and also by practitioners like GEM (GEM Consortium, 2021), none of these frameworks is universally accepted. The present research contributes more data to enrich the discussion of how such a framework could look. Particularly, we posit that not all the variables that affect EI are equally important. Previous results (Kautonen et al., 2013, 2015; Krueger, 2000; Morales-Alonso et al., 2022) suggest that cognitive traits could follow the Pareto rule when anteceding entrepreneurial aspirations, being the 20% of the input driving the 80% of the output. Our results support partially this assertion.

A relatively high share of EI variability (between 49% and 68%, depending on the country) can be explained by cognitive traits alone. When each country is looked after on its own, we can see that SN have higher importance in Italy and Spain than in Germany and Sweden, denoting that social support for entrepreneurship are given different importance in the Mediterranean than in North-European countries. We also find that, in general, less importance is given to PBC than to ATB and SN. This is in line with the findings of Morales - Alonso et al. (2015), for which the existence of barriers for entrepreneurship do not discourage those with high EI, and those of Gieure et al. (2020), who found that SN are critical for entrepreneurial behavior.

As cognitive traits do not explain 100% of EI variability, we conclude that there must be some other factors that explain this variable. Although we have not been able to identify them, we can determine that, according to our results, they do not seem to be national culture, religiosity, economic development as measured by PPP, inequalities as measured by the Gini index, nor Economic Freedom as measured by the Heritage Foundation.

Nevertheless, our results reveal some relevant factors. We prove, first, that, for developed countries, lower economic development (lower PPP) can foster entrepreneurship; this is in line with previous results such as (Crecente-Romero et al., 2016, 2019; McMullen et al., 2008; Novejarque Civera et al., 2020; Wennekers et al., 2005). That is, individuals seen more prone to entrepreneurship in locations where they are “pushed” by necessity, contrarily to what has been recently reported by Martínez-Cañas et al. (2023), where push motivators were not found as more relevant than pull motivators. The results between PPP and EI in our sample can be explained as follows. In developed countries with high PPP, students of technical universities can find good employment opportunities in the industry. Therefore, the opportunity cost of entrepreneurship is higher for them than it is for countries with lower PPP, where well-paid job opportunities in the industry may be scarcer. Second, in terms of inequality, our results point in the same direction as those of Acemoglu and Robinson (2012): less inequality fosters entrepreneurship in developed countries. Finally, economic freedom as measured by the Heritage Foundation does not seem to make a difference among the countries studied in this research. This may be attributed to the fact that differences in the values of the Economic Freedom index of the four countries under study are relatively small; and also to what McMullen et al. (2008) pointed out: the relation between economic freedom and entrepreneurship is complex and can act differently for necessity and opportunity entrepreneurship.

We have found less support for social values, particularly for cultural values. This aligns with previous results (Morales-Alonso et al., 2020; Taras et al., 2012) pointing to the concept that national culture has less importance in developed countries. This may be explained by the rise of globalization, which tends to smooth out the differences between countries, especially in urban environments in which our sample has been taken. We find that individualism does not foster entrepreneurship. In Morales-Alonso et al. (2020), this relation was also found for underdeveloped countries, in which collectivism proved to support entrepreneurial aspirations. Besides, masculinity can be a driver of entrepreneurship (despite the lower statistical support found for it), while mixed

results have been found for uncertainty avoidance. The fact that MAS is the more relevant cultural dimension when it comes to entrepreneurial intention paves the way for more research focusing on the differences between men and women. This result is aligned with what Ruiz-Palomino et al. (2019) suggest: women prefer to engage in entrepreneurship due to its contribution to well-being, rather than by wealth obtaining.

To finalize, we cannot support the idea that a higher exposure to Catholicism in developed countries hinders entrepreneurship. In both partitions of our sample, we found that the group with higher EI is composed by individuals with a higher exposure to Catholic values. This confronts the belief, attributed to Weber (1930), that Protestantism is more prone to entrepreneurship than Catholicism.

6. Conclusion

As highlighted by Schumpeter (1934), Kirzner (1973) and Drucker (1985), among others, the creation of new businesses has an important influence on economic growth, employment, and innovation. That is, the entrepreneur is the source of all economic change: capitalism can only be properly understood in terms of the conditions giving rise to entrepreneurship. Therefore, it is crucial to disentangle the main drivers of entrepreneurship and the relationships between them.

Contextual, social and individual factors act over entrepreneurial intentions, making it a multi-level phenomenon. In this research, we posit that not all the variables are equally important. We hypothesize that cognitive traits are individual factors that are more important than contextual and social factors. In order to check this hypothesis, we analyzed the results of a questionnaire answered by 1901 individuals from a set of developed countries (Germany, Italy, Spain, and Sweden). We measured entrepreneurial intentions and cognitive traits (taken from the Theory of Planned Behavior) while we gathered contextual information from panel data set. The contextual variables we looked at are Purchasing Power at Parity (which is per capital GDP), the Gini index for inequality, and the Economic Freedom index. As social factors, we have taken national cultural dimensions (as defined by Hofstede) and the exposure to Catholic values. This research provides theoretical implications and lessons for practitioners that are detailed (together with the limitations of the study and recommendations of further research) in the following sections.

6.1. Theoretical implications

This research is relevant for the academic community as it proves the existence of a hierarchy in the antecedents of entrepreneurial intention. When we look at cognitive traits for entrepreneurial intentions through the lens of the Theory of Planned Behavior, we find good support for it in our sample. According to our results, cognitive traits are more relevant for entrepreneurial intentions than contextual or social factors.

At the same time, we find that cognitive traits on their own are not able to predict entrepreneurial intentions. For this reason, we conclude that determinants of entrepreneurial aspirations are complex and multifaceted, and that there can be other factors that act as detonators for new ventures creation. These complex relations call for caution; when governments or public institutions intervene with the aim of fostering entrepreneurship, simple one-size-fits-all measures should be avoided.

We found notable differences between the countries under study in terms of cognitive traits for entrepreneurial intentions. In particular, subjective norms appear to be more important in Italy and Spain than in Germany and Sweden. This would imply that individuals from Mediterranean countries pay more attention to what their social networks support or not. Despite these differences between countries, we conclude that the national culture dimensions of Hofstede may no longer be a good framework to depict young adults' behavior in developed countries.

In line with other researchers, we conclude that lower economic development can foster entrepreneurship in the presence of lower inequalities. This means that when good career opportunities are

available, opportunity costs make entrepreneurship comparatively expensive. At the same time, higher inequalities can discourage entrepreneurship, probably due to the feeling that business prospects are strongly linked with how well or bad the entrepreneur is related to the social elites. In our sample, a higher Economic Freedom index has not provided higher entrepreneurial intentions. We believe this can be attributed to the small differences in the index between the countries we focused on. Lastly, the exposure to Catholicism does not hinder entrepreneurship, according to our results.

6.2. Implications for practitioners

The existence of a hierarchy in the antecedents of entrepreneurial intentions is also a relevant implication for practitioners and private actors involved in fostering entrepreneurship and funding new ventures. Incubators and funding institutions should evaluate cognitive traits of potential entrepreneurs. When possible, they should pay attention to nationalities driven by high Masculinity cultural values, as defined in the national dimensions of Hofstede.

Public institutions willing to promote entrepreneurship should be aware that the lower levels of PPP—require more entrepreneurship. Therefore, the efforts to promote entrepreneurship in countries or regions where PPP is lower might be more successful. Also, as lower inequality levels seem to foster entrepreneurial intentions, countries will be better off in terms of new venture creation if they can reduce inequalities between their inhabitants.

6.3. Limitations and avenues of future research

As a limitation of this research, we note that the countries included belong to those in which the Total Early-Stage Entrepreneurial Activity (TEA) measured by the Global Entrepreneurship Monitor correlates negatively with Purchasing Power at Parity (PPP). Future research endeavors could focus on developed countries where the correlation between TEA and PPP has been noted as positive, such as United States, Norway, or Singapore. Likewise, future studies can consider underdeveloped regions, preferably those with a marked difference between exposure to Catholicism (such as Latin America) and its absence (such as South East Asia). Lastly, we believe that longitudinal studies tracking the same individuals when they are master's students and, say five years later, as young professionals could contribute to increase our knowledge about entrepreneurial intentions.

Abbreviations

ATB	Attitude Towards Behavior;
CAT	Proportion of Catholicism within a country;
EcFree	Economic Freedom Index
EI	Entrepreneurial Intention;
IDV	Individualism-Collectivism national culture factor;
MAS	Masculinity-Femininity national culture factor;
PBC	Perceived Behavioral Control;
PPP	Purchasing Power at Parity
SN	Subjective Norm;
TPB	Theory of Planned Behavior;
UAI	Uncertainty Avoidance Index national culture factor

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Disclosure statement

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Ethics declaration

This study has been performed in accordance with the Declaration of Helsinki. The study relies on a survey, which is a non-interventional study, and for this reason does not require specific ethical approval.

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ANNEX – QUESTIONNAIRE

SURVEY ON ENTREPRENEURSHIP

This survey is part of a research regarding the entrepreneurial intention of young people. Your opinion on different aspects is of the greatest interest for us. Please answer truthfully the following questions. This is an anonymous survey. Thank you for your cooperation!

1.- Please, write or mark with an X the correct answer.

Age: _____		Gender: ☐ Male ☐ Female		Degree: _____		Year: _____	
Country of birth own: _____		father: _____		mother: _____			
Economic social class: ☐ Low ☐ Medium-Low ☐ Medium-High ☐ High							
Highest educational level of your father:				Highest educational level of your mother:			
☐ No studies				☐ No studies			
☐ High school education				☐ High school education			
☐ Professional/Vocational training				☐ Professional/Vocational training			
☐ University				☐ University			
Father's Occupation:				Mother's Occupation:			
☐ Civil servant				☐ Civil servant			
☐ Employee				☐ Employee			
☐ Entrepreneur/Employer				☐ Entrepreneur/Employer			
☐ Unemployed				☐ Unemployed			
☐ Other: _____				☐ Other: _____			
Does anyone in your environment (family or close friends) have their own business? ☐ Yes ☐ No							

2.- In each of the following statements make a circle around the answer with which you feel more identified. The scale ranges from 1 (total disagreement) to 7 (total agreement).

Being an entrepreneur seems an attractive career future to me (<i>variable: ATB</i>)	1	2	3	4	5	6	7
Among various professional options, I would rather be an entrepreneur (<i>variable: ATB</i>)	1	2	3	4	5	6	7
Starting a firm and managing it would be easy for me (<i>variable: PBC</i>)	1	2	3	4	5	6	7
I am able to control the creation process of a new business (<i>variable: PBC</i>)	1	2	3	4	5	6	7
I am ready to do anything to be an entrepreneur (<i>variable: IE</i>)	1	2	3	4	5	6	7
My professional goal is to become an entrepreneur (<i>variable: IE</i>)	1	2	3	4	5	6	7
I will make every effort to start and run my own firm (<i>variable: IE</i>)	1	2	3	4	5	6	7
I am determined to create a firm in the future (<i>variable: IE</i>)	1	2	3	4	5	6	7
I have very seriously thought of starting a firm (<i>variable: IE</i>)	1	2	3	4	5	6	7
I have the firm intention to start my own business some day (<i>variable: IE</i>)	1	2	3	4	5	6	7
If I decided to create a firm, people in my close environment would approve of that decision:							
Parents and brothers (<i>variable: SN</i>)	1	2	3	4	5	6	7
Friends (<i>variable: SN</i>)	1	2	3	4	5	6	7
Colleagues (<i>variable: SN</i>)	1	2	3	4	5	6	7
Rest of society (<i>variable: SN</i>)	1	2	3	4	5	6	7