Knowledge and Culture on Entrepreneurship

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Abstract: The paper contributes to the interpretation of entrepreneurship based on the effect of knowledge and the cultural background. Entrepreneurship is defined as both the self-employment and the entry density rates, comparing the two models. The present paper uses a series of variables to express these effects, which are analysed with a principal component analysis and a regression analysis. The results confirm that cultural background strongly affects both entrepreneurship rates. Knowledge creation does not affect entrepreneurship rates, as its impact on entrepreneurship is long-lasting (it could reach more or less 10 years) and not a short-term one. Simultaneously, knowledge impact affects negatively the self-employment rates and positively the entry density rates in the economies. Furthermore, performing a sensitivity analysis on knowledge and cultural background, the conclusions confirm that cultural background has a strong interpretive role in both entrepreneurship rates. Moreover, under the new prevailing conditions the creation of knowledge and the impact of knowledge have a negative effect on self-employment, while the effect of knowledge impact is strengthened in the cases where we increase knowledge and it is weakened where we decrease the knowledge variables.

1. Introduction

The purpose of this paper is to identify and quantify the effects of knowledge and culture on the entrepreneurship of societies. The concept of entrepreneurship is approached through two different variables: a) the self-employment rates and b) the entry of new firms in the economy, so that we can explore the differences in the results when we use different variables expressing the concept of entrepreneurship.

Romer (1986) and Lucas (1993) formalized the explicit introduction of knowledge into macroeconomic growth models, stating that knowledge is particularly important as a result of externalities and spillovers. They assumed knowledge automatically to spill over from the firm or organization generating that knowledge, for commercialization by third-party firms. This introduction shifted the focus of policy to knowledge, which became particularly potent in terms of its impact on growth when compared to the traditional factors of physical capital and labour, where no such spillovers and free access by third-party firms was possible (Audretsch, 2007).

At the same time, the definition of entrepreneurial opportunities raises the question of the exact impact of culture on entrepreneurship, as indicated by disciplines such as economics (Schumpeter 1934), sociology (Weber 1930) and psychology (McClelland 1961). Moreover, it involves several issues attributed to the social characteristics that constitute what we understand as "culture". Culture and economics can be seen as two of the more powerful forces shaping human behaviour (Throsby, 2001).

The contribution of the present paper to the literature lies, in the first place, in that it investigates the simultaneous effect of knowledge and culture on entrepreneurship. Secondly, this paper considers two different types of entrepreneurship: self-employment and entry density and it makes a comparison between the two. Thirdly, it investigates the issue of endogeneity between self-employment, entry density and the knowledge and cultural background. Finally, the paper contributes through a sensitivity analysis which examines the change in the structure of knowledge and the cultural background of societies, as well as the new conditions shaped for the self-employment and the entry density rates.

The order of the paper is as follows: Section 2 presents the theoretical background and more specifically, the concept of knowledge in general, as well as its effects on the economic behaviour, the concept of knowledge in the Institutional/ Post-Keynesian model and the relationship between cultural background and entrepreneurship. Section 3 presents the data used in the empirical analysis. The following session (Section 4), describes the methodology

employed, i.e., the empirical model and measurements, while Section 5 presents the empirical work and the discussion of the results. Finally, Section 6 presents the conclusions.

2. Entrepreneurship Identification, Knowledge and Cultural Background

The identification and the exploitation of entrepreneurial opportunities are an important part of the entrepreneurial process. The theory of Entrepreneurship identification tends to conclude in three basic schools of thought for the identification of investment opportunities: the economic, the cultural and the sociopolitical Schools (Companys and McMullen, 2007).

The Economic School defines an entrepreneurial opportunity as an objective phenomenon that exists in time and space, which may be unknown to some people (Shane and Venkataraman, 2000, Shane, 2003). The reasons why some people recognize entrepreneurial opportunities while others do not, has been the subject of many theoretical and empirical studies (Begley of Boyd, 1987; Brockhaus, 1980; Cooper and Dunkelberg, 1987; Sexton and Bowman, 1984; Busenitz and Barney, 1997; Kaish and Gilad, 1991; Krueger, 2000, 2007; Gaglio and Katz, 2001; Mitchell et al., 2002, 2007; Baron, 2004, 2006; Baron and Ward, 2004, Gaglio, 2004; Ward, 2004). Better access to information and knowledge, improves the ability of a person to identify entrepreneurial opportunities (Aldrich, 1999; Shane, 2000, 2003; Anderson and Miller, 2003; Shane and Venkataraman, 2000). Kirzner (1973) argues that opportunities exist; but someone has to identify them. This view is accepted by all approaches that use research, knowledge and innovation as basic elements in the procedure of identification of entrepreneurial opportunities (Nelson and Winter, 1982; Denrell et al., 2003). According to Mitchell (2001) entrepreneurial cognition is the knowledge structures that people use in order to make assessments, judgments or to make decisions involving opportunity evaluation, venture creation and growth. The Economic School attributes entrepreneurial opportunities to the distribution of information regarding the material opportunities that exist in the society (Arrow, 1962; David and Foray, 2003). Davidson and Honing (2003) argue that the access to resources increases the ability of a person to discover and exploit entrepreneurial opportunities. According to the resource based theory of entrepreneurship, entrepreneurs have personal resources, which facilitate the search for new opportunities and the use of new resources from an emerging firm (Alvarez and Busenitz, 2001).

The School of Culture or alternatively the School of the way of understanding supports that entrepreneurial opportunities are subjective and not objective constructions-phenomena (Sarasvathy, et al., 2003). According to Weick (1979), there are entrepreneurial opportunities to the extent that individuals comprehend their existence. Entrepreneurial opportunities do not exist in an objective way waiting for someone to discover them. The protagonists – the individuals- construct them by putting together patterns and cognitive organizational skills to develop them. So, the existence of a specific cultural background forms the basis of a sustainable competitive advantage (Rindova, et al., 2003). As far as entrepreneurs are concerned, they define business opportunities through social interactions.

Entrepreneurial opportunities are subjective constructions depending on two factors: On the doubt and insecurity that are embedded in the daily function of the environment and on the rational and cognitive ability of people to define and interpret opportunities of this kind. Therefore, entrepreneurial opportunities exist from the moment they are defined.

In the background of the theoretical considerations of the Cultural School underlies the belief that the differences in the distribution of knowledge are the primary source of business opportunities, and for this reason, this school presents similarities with the Economic School. However, it argues that the differences in the cognitive level, that influence the capability to perceive entrepreneurial opportunities, are due to cultural reasons and not to the amount of factual information or past experiences (Eisenhardt and Schoonhoven, 1990; Shane, 2000). Additionally, entrepreneurial opportunities can be actively created by the entrepreneur himself (Sarasvathy, et al., 2003; Buchanan and Vanberg, 1991).

Finally, the Sociopolitical School is a commonplace between the other two, as it supports the important role administrative mechanisms play in the definition of entrepreneurial opportunities (Granovetter, 1985). In agreement with the economic School it stresses out the objective properties of entrepreneurial opportunities. Furthermore, this school emphasizes on the political procedures that are being exercised so as to bear to seize entrepreneurial opportunities (Fligstein, 1996, 2002). It considers that entrepreneurial opportunities exist and evolve into complex networks of social relations, which are shaping the economic activity. In this sense, it puts more emphasis on networks rather than resources (Aldrich and Fiol, 1994; Thornton, 1999). In these networks social actors must mobilise resources for the exploitation of objective opportunities. Within the socioeconomic networks the structural opportunities which are available to the actors are indicated. Therefore, the position someone occupies in the networks plays a crucial role in whether they will have the possibility to discover opportunities or not. The placement of actors in a concrete network

determines the mass of critical resources and information that the actor may dispose in order to exploit the opportunities (Burt, 1992).

The mechanisms of management are very important when discovering and making use of entrepreneurial opportunities, mainly because they affect the relations between actors within a particular network. It is, in fact, the rules of the game that affect both the behaviour of individuals (DiMaggio and Powell, 1983) and the conditions imposed by the external environment (Campbell, et al., 1991).

However, regardless of the methodology with which the issue of the recognition of entrepreneurial opportunities is approached, two key factors seem to play a role first in the identification of entrepreneurial opportunities and then in their activation as entrepreneurship events: Knowledge and the Cultural Background of societies.

2.1 Knowledge and Entrepreneurship

New conditions that have arisen from the constantly changing environment, globalisation, the changing economic and political structures, new technologies, specialised customer requirements, and an emphasis on quality products and services have led economies to appreciate the critical role of knowledge in the increasingly competitive global market. Knowledge is now considered to be a valuable commodity, and concepts such as knowledge sharing and lifelong learning have become increasingly prevalent in business practices. De Witte and van den Brink (2011) suggest that even without major increases in (public) funding, improvements in educational outcomes and thus knowledge improve economic performance.

Davenport and Prusak (1998) define knowledge as "*a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, process, practices, and norms*". They suggest that knowledge is derived from information, which in turn, is derived from data.

Knowledge includes no-coded ideas of uncertain and asymmetric economic value. It is acquired mainly by conducting transactions, communicating with other people and obtaining information through reading and observation. These transactions usually take place within a group or community and use its tools, ideas, techniques and unwritten laws (Rasheed, 2005). Learning through collectivity and organisation in groups is a social process of knowledge accumulation, but it is also an indispensable tool for the transfer of knowledge over time.

Martins (2011) states that knowledge is more than information, since it involves understanding obtained through learning and experience.

According to Karlsson, et al. (2004), knowledge can be defined as scientific knowledge, technological knowledge and entrepreneurial knowledge. The first two definitions of knowledge are more associated with incumbents, such as firms or universities. Entrepreneurial knowledge, comprises specific knowledge tied to the market and the functioning of an economy and is connected to what is required in order to introduce an innovation (Schumpeter, 1911). Moreover, the ability to recognize and capitalize entrepreneurial opportunities can be considered as part of the cognitive background of a person.

The expected economic value of knowledge or of a new idea varies significantly among economic actors. The different level of education and the differences in the background and the experience of economic actors create different conditions associated with knowledge, the high degree of uncertainty, information asymmetries and the cost of transactions, and they lead to different decisions (Audrestch, 2007). In line with the Cultural School, the above differences may lead to discrepancies regarding the identification, the evaluation and the decision making of realizing entrepreneurial opportunities among economic actors, due to the different perception about the expected value of a new project.

Between knowledge with a potential commercial value and knowledge that is actually commercialized there is a knowledge filter (Acs, et al., 2004; Audretsch, et al., 2006). Thus, the knowledge filter activates the knowledge and it transforms it into business activity. In a sense the present paper detects the role and the operation of the knowledge filters.

About the concept of the management of knowledge, it is the subject of systematic research to discover the roots of business development (Nonaka, 1994; Von Krogh et al., 2000; Smith et al., 2005; Randeree, 2006; Dalmaris et al., 2007). The interaction of knowledge with innovation has an impact on business competitiveness. If businesses use knowledge properly, they gain a competitive advantage in becoming more sustainable, competitive and innovative. At the operational level, knowledge flows in from the external environment through formal and informal channels (Smith and Temple, 2007). Businesses have an integrated wealth of knowledge, which is established through their working practices, management systems and human resources.

Organisational knowledge is not easily imitated by a firm's competition, which results in a sustainable competitive advantage and a strategic asset for businesses (Bollinger and Smith, 2001). The challenge for businesses is to be able to capture that knowledge and to

leverage it through their operations. The investments in new knowledge by the firms and the organizations not only do they create an opportunity for a comparative advantage to the firms themselves, but they also form the conditions for knowledge to spill over, for other third-party firms as well (Griliches, 1992).

2.2 Cultural Background and Entrepreneurship

Culture is defined as "a set of shared values, beliefs, and expected behaviours" (Hayton, et al., 2002). The cultural characteristics of societies reflect psychological social stereotypes created over time, which are prior human constructs to the current conditions of transactions and institutions. The cultural background can be considered an endogenous product of human civilisation (Hong, 2009; Oyserman and Sorensen, 2009) consisting of cultural syndromes that can be considered as intermediate mental constructions that originate from the distant past, connecting it with the present (Hong 2009). This view is in line with cultural evolutionary theory, which stresses that individuals tend to adopt certain pre-existing cultural values (Bergh and Stagl, 2003).

McClelland (1961) attempted to relate societal values with entrepreneurial variables and economic dynamism in general. Furthermore, he attempted to quantify the impact of entrepreneurship culture in economic development without using an economic model. Lynn (1991), also without using a model, concluded that countries moving towards competing values are associated with higher levels of economic development. Scientific research also highlights other factors (Triandis, 2009), including cultural complexity, cultural austerity (Triandis, 1994) and value orientation theory (Kluckhohn and Strodtbeck, 1961). The different social and political procedures that shape the cultural background of each society guide human behaviour and the character of all of the stakeholders. Thus, Grief (1994) highlights the fact that different cultural values lead to different societal structures of economic relationships. Furthermore, Bunzel and Kelemen (2011) suggest that while much emphasis has been put upon developing a region's infrastructure, developmental policies and strategies need to reflect the corresponding regional culture.

Many studies have quantified the "effects" of cultural background and provided relevant data for a large number of countries (McClelland, 1961; Hofstede, 1980, 2001; House, et al., 2004; Savig and Schwartz, 2007). Georgas and Berry (1995) and Inglehart (1997) have identified groups of countries that seem to share common cultural values. Cultural and institutional factors may explain cross-national differences in levels of

entrepreneurial activity (Wennekers, et al., 2002; Wennekers, 2005, 2006). Thomas and Meller (2000) found that differences in cultural orientation between countries- affect the personality characteristics commonly associated with motivation for entrepreneurship. Furthermore, studying regional differences of entrepreneurial culture in Sweden using cultural values and belief data, Davidsson and Wiklund (1997) concluded that there is a weak relationship between entrepreneurial values and the formation of new regional firms.

Shane (1993) as well as Grilo and Thurik (2008) argue that other factors beyond the economic ones play a role in shaping entrepreneurship. Shane (1993) found a strong influence of Hofstede's (1980) cultural value of uncertainty avoidance on the levels of innovativeness of societies. Morris et al. (1994) focused on the variable of individualism, which is related both to the desire of people to violate norms and to incentives for achievement (Hofstede 1980), which are characteristics associated with entrepreneurship. Wildeman, et al. (1999) examined the effects of Hofstede's (1980) cultural variables of power distance and uncertainty avoidance on entrepreneurship and showed that they positively influence levels of self-employment.

In general, we may approach the relationship between cultural values and entrepreneurial activity from two different perspectives. These are the supply or "pull" perspectives and the demand or "push" perspectives. On the supply side, we have the "legitimation of entrepreneurship" and the "aggregate psychological traits", and on the demand side, we have the "dissatisfaction perspective" for business start-ups and entrepreneurship in general (Stanworth and Curran, 1973; Verheul, et al., 2002; Thurik, et al., 2008; Wennekers, et al., 2008). The predicted relationship between the "push" and "pull" perspectives is the opposite (Hofstede, et al., 2004; Wennekers, et al., 2008).

The "legitimation of entrepreneurship", or the "legitimation" or "moral approval" of entrepreneurship, focuses on the impact of the norms and institutions on society at large (Etzioni, 1987). The cultural determinants of entrepreneurship may also include "aggregate psychological traits", as more entrepreneurial values in a society can lead to an increase in the number of people displaying entrepreneurial behaviour (Davidsson, 1995, 2004). A third explanation for entrepreneurship is what is called the "dissatisfaction perspective", which, at the macro level, assumes that differences in values between the population as a whole and potential entrepreneurs form the basis for variation in entrepreneurship. Baum et al. (1993) concluded that countries with a high degree of uncertainty are associated with higher rates of self-employment, explaining that the cultural determinants of entrepreneurship as the "push explanation for entrepreneurship". Nooerderhaven, et al. (1999), who used a sample of 22

OECD countries and described the countries with a low degree of uncertainty as "entrepreneurial economies", reached the same conclusion. They concluded that per capita GDP has a strong, negative effect on the rate of business ownership in nine countries characterised by high uncertainty avoidance and no effect in countries with low uncertainty avoidance. On the level of business ownership, Wennekers, et al. (2008) examined the influence of cultural attitudes towards uncertainty avoidance. They identified a strong, positive effect of uncertainty avoidance on business ownership, concluding that high levels of uncertainty avoidance push people into entrepreneurship through self-employment (in line with Baum's hypothesis).

Based on the definitions of the variables used to express cultural background by House et al. (2004), we can assume that societies with high values for performance orientation should be associated with higher levels of entrepreneurship, given that they promote profit and performance improvement in their economies. Such societies value training, development, assertiveness, competitiveness, individual achievement and taking initiative, and entrepreneurship contributes towards these goals.

High values for future orientation should be related to increases in entrepreneurship too. Indeed, such societies tend to achieve economic success, have flexible and adaptive organisations and managers, and favour financial prosperity, which can facilitate new businesses. Furthermore, a decrease in gender-based differences should reflect greater entrepreneurship because more women will have the chance to exercise their entrepreneurial skills. Such societies tend to afford women a greater role in community decision-making and have a higher percentage of women participating in the labour force and in positions of authority. Moreover, it is expected that a positive correlation exists between higher values of assertiveness and entrepreneurship given that aggression and austerity drive global competitiveness. Such societies value success, progress and competition and tend to act and think of others as opportunistic. Generally, collective activity in a society (institutional collectivism) should be positively related to entrepreneurship, as group loyalty is encouraged even if individual goals suffer. In contrast, in-group collectivism is expected to be associated with lower levels of entrepreneurship because, in essence, in-group collectivism is incompatible with competitiveness and the development of free entrepreneurship: it favours conceptualism and small, low-risk businesses. High levels of power distance indicate that economic development occurs only for those who have (mainly) economic power in societies. Consequently, it is expected to have a negative correlation with entrepreneurship. In such societies, only a few people have access to resources, skills and capabilities. Human

orientation is expected to have a positive correlation with entrepreneurship because, in societies with a high level of human orientation and with the primary aim being to make profits, the government's focus should be on individuals. There is expected to be a negative correlation between uncertainty avoidance and entrepreneurship because lower levels of uncertainty avoidance have been repeatedly associated with higher levels of economic activity (Swierczek and Thai, 2003; Hofstede, et al., 2008). Such societies tend to be less calculating when taking risks and show less resistance to change.

3. The Data

The data for the self-employment and the entry density variables, concern the mean performance of each country for the time period of 2008-2009. For the variables expressing cultural background, the reference period is the 1995-1997. There has not been a more recent organised effort to measure the cultural background in so many countries. Moreover, the social stereotypes forming the cultural background may be characterised as long lasting, as the forces that have shaped the construction of the stereotypes are considered exogenous (e.g., climate and environment) (Schwartz, 2009). Thus, cultural values present stability through time. In general, cultural stereotypes present a great resistance towards change and to their own redefinition (Johnston 1996). Therefore, for the period analysed, the variables related to the cultural background may be regarded as constants. Lastly, the data for the variables knowledge creation and knowledge impact concern the year 2009.

Our limited degrees of freedom (due to the small sample we have available because of our limited number of observations on Self-employment and Entry Density rates) do not permit us to deepen our analysis in this respect. We define our variables precisely in Table 1.

Table 1. Definition of variables and data sources[a]

	Variables	Definition	Reference period	Data Source
	Self-Employment	Self employed workers are those workers who, working on their own account or with one or a few partners or in cooperative, hold the type of jobs defined as a "self-employment jobs."	2008-2009	International Labour Organization
	Entry Density	The number of newly registered limited liability companies per 1,000 working age (15-64) people.	2008-2009	The World Bank Entrepreneurship Snapshots 2010 "Measuring the Impact of the Financial Crisis on New Business Registration"
CULT	Performance Orientation	The degree to which a society encourages and rewards its members for performance improvement and excellence.	1995 - 1997	House J. R., et al. (2004)
	Future Orientation	The extent to which individuals engage in future-oriented behaviours, such as delaying gratification, planning and investing in the future.		
	Gender Egalitarianism	The degree to which a society minimises gender inequality.		
	Assertiveness	The degree to which individuals are assertive, confrontational and aggressive in their relationships with others.		
	Institutional Collectivism	The degree to which organisational and societal practices encourage and reward collective distribution of resources and collective action.		
	In-group Collectivism	The degree to which individuals express pride, loyalty and cohesiveness in their organisations or families.		
	Power Distance	The degree to which members of a society expect power to be distributed equally.		
	Human Orientation	The degree to which a society encourages and rewards individuals for being fair, altruistic, generous, caring and kind to others.		
	Uncertainty Avoidance	The extent to which members of an organization or society strive to avoid uncertainty by reliance on social norms, rituals, and bureaucratic practices to alleviate the unpredictability of future events.		
CREATION	Knowledge Creation	It includes four indicators that are the result of inventive and innovation activities: patent applications filed by residents both at the national patent office and at the international level through the Patent Cooperation Treaty; utility model applications filed by residents at the national office; and scientific and technical published articles in peer-reviewed journals.	2009	Global Innovation Index 2011, INSEAD
IMPACT	Knowledge Impact	It includes three statistics representing the impact of innovation activities at the micro and macroeconomic level: increases in labour productivity, the entry of new firms, and spending on software.		

[a] The 45 countries in the sample represent 78.86% of global GDP, 2009 (IMF Database). The countries are Argentina, Australia, Austria, Bolivia, Brazil, Canada, Colombia, Costa Rica, Denmark, Ecuador, Egypt, El Salvador, Finland, France, Georgia, Germany, Greece, Hong Kong, Hungary, Indonesia, Ireland, Italy, Japan, Kazakhstan, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Philippines, Poland, Portugal, Russian Federation, Singapore, Slovenia, South Africa, Korea Rep., Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States, Venezuela.

4. The Methodology Employed

We examine the following two hypotheses.

$$Self\text{-}Employment_i = \beta_0 + \beta_1 * CULT_i + \beta_2 * CREATION_i + \beta_3 * IMPACT_i + \varepsilon_i \qquad (1)$$

$$Entry\ Density_i = \gamma_0 + \gamma_1 * CULT_i + \gamma_2 * CREATION_i + \gamma_3 * IMPACT_i + \varepsilon_i \quad (2)$$

The two hypotheses vary vis-à-vis the dependent variable they use. In the first hypothesis the dependent variable is the Self-Employment rates, while in the second it is the Entry Density rates in the economies. CULT is the Principal Component (PC) that arises from the variables expressing the cultural background, after a Principal Component Analysis (PCA); CREATION refers to the Knowledge Creation and IMPACT refers to the Knowledge Impact.

In order to abstract from the complexity of the cultural background of societies as an explanatory variable, we used the PCA. This methodology allows us to reduce the number of variables representing cultural background, while detecting the structure in the relationships between these variables. Smith (2002) commented that PCA is a way of identifying patterns in data and expressing the data in such a way as to highlight their similarities and differences. More specifically, it is a factor extraction method used to form uncorrelated linear combinations of the observed variables, which is then used to obtain the initial factor solution, when a correlation matrix is singular. The first principal component (PC) has a maximum variance. Successive components explain progressively smaller portions of the variance and are all uncorrelated with each other.

We apply PCA to the group of variables expressing cultural background. The effect of the PCs on Self-Employment and Entry Density is examined through a linear regression using the ordinary least squares method (OLS), as in the two hypotheses presented above. In our linear regression, we used the principal components with the greatest variances (initial eigenvalues>0.97).

To check for endogeneity between the variables used, we use a version of the Hausman test (Hausman, 1978) proposed by Davidson and MacKinnon (1989, 1993), which employs a test statistic for exogeneity by running an auxiliary regression. The null hypothesis states that the model yields consistent estimates and the reported values of p-value state the probability that the test statistic is zero, which would imply the acceptance of the null hypothesis. In this test, we use a set of instrumental variables that are correlated with the

"suspect" variable but not with the error term of the regression that applies Self-Employment or Entry Density as a dependent variable. Only if endogeneity is not present will the OLS estimates be consistent and unbiased. In addition, the partial instrumental variables R^2 are reported to describe how much of the squared residuals can be explained by the instrumental variables. The partial p-value, which is the probability that the F-value for each instrumental variable is zero, is also reported. Both tests describe how good (strong) the instrumental variables are in explaining Self-Employment and Entry Density rates.

If we identify endogeneity between the variables used, the structural system of the equations (one equation for each of the endogenous variables as a dependent variable) will be estimated with the two-stages least squares (2SLS). In this method, as exogenous variables, we will use the variables that seem to have no direct causal path to the endogenous variables, whose disturbance term is correlated with that of the problematic causal variable. This method covers models that violate the ordinary least squares (OLS) regression's assumption of recursivity (when the model involves feedback loops), specifically models in which the disturbance term of the dependent variable correlates with the cause(s) of the independent variable(s). In the first stage, new dependent or endogenous variables are created to substitute for the original variables by using selected instrumental variables, which replace the problematic causal variables so as not to violate the OLS regression's recursivity assumption. In the second stage, the regression is computed in OLS fashion, but with the newly created variables.

Furthermore, a sensitivity analysis on this basic scenario is included. The scope of this experiment is to evaluate the effect of culture and knowledge on Self-Employment and Entry Density rates under changing circumstances in the societies. For each hypothesis, we create eight different possible combinations of cultural background and knowledge in societies, through increasing or decreasing the values of the variables expressing it, where the values of the variables of each group are improved, weakened or remain unchanged. To get improved/ weakened all variables are increased/ reduced by 30% for the countries scoring below/ over the average score of the sample. For the variables expressing cultural background, and more specifically for the variables power distance and uncertainty avoidance which are adverse scored, in order to get improved, their values are reduced by 30% for the countries scoring over the average score of the sample (and vice-versa). Figure 1 represents the plan of the sensitivity analysis.

After the sensitivity analysis, we run a new PCA with the PCs for cultural background variables shaped by new forces for each case. Subsequently, for each case of the sensitivity

analysis, we evaluate the effect of the new PCs in combination with the new variables for knowledge, first on self-employment and then on entry density rates.
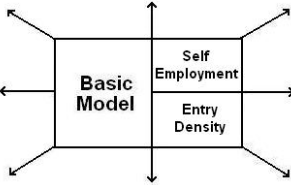
(Case 1)	(Case 2)	(Case 3)
-30% on Culture	0% on Culture	+30% on Culture
-30% on Knowledge	-30% on Knowledge	-30% on Knowledge
(Case 4)		(Case 5)
-30% on Culture	Basic Model — Self Employment / Entry Density	+30% on Culture
0% on Knowledge		0% on Knowledge
(Case 6)	(Case 7)	(Case 8)
-30% on Culture	0% on Culture	+30% on Culture
+30% on Knowledge	+30% on Knowledge	+30% on Knowledge

Figure 1. The sensitivity analysis

In order to reach these goals (and apart from the description of the new findings), a structural change check is performed relating the alternative circumstances to the basic scenario. In effect, for each variable out of the sixteen cases in total of the sensitivity analysis (eight cases for each dependent variable), we construct two groups of 45 observations. These two groups make a new variable for each of the variables used in the two hypotheses. The first (group 1) concerns the variable's prices in the hypothesis, and the second (group 2) concerns the variable's prices for each case of the sensitivity analysis. The estimates concerning the statistical importance of new factors that are created lead us to some conclusions regarding the new configuration and conditions of Self-Employment and Entry Density rates.

5. Empirical Work and Discussion of the Results

In terms of cultural background, four PCs are determined ($CULT_1$, $CULT_2$, $CULT_3$ and $CULT_4$ in Table 2) that explain 32.88%, 25.02%, 13.30% and 10.77% of the total variance and present initial eigenvalues 2.96, 2.25, 1.19 and 0.97 respectively. $CULT_1$ is

determined by the positive effects of performance orientation, future orientation, institutional collectivism, in-group collectivism and uncertainty avoidance, and the negative effects of human orientation. $CULT_2$ is positively shaped by performance orientation, gender egalitarianism, institutional collectivism and human orientation, whereas assertiveness, power distance and uncertainty avoidance have a negative effect. Furthermore, the positive effect of performance orientation, gender egalitarianism, assertiveness, in-group collectivism and power distance and the negative effects of human orientation determine $CULT_3$. Lastly, $CULT_4$ is determined by the positive effects of assertiveness and human orientation.

Table 2 presents the contents of the PCs, i.e., the variables that affect the PC configuration and which have partial correlation values that are greater than 0.3, in terms of absolute values. Table 3 presents the correlations between the variables used.

Table 2. Principal component matrix

	$CULT_1$	$CULT_2$	$CULT_3$	$CULT_4$
Performance Orientation	0.57	0.53	0.39	
Future Orientation	0.85			
Gender Egalitarianism		0.78	0.40	
Assertiveness		-0.48	0.42	0.67
Institutional Collectivism	0.72	0.41		
In-group Collectivism	0.71		0.46	
Power Distance		-0.79	0.34	
Human Orientation	-0.38	0.40	-0.43	0.61
Uncertainty Avoidance	0.81	-0.32		

Note: There are presented only the values of partial correlations that are greater than 0.3 in terms of absolute values.

Table 3 presents the empirical results of the estimated regressions. It is presented the effect of cultural background, knowledge impact and knowledge creation on Self-Employment rates (first column) and on Entry Density rates (second column).

Table 3. The two hypotheses

	Self-employment (1)	Entry Density (2)
c	43.88*** (5.98)	-6.97*** (-4.65)
$CULT_1$	5.70** (2.28)	0.98* (1.85)
$CULT_2$	-3.46* (-1.93)	-0.48 (-1.32)
$CULT_3$	-1.32 (-0.68)	0.84** (2.19)
$CULT_4$	0.96 (0.54)	-0.30 (-0.83)
Knowledge creation	-0.13 (-1.50)	0.01 (0.64)
Knowledge impact	-0.33* (-1.69)	0.32*** (8.00)
Adjusted R^2 F-statistic	44.2% 6.81***	71.0% 17.76***

[a] The parentheses include the t-test statistics for the coefficients of the regressions.

[b] Significance at the 1%, 5% and 10% level, is denoted with ***, ** and *, respectively.

From the estimation of the first hypothesis (column 1, Table 3), it arises that an increase of $CULT_1$ would positively affect the Self-Employment rates in the economies, as it presents a positive and statistically significant estimate. On the contrary, an increase of $CULT_2$ or Knowledge Impact would negatively affect the Self Employment rates. The R^2 of the regression amounts to 44.2%, while according to the F-statistic, the regression is statistically strong. From the second hypothesis (column 2, Table 3), it shows that an increase of $CULT_1$, $CULT_2$ or Knowledge impact would positively affect the Self-Employment rates in the economies, as they present positive and statistically significant estimates. The R^2 of the regression amounts to 71%, while according to the F-statistic, the regression is statistically strong.

Knowledge Creation does seem to affect neither the variable Self-Employment rates nor the variable Entry Density rates. So, it appears that the effect of Knowledge Creation in entrepreneurship is not a short-term one, but instead it affects a much longer time horizon that may reach approximately 10 years. Quite the reverse, what affects both dependent variables is

the direct impact of knowledge as expressed by the Knowledge Impact. Finally, the cultural background of societies seems to affect Self-Employment as well as Entry Density.

Table 4. Correlation matrix

Variable	Self-Employment	Entry density
$CULT_1$	0.60**	-0.23
$CULT_2$	-0.23	-0.17
$CULT_3$	-0.19	0.43**
$CULT_4$	0.06	-0.16
Knowledge Creation	-0.52**	0.13
Knowledge Impact	-0.48**	0.81**

[a] Significance at the 5% level is denoted with **.

[b] The correlations between the PCs expressing cultural background are not reported due to the fact that there is no correlation between them at all (correlation is zero).

Observing the correlation matrix (Table 4), one may think that Self-Employment may be endogenously determined by $CULT_1$, Knowledge Creation or Knowledge Impact, while Entry Density may be endogenously determined by $CULT_3$ or Knowledge Impact. Because of the concern of the existence of endogeneity, we use a version of the Davidson and MacKinnon (1989, 1993) test described above, for these variables. To test the hypothesis, we use an instrumental variable that correlates with the suspect variable but not with the error term of the Self-Employment or the Entry Density equation. We need to determine whether the instrumental variables are weak or are not as robust as the exogeneity test. Choosing the appropriate instrument is a crucial step. We check for the instruments using the correlation matrix, the partial R^2 and the partial F-statistic. All the variables used as instruments are assessed as strong instrumental variables and can be regarded as exogenous with respect to Self-Employment or Entry Density. They present strong correlation with each independent variable but not with Self-Employment or Entry Density and represent a sufficient enough partial R^2 and a partial F-statistic bigger that 10 when regressed on each independent variable but not when regressed on Self-Employment or Entry Density. The results of the exogeneity tests do not suggest that there is endogeneity, as the first stage residuals are not statistically different from zero. Consequently, the estimates we draw from hypotheses 1 and 2 are consistent and unbiased.

Next, we cause a shock in the economies by increasing or decreasing by 30% or maintaining constant the values of the variables expressing cultural background and

knowledge (all possible combinations). For the "new" modified variables of cultural background, we run a new PCA. After the PCA, we create the new variables $CULT_1'$, $CULT_2'$, $CULT_3'$ and $CULT_4'$ for each case of Fig.1. Table 5 shows the PCA results after the decrease or the increase of the variables that represent the cultural background. At the same time we also modify the variables Knowledge Creation and Knowledge Impact as Knowl Creation' and Knowl Impact'.

Table 5. The PCA after the sensitivity analysis

	-30% on Cultural Background				+30% on Cultural Background			
	$CULT_1'$	$CULT_2'$	$CULT_3'$	$CULT_4'$	$CULT_1'$	$CULT_2'$	$CULT_3'$	$CULT_4'$
Performance Orientation	0.312	0.621	0.371	-	-	0.793	-	-
Future Orientation	0.371	-	-0.558	0.567	0.847	-	-	-
Gender Egalitarianism	0.513	-	0.572	-	-0.558	0.680	-	-
Assertiveness	0.596	-0.480	-	-	-	-	-	0.931
Institutional Collectivism	-0.639	-	-	-0.362	-0.589	-	0.352	-
In-group Collectivism	-	0.716	-		0.412	0.621	0.384	-
Power Distance	-0.583	-	-	0.586	-	-0.662	0.405	-
Human Orientation	-	-0.503	0.501	0.399	-0.444	-	-0.695	-
Uncertainty Avoidance	0.520	-	-0.494	-0.368	0.866	-	-	-

Notes: 1) There are presented only the values of partial correlations that are greater than 0.3. 2) The case of -30% on Cultural Background is applied on Cases 1, 4 and 6, while that of +30% on Cultural Background is applied on Cases 3, 5 and 8. In the Cases 2 and 7, where only Knowledge is modified, the powers that shape the cultural background PCs are those in Table 2.

In order to check for the structural change between the two hypotheses and of each case of the sensitivity analysis, we create the variables $CULT_1''$, $CULT_2''$, $CULT_3''$, $CULT_4''$, Knowl Creation'' and Knowl Impact'' (i.e., the difference of the basic scenario from the case of the sensitivity analysis), which arise as values of $CULT_1$, $CULT_2$, $CULT_3$, $CULT_4$, Knowl Creation and Knowl Impact for group 1 and $CULT_1'$, $CULT_2'$, $CULT_3'$, $CULT_4'$, Knowl Creation' and Knowl Impact' for group 2, respectively. The dependent variables Self-Employment and Entry Density are now called Self-Employment'' and Entry Density'', and their values for group 1 are repeated for group 2. Subsequently, a dummy variable is created whose value is 0 for group 1 and 1 for group 2. Following, we create variables dum x $CULT_1''$, dum x $CULT_2''$, dum x $CULT_3''$, dum x $CULT_4''$, dum x Knowl Creation'' and dum x Knowl Impact'' which are the product of the created dummy variable and the variables $CULT_1''$, $CULT_2''$, $CULT_3''$, $CULT_4''$, Knowl Creation'' and Knowl Impact'' respectively.

The shock in the economies produced some statistically significant structural differences. In Table 6 are presented all the regressions of the cases of the sensitivity analysis as well as the structural changes for the eight different cases of figure 1, when Self-Employment is the dependent variable and in Table 7, the same procedure is presented when the dependent variable is the Entry Density rates.

The results of Table 6, regarding the sensitivity analysis and the test for statistically significant structural changes with dependent variable the Self-Employment (hypothesis 1) reveal that there is a significant statistically structural change in all cases where we reduce the cultural background by 30%, when at the same time we reduce by 30% or maintain or increase by 30% the variables expressing the Knowledge of societies (Cases 1, 4 and 6 respectively). In other words, a decrease in the values of the variables that reflect the cultural background has a direct impact on Self-Employment, whichever change may occur in Knowledge. After the sensitivity analysis, the impact of $CULT_1'$ is transformed from positive to negative in Case 1, whilst it disappears in Cases 4 and 6. Likewise, the impact of $CULT_2'$ disappears in all three Cases. Simultaneously, new PCs appear as statistically important: $CULT_3'$ in Cases 4 and 6 (positive effect) and $CULT_4'$ in Case 1 (negative effect). As far as Knowledge is concerned, under the new circumstances, Knowledge Creation affects in a negative and statistically significant way Self-Employment in all 3 cases. At the same time, the negative effect of the variable Knowledge Impact is strengthened (except for Case 6).

Respectively, the results of Table 7, concerning the sensitivity analysis and the test for statistically significant structural changes with dependent variable the Entry Density (hypothesis 2), show that a statistically significant structural change is observed in three different groups of Cases: a) In Cases where we reduce the variables of Knowledge by 30%, when at the same time we reduce by 30% or maintain or increase by 30% the variables that express the cultural background of societies (Cases 1, 2 and 3 respectively). b) In Cases where we increase the variables of Knowledge by 30%, while we reduce by 30% or maintain or increase by 30% the variables expressing the cultural background of societies (Cases 6, 7 and 8 respectively). c) As in hypothesis 1, in Cases where we reduce the cultural background by 30%, while we decrease by 30% or maintain or increase by 30% the variables expressing the Knowledge of societies (Cases 1, 4 and 6 respectively).

In the first group of Cases with dependent variable the Entry Density, the effect of $CULT_1'$ disappears as far as the cultural background is concerned. Likewise, in Case 1 the effect of $CULT_3'$ is also lost, whereas in Cases 2 and 3 its positive impact is reinforced. Regarding the variables of Knowledge, in all three cases the positive impact of Knowledge

Impact on Entry Density is strengthened. In the second group, the positive impact of $CULT_1'$ is lost in Cases 6 and 7, while it is intensified in Case 8. On the contrary, the positive impact of $CULT_3'$ is reduced in Cases 6 and 7, while it disappears in Case 8. At the same time, in Case 6 there are two new PC for cultural background with a negative effect on the Entry Density ($CULT_2'$ and $CULT_4'$). Concerning Knowledge, in all three cases the positive effect of Knowledge Impact is decreased. Finally, regarding the third group, in all three Cases the impact of $CULT_1'$ disappears. Cases 1 and 6 belong in the other two groups and they have been described above. In Case 4, additionally we observe the entry of $CULT_2'$ (with a negative effect on Entry Density), while the impact of $CULT_3'$ remains as it is in the basic model. Lastly, an increase of the positive effect of the Knowledge Impact on the Entry Density is noted.

Table 6. Depended Variable: Self-Employment

	Case 1		Case 2		Case 3		Case 4		Case 5		Case 6		Case 7		Case 8	
	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change
c	61.98*** (6.38)		49.33*** (4.82)		58.91*** (5.68)		52.01*** (7.52)		48.88*** (6.44)		46.36*** (8.20)		40.25*** (6.79)		43.68*** (7.08)	
$CULT_1'$	-0.07** (-0.04)		5.52** (2.23)		3.97 (1.60)		0.25 (0.13)		4.31 (1.66)		0.12 (0.06)		6.11** (2.46)		4.90* (1.88)	
$CULT_2'$	2.88 (0.18)		-3.47* (-1.93)		-2.58 (-1.41)		2.33 (1.12)		-2.30 (-1.25)		1.86 (0.89)		-3.45* (-1.92)		-2.07 (-1.12)	
$CULT_3'$	3.09 (0.19)		-1.97 (-1.09)		-1.62 (-0.93)		3.55* (1.77)		-0.83 (-0.45)		3.90* (1.92)		-3.45 (-1.92)		-0.72 (-0.38)	
$CULT_4'$	-3.54** (-0.22)		0.78 (0.44)		3.12 (1.58)		-3.09 (-1.59)		2.72 (1.32)		-3.17 (-1.59)		1.05 (0.59)		2.45 (1.17)	
Knowl Creation′	-0.41*** (-0.44)		-0.25* (-1.87)		-0.42*** (-2.89)		-0.22** (-2.50)		-0.23** (-2.38)		-0.15** (-2.18)		-0.08 (-1.27)		-0.15** (-2.09)	
Knowl Impact′	-0.88*** (-0.34)		-0.54 (-1.59)		-0.76** (-2.24)		-0.49** (-2.66)		-0.38* (-1.95)		-0.30** (-2.45)		-0.20 (-1.61)		-0.22* (-1.69)	
dum x $CULT_1''$		-5.15* (-1.65)		0.73 (0.26)		0.76 (0.27)		-4.94 (-1.59)		-0.30 (-0.11)		-5.37* (-1.74)		-0.42 (-0.15)		-0.84 (-0.30)
dum x $CULT_2''$		5.18* (1.95)		0.01 (0.00)		1.46 (0.58)		5.29* (1.98)		1.32 (0.52)		5.18* (1.93)		0.03 (0.01)		1.37 (0.54)
dum x $CULT_3''$		4.51 (1.61)		-0.99 (-0.39)		-0.92 (-0.36)		4.78* (1.72)		0.08 (0.03)		5.16* (1.86)		0.49 (0.19)		0.61 (0.24)
dum x $CULT_4''$		-5.03* (-1.96)		-0.09 (-0.03)		1.57 (0.60)		-4.41* (-1.71)		1.56 (0.58)		-4.24 (-1.62)		0.06 (0.02)		1.49 (0.55)
dum x Knowl Creation″		-0.16 (-1.15)		-0.08 (-0.59)		-0.18 (-1.24)		-0.04 (-0.40)		-0.07 (-0.62)		-0.002 (-0.02)		0.03 (0.29)		-0.02 (-0.25)
dum x Knowl Impact″		-0.04 (-0.25)		-0.06 (-0.39)		-0.005 (-0.03)		0.03 (0.23)		0.06 (0.48)		0.08 (0.73)		0.04 (0.41)		0.10 (0.89)
Adjusted R^2	45.6%	43.4%	44.9%	44.5%	47.5%	45.0%	43.8%	43.6%	44.8%	44.4%	41.5%	42.9%	43.4%	43.8%	42.7%	43.6%
F-statistic	7.14***	6.69	6.97***	6.95***	7.64***	7.06***	6.70***	6.73***	6.94***	6.92***	6.19***	6.57***	6.61***	6.77***	6.47***	6.73***

[a] The parentheses include the t-test statistics for the coefficients of the regressions.

[b] Significance at the 1%, 5% and 10% level, is denoted with ***, ** and *, respectively.

[c] In the structural changes, the variables $CULT_1''$, $CULT_2''$, $CULT_3''$, $CULT_4''$, Knowl Creation′′ and Knowl Impact′′ are also included but do not display their estimates because they are the same as in the case of the sensitivity analysis, which is presented.

Table 7. Depended Variable: Entry Density

	Case 1		Case 2		Case 3		Case 4		Case 5		Case 6		Case 7		Case 8	
	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change	Sensitivity Analysis	Structural change
c	-11.62*** (-4.11)		-10.35*** (-4.02)		-11.96*** (-4.25)		-8.49*** (-5.52)		-8.05*** (-4.91)		-5.45*** (-4.37)		-4.18*** (-3.37)		-4.91*** (-3.63)	
$CULT_1'$	0.13 (0.24)		0.70 (1.13)		0.78 (1.22)		-0.24 (-0.57)		1.23** (2.24)		-0.21 (-0.48)		0.78 (1.46)		1.09* (1.92)	
$CULT_2'$	-0.87 (-1.41)		-0.31 (-0.70)		0.25 (0.51)		-1.01** (-2.12)		0.13 (0.33)		-0.83* (-1.73)		-0.59 (-1.57)		-0.07 (-0.17)	
$CULT_3'$	0.72 (1.27)		1.50*** (3.43)		1.39*** (3.16)		0.84* (1.90)		0.78** (2.05)		0.81* (1.80)		0.72* (1.77)		0.64 (1.59)	
$CULT_4'$	-0.09 (-0.18)		-0.14 (-0.32)		0.73 (-1.38)		-0.69 (-1.65)		-0.45 (-1.01)		-0.76* (-1.76)		-0.39 (-1.08)		-0.26 (-0.57)	
Knowl Creation'	0.04 (1.22)		0.03 (0.89)		0.06 (1.56)		0.02 (1.15)		0.02 (1.18)		0.01 (0.81)		0.004 (0.31)		0.01 (0.67)	
Knowl Impact'	0.55*** (5.71)		0.51*** (5.85)		0.55*** (5.94)		0.36*** (8.69)		0.34*** (8.03)		0.23*** (8.43)		0.20*** (7.56)		0.22*** (7.51)	
dum x $CULT_1''$		-1.01 (-1.30)		-0.85 (-1.31)		-1.01 (-1.50)		-1.31** (-1.99)		0.02 (0.03)		-1.04 (-1.58)		0.46 (0.78)		0.60 (1.00)
dum x $CULT_2''$		-0.06 (-0.09)		0.13 (0.22)		0.49 (0.83)		-0.42 (-0.73)		0.57 (1.07)		-0.44 (-0.76)		-0.11 (-0.21)		0.48 (0.88)
dum x $CULT_3''$		-0.12 (-0.18)		0.82 (1.45)		0.71 (1.20)		0.01 (0.02)		0.01 (0.03)		-0.06 (-0.11)		-0.42 (-0.80)		-0.37 (-0.70)
dum x $CULT_4''$		0.34 (0.54)		0.08 (0.14)		-0.21 (-0.35)		-0.33 (-0.61)		-0.11 (-0.20)		-0.53 (-0.96)		-0.06 (-0.11)		-0.03 (-0.06)
dum x Knowl Creation''		0.007 (0.19)		-0.002 (-0.06)		0.01 (0.41)		0.002 (0.09)		0.007 (0.30)		0.01 (0.43)		0.008 (0.41)		0.01 (0.56)
dum x Knowl Impact''		0.08** (2.28)		0.09** (2.57)		0.08** (2.16)		0.001 (0.04)		-0.005 (-0.18)		-0.06*** (-2.45)		-0.06** (-2.46)		-0.06** (-2.50)
Adjusted R^2	45.8%	57.1%	58.6%	64.2%	55.9%	62.2%	66.9%	68.8%	68.9%	69.9%	65.5%	68.1%	68.8%	69.1%	66.1%	68.2%
F-statistic	6.76***	10.21***	10.65***	13.39***	9.67***	12.37***	14.81***	16.26***	16.10***	17.06***	13.97***	15.74***	16.09***	16.48***	14.35***	15.83***

[a] The parentheses include the t-test statistics for the coefficients of the regressions.

[b] Significance at the 1%, 5% and 10% level, is denoted with ***, ** and *, respectively.

[c] In the structural changes, the variables $CULT_1''$, $CULT_2''$, $CULT_3''$, $CULT_4''$, Knowl Creation'' and Knowl Impact'' are also included but do not display their estimates because they are the same as in the case of the sensitivity analysis, which is presented.

6. Conclusions

This paper attempts to analyse the effects of knowledge and cultural background on entrepreneurship and more specifically on two different types of entrepreneurial measures: the Self-employment rates and the Entry Density rates. Furthermore, a sensitivity analysis is conducted to examine how the new conditions shaped after the changes in the structure of knowledge and cultural background of the societies affect the self-employment and the entry density rates.

To a great degree, this paper succeeds in highlighting the importance of knowledge and cultural background in entrepreneurship. The interceptive and promoting factors of entrepreneurship are defined with considerable clarity to highlight the importance that the improvement of the special conditions of knowledge and culture would have in the way the Self-employment and the Entry Density rates are formed.

On the one hand, Knowledge Impact affects negatively the Self-Employment rates and positively the Entry Density rates in the economies. On the other hand, Knowledge Creation does not seem to affect the two entrepreneurship variables, as its effect in entrepreneurship is in a long-term (it can reach almost 10 years) and not a short-term one. Simultaneously, the empirical results confirm the effect of cultural background on entrepreneurship, as the cultural background of societies seems to seriously affect both Self-Employment and the Entry Density, depending on the nature of PCs.

Furthermore, sensitivity analysis, through examining all possibilities, has established the effects of special circumstances that improve or worsen societies as far as promoting and interceptive factors are concerned. Reducing the values on the variables that reflect the cultural background has a direct impact on the Self-Employment and the Entry Density rates whichever may be the changes made to Knowledge. Under these new circumstances, the negative impact of the variable Knowledge Impact on the Self-Employment rates is strengthened, while Knowledge Creation affects them in a negative way. Simultaneously, Knowledge Creation seems not to play any role at the Entry Density rates. Moreover, increasing or decreasing the variables representing Knowledge has a direct impact on the Entry Density rates no matter the level of increase or decrease occurring on the cultural background of societies (Cases 1-3, 6-8).

A shortcoming of the present paper is the small sample of countries available, which leads to limited degrees of freedom. This limitation is the result of a lack of extensive data on the variables related to entrepreneurship. Furthermore, the sample was reduced in an effort to find common data among many countries for the variables used. Finally, one may think that the data are not all from the same period of time. However, only cultural background refers to the period 1995-1997, but we consider cultural background as long-lasting in character as cultural values present stability through time.

The present paper may be further extended by providing entrepreneurial policies, analysing the contribution of culture and knowledge in the development of entrepreneurship, or it could include other characteristics of societies and economies that can affect entrepreneurship levels (institutional trust, interpersonal trust, transaction characteristics, economic institutions, etc.).

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