

**SOCIAL CAPITAL, PERSONAL VALUES AND ECONOMIC
DEVELOPMENT: EFFECT ON INNOVATION. AN
INTERNATIONAL ANALYSIS**

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SOCIAL CAPITAL, PERSONAL VALUES AND ECONOMIC DEVELOPMENT: EFFECT ON INNOVATION. AN INTERNATIONAL ANALYSIS

Although it is widely accepted that innovation plays an important role in economic growth and development, which factors influence innovation remains an important question of debate in the economic literature. This article focuses on the influence exerted by social capital (SC) and personal values (PV), given the lack of studies that jointly incorporate these two variables. This paper attempts to fill this gap by using a methodology that additionally includes the national income of the country as a moderating factor on innovation. Using data from the World Value Survey, our study finds that the influence of SC on innovation is not as relevant as expected, and that the effect of personal values is moderated by the level of economic development. This finding contributes to a better understanding of the role played by SC and PVs in the economic development process via their effects on innovation, with the consequent practical implications for the design of innovation policy.

1. Introduction

It has been commonly accepted, ever since Schumpeter's work, that innovation plays an important role in economic growth and development (Baumol, 1968; Fagerberg *et al.* 2009). Research has recently concluded that innovation has also become an essential factor for entrepreneurship due to the globalisation process and the growing need for knowledge of a more complex nature (Audretsch & Thurik, 2001). From this perspective, innovation is clearly seen as a central driving force that fosters competitiveness (Acs & Szerb, 2011).

Moreover, the focus on innovation has been moving from engineering theories to social theories, the main reason being that innovation today requires the participation of various actors, such as firms and other public and private institutions, including

universities (Landry *et al.*, 2002; Matvejeva, 2014; Tigabu *et al.*, 2015; Doloreux *et al.*, 2016). In this way, several studies have analysed the influence exerted by certain socio-cultural factors on the innovation process. Specifically, research has focused on Social Capital (SC) (Dhakli & De Clerq, 2004; Doh & Acs, 2009; Murphy, 2002; Kaasa, 2009; Ivančič *et al.*, 2014; Bjørnskov & Méon, 2015) and personal values (PVs) (Dollinger *et al.*, 2007; Lebedeva *et al.*, 2013; Efrat, 2014).

These socio-cultural factors differ, but at the same time are, in a certain sense, linked. SC refers to social relationships, trust and reciprocity between individuals, organizations, and societies (Bourdieu, 1986; Putnam, 1993). However, PVs are defined as the goals and motivations that serve as a guiding principle in people's lives and societies (Rokeach, 1973; Kirmanoğlu & Başlevent, 2012; Bilsky *et al.*, 2015). In this way, SC would explain how people relate to each other and PVs would explain their motivations to relate, and also to behave, in general, in a certain manner. However, the aforementioned research regarding the link between SC or PVs and innovation was designed without considering both SC and PVs simultaneously, and presented contradictory results in many cases.

For instance, several studies point out that SC promotes national innovation in certain countries (Dakhli & De Clerq, 2004; Doh & Acs, 2009; Kaasa, 2009; D'Agostino & Moreno, 2017), although it is also recognized as having a negative effect on both innovation and economic growth since strong ties between people may prevent the success of business initiatives in society (Portes, 1998; Woolcock, 1998). In the same way, while there seems to be a consensus that innovation seldom emerges in conservative cultures since it would entail major social changes (Shane, 1993; Pasimeni, 2007; Taylor

& Wilson, 2012), other studies find contradictory results regarding the link between the PVs of universalism or individualism and innovation (Sagiv, 2002; Shane, 1992, 1993).

Therefore, the main aim of this research is to carry out an analysis on the influence of SC and PVs on national innovation, while considering those two socio-cultural factors together. The intention is to clarify, firstly, whether both factors can take part in the same structure to explain innovation and, secondly, whether both factors together reinforce or weaken innovation.

Nevertheless, this research takes another step further with a second aim: the inclusion in the analysis of the role of the national income level in a brand new way. Although prior research has frequently considered certain economic measures, and specifically national income level, as control variables in the analysis of innovation (Kaasa, 2009), we will study whether there are any interaction effects between the national income level with SC and PVs. In this way, we will be able to clarify whether the country income level reinforces or inhibits the possible influence of these two socio-cultural variables on innovation. In this context, support can be found in certain studies that already indicate SC and PVs individually as factors that vary depending on the level of socio-economic development (Woolcock, 1998; Inglehart, 2007).

In order to reach these two objectives, after a review of the literature on the role of SC, PVs and the country income level in national innovation, the hypotheses established will be tested with an empirical analysis using data from the World Bank Group and the World Value Survey wave 6 (2010-2014). This second dataset includes several items to measure both SC and PVs in countries with different income levels.

A confirmatory factor analysis with structural equations has been firstly carried out to test the scales that measure the dimensions of SC and PVs. The study is then completed with a regression analysis in which national innovation will be explained through SC, PVs, and the country income level, by taking into account the interaction effects of the latter with these two socio-cultural factors.

2. Theoretical framework

2.1 Innovation and socio-cultural factors

Schumpeter defined innovation in a broad sense, by identifying it with new combinations, not only in products and processes, but also in the organization of a company, the distribution of products, and the supply of resources (Schumpeter, 1934). More recently, this definition inspired the Oslo Manual's definition of innovation, which has become the reference for various international surveys (OECD, 2005)

From a macroeconomic point of view, innovation has also been considered as an important factor in explaining economic growth and development (Baumol, 1968; Fagerberg *et al.*, 2009; Rubalcaba *et al.*, 2016). Today, innovation is also viewed as essential in a new economy based on entrepreneurship and, therefore, as a driving force that fosters competitiveness (Audretsch & Thurik, 2001; Acs & Szerb, 2011; Barata & Fontainha, 2017). However, this conception of innovation continues changing with the evolution of the global economy. According to the linear model, innovation was seen as an event based on technical solutions in which knowledge creation was isolated from the rest of the human activity because collaborative elements were seen as non-relevant (Tura & Harmaakorpi, 2005). Nevertheless, knowledge is viewed nowadays as the result of a non-linear cumulative learning process. Moreover, theories of innovation have evolved

toward social theories, since the emergence of knowledge-based innovations requires different knowledge from various actors (Landry *et al.*, 2002). Indeed, these actors, such as firms or other public and private institutions, establish linkages of interdependence, thereby creating a network, or what is known as an “innovation system” (Tigabu *et al.*, 2015).

This current conception of innovation incorporates certain elements of the theoretical framework of Institutional Economics that reinforce the role played by certain socio-cultural factors in the innovative behaviour of territories. The core of this framework is the notion of institution, viewed in a broad sense: “*institutions are the rules of the game in a society, or more formally, institutions are the constraints that shape human interaction*” (North, 1990, p.3). According to North, institutions can be formal (such as Constitutions, common laws, and contracts) or informal (such as codes of conduct, attitudes, and values). The former are subordinate to the latter, which come from socially transmitted information and are a part of the heritage that we call culture (North, 1990; Davis & Williamson, 2016). The important role attributed to formal and informal institutions is due to their influence on the goals and beliefs of individuals, groups and organizations, thereby reducing uncertainty.

Under this framework, several studies have analysed the influence exerted by certain socio-cultural factors on national innovation. In this respect, two important factors of this kind have been underlined by this specific literature: Social Capital and Personal Values (Lebedeva *et al.*, 2013; Laursen *et al.*, 2012; Dakhli & De Clercq, 2004).

2.2 Social capital and innovation

Social Capital (SC) refers to social relationships, trust and reciprocity between individuals, organizations or societies (Bourdieu, 1986). According to Lin, SC emerges from a process of investment in human relationships, for which resources and, more specifically, time is required (Lin, 2003). Therefore, SC can be accumulated and can also be depreciated or even destroyed in the same way as physical capital (Putnam, 1993, 2000).

As a consequence of the accumulation of SC, a stock of intangible assets emerges, such as easier access to information, better coordination of activities, lower transaction costs, and easier collective decision actions, emerges (Grootaert, 2001; Cowers *et al.*, 2018). Additionally, this accumulation of SC can enable access to other forms of capital, such as human capital (Coleman, 1988).

SC can be viewed both at a firm level and at an aggregate level (Grootaert, 2001). On the one hand, SC can stimulate certain attitudes and decisions of entrepreneurs, such as the start-up or the growth of the business, (Lin, 2003; Davidsson & Honig, 2004; Murphy, 2002; Camps & Marques, 2014; Yang *et al.*, 2014). On the other hand, SC fosters potential benefits for a society, such as economic growth and development (North, 1990; Knack & Keefer, 1997; Dakhli & Clerq, 2004; Bjørnskov & Méon, 2015; Jiang & O'Neill, 2018). Therefore, it appears that SC could also be considered as a factor to explain innovation because it could lead to the accumulation of knowledge and the reduction of uncertainty both at firm and at aggregate level.

This current research is focused on the possible influence of SC on innovation at an aggregate level. To this end, three important related dimensions of SC have been taken into account: *networks, social norms of reciprocity, and social trust* (Bourdieu, 1986; Putnam, 1993). These three dimensions are usually studied from one of two theoretical

perspectives: differentiating them either according to the strength of the ties (Granovetter, 1983, 1985) or according to their tangible or intangible nature (Uphoff, 2000). On the one hand, if we consider the strength of the ties, then there are two kinds of SC: bridging SC characterised by weak ties, and bonding SC characterised by strong ties (Portes, 1998; Woolcock & Narayan, 2000; Leonard, 2004). On the other hand, if we consider their tangible nature, then there are two kinds of SC: structural SC characterised by a tangible nature, and cognitive SC characterised by an intangible nature (Grootaert & Bastelaer, 2001; Nahapiet & Ghosha, 1998; Liñán & Santos, 2007; Dinesen *et al.*, 2014). Given that PVs constitute a cognitive factor, this latter classification of SC is selected for use herein.

In this way, networks are the structural component of SC (Dinesen *et al.*, 2014). They are composed of linkages between individuals or groups of individuals that give rise to vertical and horizontal associations or institutions. The higher the number of such associations, the greater the capacity of community members not only to overcome opportunism, but also to collaborate for mutual benefit.

Secondly, both social trust and social norms of reciprocity are the cognitive components of SC (Uphoff, 2000; Dinesen *et al.*, 2014). They also contribute towards cooperation and, therefore, to economic growth and development (Dasgupta, 2012; Vasilaky & Leonard, 2016). Nevertheless, a number of studies of SC tend to use these dimensions as similar, although they are indeed very different. In general, trust relies on strong consensus and familiarity with behavioural patterns, whereas norms of reciprocity rely on mutual acceptance of procedural norms and they do not necessarily imply consensus between actors (Gundelach & Traunmuller, 2014). In general, social norms of reciprocity imply that one should forgo self-interest and act in the interest of the collective (Coleman, 1988).

Furthermore, it is important to differentiate between two kinds of social trust that seem to have a positive correlation to each other, although no consensus has been reached concerning this question due to their different nature (Uslaner, 2008; Kuovo, 2011). On the one hand, *generalised trust* expresses to what extent people rely on each other, including those who do not personally know one another. On the other hand, *institutional trust* refers to positive perceptions of the fairness and effectiveness of state institutions and their officials, politicians and organizations (Filip *et al.*, 2015).

Several studies have specifically analysed the link between the three aforementioned dimensions of SC and innovation, although with contradictory results. In fact, the same dimensions failed to explain innovation in a consistently similar direction and in similar situations (Dakhli & De Clerq, 2004; Doh & Acs, 2009; Kaasa, 2009, D'Agostino & Moreno, 2017). Nevertheless, the bases of those links are sufficiently relevant to halt the not complete rejection of the possible role of SC on innovation. Some of these bases are explained below as justifications for the following four hypotheses.

On the one hand, in the case of networks, the basis for the possible influence of SC on innovation is related to the emergence of the bottom-up approach to economic development (Stohr, 1981) and later with the emphasis on “flexible specialization systems” (Piore & Sabel, 1984) and the “innovative milieu” (Maillat, 1988). In general, these theories explain that a network of small firms and institutions localised in a specific region acts as a seedbed for an exchange of ideas that leads to innovation and economic development. A similar argument could be used to justify the emphasis on a “national system of innovation” to support the innovative performance of firms (Acs *et al.*, 2014). In this respect, according to certain studies, those business networks could be the result of the so-called *civic networks* of voluntary engagement (Wolfe & Nelles, 2008). The

presence of networks of civic associations could promote the development of local clusters and contribute towards the degree of “institutional thickness” in a specific economy, fostering the innovative performance of local firms (Crescenzi *et al.*, 2013).

Therefore, the following hypothesis is established:

H1: A positive relationship between the engagement of people in civic associations and innovation exists: the higher the level of engagement in civic associations, the higher the level of national innovation.

On the other hand, the influence of social trust on innovation could arise from the fact that this trust is essential for a reduction of uncertainty and for the interaction and communication between individuals and organizations. Trust could be indispensable for the creation of a social environment in which ideas are freely generated, honestly assessed, and collectively transformed into profitable new products and services (Dovey, 2009). Regarding the various kinds of social trust, generalized trust would be closely connected to innovation since it would influence the improvement of communication channels, the reduction of risk and uncertainty, and the encouragement of knowledge sharing and cooperation (Dovey, 2009; Doh & Acs, 2009; Crescenzi *et al.*, 2013).

Therefore, a second hypothesis is established:

H2: A positive relationship between generalized trust and innovation exists: the higher the level of generalized trust, the higher the level of national innovation.

Regarding the possible role of *institutional trust*, the basis for its influence on innovation is related to the fact that science, politics, regulatory bodies, industry, and environmental and consumer organizations would provide important information for the

valuation of innovative technologies when there is an absence of personal experience (Peters *et al.*, 2007). Additionally, positive institutional trust, based on effective institutional support through business incubators, science parks, and industry clusters, could facilitate networking among firms and innovations (Schott & Jensen, 2016). Therefore, the third hypothesis of this study is the following:

H3: A positive relationship between institutional trust and innovation exists: the higher the level of institutional trust, the higher the level of national innovation.

Finally, the influence of social norms of reciprocity on innovation would be based on their capacity to stimulate cooperation through the subordination of self-interest to that of society. More specifically, since social norms of reciprocity would imply the mutual acceptance of procedural norms, commitment to civic behaviour would usually be seen as a sign of reciprocity that is essential in fostering innovation both at firm level (Yan & Yan, 2013) and at aggregate level (Doh & Acs, 2009; Kaase, 2009). This is due to the fact that commitment leads to long-term relationships between people and organizations and enhances their confidence in each other (Gundlach *et al.*, 1995). Therefore, the following fourth hypothesis is established:

H4: A positive relationship between social norms and innovation exists: the higher the level of commitment to civic behaviour, the higher the level of national innovation.

2.3 Personal values and innovation

Researchers have shown interest in PVs since 1950 (Rokeach, 1973; Inglehart, 1997). Personal Values are defined as the goals and motivations which serve as a guiding

principle in people's lives (Rokeach, 1973; Bilsky *et al.*, 2015). They emerge from two sources. The first is that of inborn temperaments (Rokeach, 1973; McCrae *et al.*, 2000), which constitutes a limit on the value priorities that a group or society can transmit successfully. The second refers to the social experience. Thus, people with similar ages, locations, genders or jobs, etc., can share their value priorities. However, their personal experiences (trauma, relationships with parents, illness, etc.) can shape this pattern (Inglehart, 1997).

These two origins explain why PVs vary their degree of importance among people, creating different priorities among them. Therefore, whereas a particular value can be very important to one person, it can be less important to another person. In this sense, the existence of different motivational bases may help to understand the different actions developed by individuals (Rokeach, 1973), as PVs act as an antecedent of behaviour (Glew, 2009). In this context, comparisons of value priorities of groups of individuals can explain differences between their levels of innovation (Shane, 1993; Lebedeva *et al.*, 2013).

There have been various attempts to structure and measure PVs of individuals. Of these, three proposals have been widely accepted among researchers and are taken as a reference in numerous studies: Hofstede (1991), Inglehart (1971), and Schwartz (1992). This study is focused on the Values Theory defined by Schwartz as it constitutes the framework over which many comparisons at a cross-national level are based (WVS, 2013, 2014; European Social Survey, 2012, 2014; Liñán & Fernández, 2014; Davis & Williamson 2016; Beugelsdijk & Klasing 2016).

Schwartz's contribution consists of the definition of a human value system composed of a set of basic values that are recognized in all societies. To this end, he

identifies a set of single values collected in ten PV types present in all people, although varying in importance, that guide the behaviour of an individual or a group (Schwartz, 1992).

The author theorizes that these ten value types are ordered in a two-dimensional circle structure where opposite values are in conflict and adjacent values are compatible (Figure 1). For instance, actions in pursuit of hedonistic values are in conflict with those in pursuit of traditional values and are compatible with self-direction and power values. This theoretical framework has been empirically tested by said author with a survey covering 210 samples of 67 countries (Schwartz, 1992), and later by a great number of researchers (see Bilsky *et al.*, 2011; Knafo *et al.*, 2011).

FIGURE 1 AROUND HERE

In order to organize the entire content of the circle, the values have been collected in two main dimensions. This last proposition has been widely accepted and used in empirical studies even more frequently than the distinct value types themselves (Bilsky *et al.*, 2011; Dobewall & Strack, 2014). The two dimensions are (Schwartz, 2012):

- *Openness (to Change) - Conservation*: captures the conflict between values that emphasize independence of thought and action, and readiness for new experiences (self-direction, stimulation) on the one hand, and values that emphasize order, self-restriction, preservation of the past, and resistance to change (security, conformity, tradition) on the other hand.
- *Self-Transcendence - Self-Enhancement*: captures the conflict between values that emphasize concern for the welfare and interests of others (universalism, benevolence) on the one hand, and values that emphasize the

pursuit of one's own interests and relative success and dominance over others (power, achievement) on the other hand.

Regarding the relationship of PVs with innovation, the majority of studies have been developed in the psychology and management field and from a microeconomic perspective (Daghfous, 2007; Hanel & Wolfradt, 2016). However, a number of patterns have been found on carrying out international and cross-national analyses. Firstly, as innovations are associated with some kind of change and uncertainty, those countries where people with strong uncertainty avoidance predominate are more resistant to innovation (Shane, 1993; Waarts & Van Everdingen, 2005). Various researchers have found that societies characterized by values of openness to change are more innovative than those oriented towards conservation values. More specifically, these researchers conclude that innovative societies are most likely to endorse the self-direction and stimulation values and to reject tradition, security, and conformity values, all of which anchor the openness to change versus conservation dimension (Dollinger *et al.*, 2007; Lebedeva *et al.*, 2013).

Secondly, although there are several studies that relate high rates of creativity and innovation with the value of universalism (Shane, 1992, 1993; Sagiv, 2002), there is also consistent literature that relates innovation with individualism. According to Hofstede (2001), individualistic groups are characterized by weak relations between individuals, and it is assumed that everyone's responsibility is to take care of oneself and one's family. In contrast, where collectivist values predominate, people are connected to each other through strong and cohesive groups that protect them throughout their life; and it is assumed that people are loyal to these groups (Kassa and Vali, 2008). In this context, certain authors (Markus & Kitayama, 1991; Heine *et al.*, 1999) conclude that collectivist

societies could be identified with societies characterized by self-transcendence values (universalism and benevolence), and individualistic societies with societies where self-enhancement values (power and achievement) predominate.

In this respect, individualistic societies are found to be more innovative than collectivist societies (Shane, 1992, 1993; Williams & McGuire, 2010; Taylor & Wilson, 2012). The explanation is that innovation and creation emerge in an individual, and the rest of the people can only be supportive or not (Williams & McGuire, 2010). In addition to this, people from societies where individualistic values predominate feel freer and have a higher motivation to put new initiatives into practice, the reason being that they expect a higher reward than they would in a collectivist society, where the recompense is enjoyed and distributed among the whole group of people because the contribution of an individual belongs to the organization (Shane, 1992; Herbig & Dunphy, 1998). Moreover, in collectivist societies, the individual has the commitment to be loyal to their organization, which is translated into a lack of information exchange, a key factor for innovation (Herbig & Dunphy, 1998; Landes, 2006).

Based on the theory reviewed above, and using Schwartz's terminology, the following set of hypotheses is formulated to be tested in the empirical analysis:

H5: A negative relationship between conservatism and self-transcendence and innovation exists: the higher the level of conservatism and self-transcendence, the lower the level of national innovation.

H6: A positive relationship between openness to change and self-enhancement on the one hand, and innovation on the other hand, exists: the higher

the level of openness to change and self-enhancement, the higher the level of national innovation.

2.4 The moderating role of the country income level

Following Rostow's theory of economic growth (Rostow, 1960), Porter *et al.* (2002) define competitiveness according to the economic development of countries, and distinguish between three specific stages: factor-driven stage, efficiency-driven stage, and innovation-driven stage. In this way, economic development "*means increasingly sophisticated ways of producing and competing and implies the evolution from a resource-based to a knowledge-based economy*" (Wenneker *et al.*, 2005:294).

Countries that reach the third stage usually have a great capacity to innovate and win global markets with their technological innovations. However, this third stage is also related to high-income levels in terms of Gross Domestic Product per capita, since countries with more economic resources per capita are better able to transform inputs into new technology. Therefore, in the context of the influence of SC and PVs on innovation at the aggregate level, considerable differences are expected in the level of innovation across countries depending on their income level. Indeed, certain indicators of innovation, such as the Global Innovation Index, confirm this conclusion (Dutta *et al.*, 2015).

By taking these considerations into account, the studies analysing the link of SC and PVs with national innovation have not ignored the influence of certain economic factors on innovation, such as the country income level. In fact, these studies have usually found these economic factors to be statistically significant and positive (Dakhli & De Clerq, 2004; Doh & Acs, 2009; Kaasa, 2009; Shane, 1993; Taylor & Wilson, 2012; Efrat,

2014) (Appendix 1 offers a summary of the studies on this field). Therefore, the following hypothesis is established:

H7: A positive relationship between the country income level and innovation exists: the lower/higher the level of the country income level, the lower/higher the level of national innovation.

In addition, it is important to consider whether there is a simultaneous moderating effect of the country income level on the relationship between the socio-cultural factors and national innovation. Regarding SC, the literature has found that the endowment of socio-cultural factors that promote economic growth is higher in high-income regions in comparison to low-income regions. This is the case as studied by Putnam on the relationship between SC and economic development in Italy. This study found that high-income northern regions of Italy, in comparison to low-income southern regions, exhibited higher levels of SC and, consequently, higher economic development (Putnam, 1993). Similarly, Knack and Keefer showed that lower levels of trust and civic norms were narrowly correlated with lower income levels and, at the same time, those measures of SC exerted an impact on the R&D investments, explaining the lower or higher growth in country income (Knack & Keefer, 1997).

Regarding PVs, the literature also recognizes that societies change their value systems as they advance in their socio-economic development and democratization levels (Inglehart & Baker, 2000; Fontaine *et al.*, 2008). Along these lines, there is a group of studies that, using the PVs defined by Schwartz, specifically analyses the change of values in the Economies of Transition from systems of communism to capitalism (Schwartz & Bardi, 1997; Herdin & Aschauer, 2013). They concluded that societies in countries with communist antecedents were more conservative. In addition, other studies,

based on societal-level dimensions instead of personal dimensions, obtained results that indicated that different countries are characterized by different cultural values depending on the level of socio-economic development, whereby those less developed countries were more closely associated to higher conservative values (Inglehart, 2007).

Consequently, taking into consideration the relationship between the levels of socio-economic development and innovation on the one hand, and SC and PVs and innovations on the other hand, we propose that there could be a moderating effect on their influence over the innovation. In this way, the following hypothesis is formulated:

H8: The country income level moderates the effects that SC and PVs have on innovation.

3. Methodology, empirical analysis and findings

3.1 Data and methodology

In order to test the hypotheses, an empirical analysis has been carried out using secondary data from the World Bank Group (WBG) and the World Values Survey (WVS) wave 6 (2010-2014). From the WBG, this research takes two specific items of data: a) the country's classification according to the national income level defined in 2013 by this institution; and b) the national innovation, which has been measured taking the R&D national expenditure as a percentage of GDP. This latter indicator is used to measure innovation in this study instead of the number of patents since limitations of patents may become greater across countries with major differences both in national income and in social and cultural characteristics, such as is the case in the sample used in this research. Among those limitations, Acs and Audretsch (2005) highlight the difficulties of using patents as a means for capturing all the innovations carried out. Additionally, Mansfield

(1984) had already pointed out the differences and instability of the propensity to patent across business and industries.

From the World Values Survey (WVS), the research uses specific data on those socio-cultural factors described in the theoretical framework: SC and PVs. The WVS is a worldwide survey on the social and cultural values influencing social and political life, and it has previously been used in other research that links socio-cultural factors and innovation (Knack & Keefer, 1997; Doh & Acs, 2009). The survey is conducted by means of personal interviews about beliefs and values on people living in countries with different culture and socio-economic and political situations worldwide. Our study uses a subsample of the WVS with 86,274 personal interviews of 60 countries (Appendix 2). Data corresponds to the revised questionnaire of 2012 for the World Values Survey (WVS) wave 6 (2010-2014). The research focuses on the items associated to both SC and PVs as shown in Table 1 (for more details, visit the following link: <http://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp>). The Likert scales of the indicators, except those from V25 to V35 (WVS, 2015), have been reversed so that larger values of all the variables in this study reflect greater preferences.

TABLE 1 AROUND HERE

Regarding the methodology, data from the WVS are first used in a confirmatory factor analysis carried out with a structural equation model in order to test the scales that measure SC and PVs. A factor analysis is useful in order to synthesize, in only a few factors, the numerous indicators that WVS data covers, many of which are also frequently correlated. The factor analysis applied is confirmatory instead of exploratory because those factors which summarize the numerous indicators that WVS data covers are based on a previous theory regarding SC and PVs recognized in the literature, as pointed

out in the theoretical framework. In addition, the structural equation model enables the structure of the data set to be tested in the form of different dimensions of a wider factor, such as a part of the socio-cultural context, which includes SC and PVs. In this way, the empirical analysis is stricter and more systematic. Those dimensions or factors that are covered by the analysis have been previously defined and measured in other studies, which use the data and scales that the World Values Survey provides (Dakhli & De Clerq, 2004; Doh & Acs, 2009; Davis & Williamson, 2016; Beugelsdijk & Klasing, 2016). Once the equation model with those dimensions (factors) has been tested, they are used as independent variables together with the country income level in two regression analyses to test the hypotheses of the research (see Table 2). The regression specification model is the following:

$$Y_i = \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_6 X_{6i} + \beta_7 D_i + U_i; \quad E(U_i) = 0$$

where Y_i represents the dependent variable (National Innovation), β_1, \dots, β_6 are the coefficients of the explanatory variables (X_1, \dots, X_6), which represent the factors used in the analysis (see Table 2), and β_7 is the coefficient of a dichotomous variable which takes value 1 when country i presents a low level of income, and 0 otherwise.

In relation to the regressions, the first regression includes only the independent variables that refer to SC and PVs obtained in the structural equation analysis, whereas the second regression also includes the country income level as one of the independent variables and the interaction effect between the country income level and the SC and PV variables. The country income level is represented by a dichotomous variable that takes value 1 for low-income countries (National Income *per capita* < \$6000), and 0 otherwise.

The use of a binary variable for the income level of the countries allows the effect of the country's income level on innovation to be seen clearly and facilitates the capture and interpretation of those interaction effects between the level of income and the socio-cultural variables in which this study is interested according to the aforementioned objectives.

The introduction of interaction effects in this study make it possible to ascertain whether the slope of the regression line is different in countries that have a different level of income, that is, if the influence of the socio-cultural dimensions on a country's innovation changes due to the level of wealth of that country. It is important to highlight that previous research has hardly ever carried out that kind of study since the country income level is frequently considered as a control variable in the analysis, without taking into consideration a possible specific influence of it on the variables influencing innovation, that is, an indirect effect that moderates the final effect of the variables on innovation.

The study of the regression shows a good linear fit, and no problems of collinearity are indicated between the variables according to the values of Variance Inflation Factor and condition index (the highest value is approximately 4). Table 2 shows the variables used in the regression analysis and in Cronbach's alpha of the constructs used in the study.

TABLE 2 AROUND HERE

3.2 Empirical analysis and findings

The confirmatory factor analysis concerning the socio-cultural factors was performed in a structural equation model with SPSS Amos Graphics, using the asymptotic

method since the scales of the indexes associated to the factors do not always present normality. The size of the sample meets the requirements for using that method (Mulaik, 2009: 166). Cronbach's Alpha is used to test the scale reliability of the items associated to each of the six socio-cultural factors: institutional trust, generalized trust, social networks, civic norms, self-transcendence/conservation, and self-enhancement/openness to change (Table 2). Due to the fact that the WVS 2010-2014 only covers a shortened version of the Schwartz Value Inventory, the eleven items related to PVs that cover the survey have been grouped into only two dimensions in order to assure the reliability of the two PV constructs. These eleven items that form these constructs can be considered as summarizing two fundamental polarities: *self-enhancement vs. self-transcendence* and *conservation vs. openness to change* (Held *et al.*, 2009).

TABLE 3 AROUND HERE

The results of the structural equation models lead to the removal of some of the items initially included in the analysis (see the footnote of Table 3) due to the following facts: they are not statistically significant, they present a low factor loading, they present a high level of correlation with other variables that remain in the analysis, and the inclusion of the items reduce Cronbach's Alpha below 0.7. Table 3 summarizes the process of the search for the model with the best fit, and shows the measures of fit that have been chosen for this study. Since there are no precise rules for the assessment of the model fit, various measures, according to the recommendations by Kline (2005) and Boomsma (2000), were selected. In addition, a measure of parsimony is presented: the PNFI index (Hooper *et al.*, 2008). Model 1 is the first model to be explored, and covers 41 items and 6 factors, while Models 2 and 3 are those that present the best fits. As can be observed, the first model is far from a good fit, the second model in Table 3 is almost

acceptable and covers the 6 initial factors, and the third is the only model that presents an acceptable fit. Figure 2 shows a representation of Model 3, which presents the best fit.

Specifically, Model 3 is composed of five dimensions: on the one hand, it has the four dimensions of SC, that is, generalized trust, institutional trust, networks and civic norms; on the other hand, only one of the two dimensions of PVs is included, that is, self-transcendence/conservation. The use of a much shortened version of the Schwartz inventory of items covered by the WVS 2010-2014 may provide the reason why the fit of the model improves when the items that form self-enhancement/openness to change are removed. These items and those forming the self-transcendence/conservation dimension present a certain level of correlation to each other.

FIGURE 2 AROUND HERE

As mentioned earlier, the second step of the analysis consists of a regression analysis in which the dependent variable is the national level of innovation and the independent variables are both the dimensions (factors) resulting in the structural equation model and the country income level. In this way, two models were estimated (Table 4). The first relates the dependent variable and the six socio-cultural factors covered in this study, that is, those in the second structural equation model, which presents an almost acceptable fit (Table 3). This first regression with six independent factors is used to test only the first six hypotheses without taking into consideration both the effect of the country income level and the interaction effect. Results show that hypotheses H2, H4, and H5 are supported, and H1, H3, and H6 are not supported. These findings only slightly differ from the results of other previous studies that focus on dimensions of SC and PVs to explain innovation (Dhakli & De Clerq, 2004; Doh & Acs, 2009; Kaasa, 2009; Williams & McGuire, 2010; Dollinger *et al.*, 2007; Taylor & Wilson,

2012; Lebedeva *et al.*, 2013). The second regression model (Table 4) presents several differences with respect to the first model. One is that it does not cover the “self-enhancement/openness to change” factor because this regression model is based on the third model of structural equations, that is, on the only model that presents a clear acceptable fit. Note that “self-enhancement/openness to change” also failed to present any statistical significance in the previous regression. Another notable difference is that the second regression model covers two new independent variables: the country income level and another variable showing the interaction effect between the country income level and self-transcendence/conservation. The reason why only this interaction effect has been considered in the regression is the result of a previous analysis using the generalized linear model that showed that only that interaction effect is statistically significant among all the possible interaction effects to be considered (Appendix 3).

Results of this second regression model (Table 4) shows the following variables (dimensions) as statistically significant: self-transcendence/conservation, the country income level and the interaction variable between the country income level and self-transcendence/conservation. As can be observed, the interaction variable shows a positive sign, while the self-transcendence/conservation dimension presents a negative sign and a higher coefficient. This means that the negative effect of the self-transcendence/conservation dimension on innovation is moderated, that is, it is lower in countries that have a low or middle level of income. Therefore, according to regression Model III, only H5 and H7 are fully supported, and H8 is partially supported. Table 5 offers a summary on the results of the formulated hypothesis.

TABLE 4 AROUND HERE

TABLE 5 AROUND HERE

4. Conclusions, implications and limitations

According to Institutional Economics, certain socio-cultural factors exert their influence on the levels of national innovation. In this article, SC and PVs have been specifically considered. On the one hand, SC was identified, following Putnam (1993), with four dimensions in accordance with their structural or cognitive nature: social networks (structural nature), generalized trust, institutional trust, and civic norms (cognitive nature). On the other hand, PVs were identified, following Schwartz (2012), with two dimensions: self-transcendence/conservation and self-enhancement/openness to change.

The contribution of this study is the analysis of the influence of SC and PVs on national innovation under a comprehensive approach that not only considers these two socio-cultural factors together, but also the country income level as an independent and moderating variable between SC and PVs with national innovation. In this respect, we have striven to verify whether the effects of SC and PVs on innovation differ in low-income countries in comparison to other more highly developed countries. To this end, the World Value Survey (WVS) offers the possibility of carrying out this type of analysis since it includes items for the measurement of those socio-cultural factors in its questionnaire. Furthermore, the use of a confirmatory factor analysis carried out with a structural equation model has allowed us to specify, in a more rigorous way, the dimensions of the SC and PVs included in the analysis regarding their influence on national innovation.

According to the obtained results, we attain the following findings. Firstly, PVs of *self-transcendence/conservation* appear as the only socio-cultural factor among those selected in this study that influences national innovation, and this influence is negative. This means that in the countries where the concern for welfare and interests of others predominate, and also where the order, self-restrictions, preservation of the past, and resistance to change are commonly emphasized, the level of national innovation decreases. Neither SC dimensions nor other PVs have a significant impact. Secondly, as expected, the country income level exerts an influence on the levels of national innovation, since the level of innovation is lower in low-income countries than in the rest. Finally, the last finding is that the negative effect of the PV of *self-transcendence/conservation* on national innovation is less strong in those low-income countries.

Therefore, these findings lead us to present two major conclusions that contribute to the literature. On the one hand, the superior influence of PVs in comparison to SC on the levels of national innovation and, on the other hand, the lower sensitivity of national innovation in low-income countries in comparison to middle and high income countries regarding a more conservative and benevolent/universalist culture. These conclusions are discussed in greater detail below.

Firstly, the conclusion that states that the influence of PVs on national innovation is superior than that of SC is in line with the findings of studies that confirm that values and beliefs are profoundly settled within the social systems and are continuously reinforced (Pasimeni, 2007; Pinillos & Reyes, 2011). Values shape the individual's cognitive schemes and, consequently, programme behavioural patterns (Hofstede, 2003; Liñán *et al.*, 2013). More specifically, the fact that the PV of self-

transcendence/conservation constitutes the clearest significant factor on national innovation is in line with those studies that find that territories with a higher resistance to change and more concern for general interest are less inclined to innovate (Williams & McGuire, 2010; Dollinger *et al.*, 2007; Taylor & Wilson, 2012; Lebedeva *et al.*, 2013).

Furthermore, the first conclusion leads us also to agree with those studies that point out that the relationship between SC and national innovation remains unclear because of their contradictory results (Dhakli & De Clerq, 2004; Doh & Acs, 2009; Kaasa, 2009). Since this paper includes the country income level in the analysis, the result would be in line with the idea that suggests that SC does not necessarily positively affect innovation in all countries when both the existence and the level of development of a national innovation system are taken into consideration (Pasimeni, 2007). This means that, when an innovation-oriented system exists, the presence of strong SC would reinforce the innovative trend through higher levels of cooperation or the improved sharing of knowledge. However, when an innovation system does not exist or does not function, which is very usual in low-income countries, strong SC would hinder the promotion of change because it would encourage maintaining the status quo.

Secondly, the second conclusion, which states that the level of national innovation in low-income countries is less sensitive to a more conservative culture or a more benevolent/universalist culture, suggest that advances in innovation don't deteriorate so much in low-income countries in the face of values contrary to new ideas and changes as it would happen in middle and high income countries. It is true that a conservative culture, because of its lower tolerance and higher resistance to change, can halt the attraction of talent, obstruct knowledge spillovers and establish new barriers to entering the markets in any country, independently of its income level (Quian, 2013; Rosberger and Krauser,

2012). Furthermore, by bearing in mind that we live in a globalized world where there is freedom of movement of resources, it seems logical that negative environmental conditions, which inhibit innovation -and conservative personal values are key to shaping those conditions-, can boost the outflow of capital and other material and human resources to other countries, with the resulting decrease in the levels of national innovation, However, in low-income countries, when changes in environmental conditions take place and the level of self-transcendence/conservation values increases, the effect on innovation is lower than in richer countries since the level of innovation is already very low and their innovation systems are neither developed. In other words, the conservative values do not have where project their negative effects in these countries, and, therefore, their damage on national innovation is not so high.

Additionally, the lower sensitivity of national innovation in low-income countries to the PV of self-transcendence/conservation can be related with the proportion of public and private expenditures in the level of R&D. These proportions vary widely between richer and poorer countries. Whereas in richer countries the largest percentage of R&D expenditure is financed by private firms, in poorer countries the public sector frequently assumes the greatest proportion. Private expenditure is more dependent on environmental conditions and, therefore, if that environment changed towards a situation less favourable to innovation because of a change in values, then the national levels of innovation would weaken. In contrast, the higher contribution of the state to R&D expenditures in low-income countries makes a decrease in the levels of national innovations less likely due to the lower dependency of this kind of expenditure on market conditions.

Finally, this study involves certain limitations. Regarding the data and methodology, we assume that the list of indicators (items in the questionnaire) covered

by the World Values Survey 2010-2014 fails to capture all the different aspects of SC and PVs. Specifically, this list only considers a shortened list of Schwartz's items, and excludes any other possible value that could affect innovation. Furthermore, the empirical analysis in this study has assumed the concepts of SC and PVs used by the WVS, which do not always coincide with those concepts defined by other sources or authors. Finally, the present research is a cross-sectional analysis instead of a longitudinal analysis. This limits the results of the study, which, in turn, could also limit its robustness.

Nevertheless, these limitations also suggest opportunities for future research. Specifically, a subsequent step could be the use of a wider range of years, and the inclusion of new data in the analysis, both from different waves of the WVS and also from other data sources. In this respect, it would be possible to verify whether the results hitherto obtained continue to hold over time, and across various countries. These steps are planned to be developed in upcoming investigations.

References

- Acs, Z., & Audretsch, D. (2005). Entrepreneurship, innovation, and technological Change. *Foundations and Trends in Entrepreneurship, 15*, 1-65.
- Acs, Z., Autio, E. & Szerb, L. (2014). National systems of entrepreneurship: Measurement issues and policy implications. *Research Policy, 433*, 476-494.
- Acs, Z., & Szerb, L. (2011). *The Global Entrepreneurship and Development Index 2012*. Cheltenham: Edward Elgar Publishers.

- Alexashin, Y., & Blenkinsopp, J. (2005). Changes in Russian managerial values: a test of the convergence hypothesis? *The International Journal of Human Resource Management*, 163, 427-444.
- Audretsch, D., & Thurik, R. (2001). Whats New about the New Economy? Sources of Growth in the Managed and Entrepreneurial Economies. *Industrial and Corporate Change*, 10 (1), 267-315.
- Barata, J. M., & Fontainha, E. (2017). Determinants of innovation in European construction firms. *Technological and Economic Development of Economy*, 23(6), 915-936.
- Baumol, W. J. (1968). Entrepreneurship in Economic Theory. *The American Economic Review*, 582, 64-71.
- Beugelsdijk, S., Klasing, M. J., (2016). Diversity and trust: The role of shared values. *Journal of Comparative Economics*, 44(3), 522-540.
- Bilsky, W., Gollan, T., Roccas, S., Grad, H., Mendes, M.L., Rodriguez, M., Schweiger Gallo, I., & Segal-Caspi, L. (2015). On the relative importance of personal values. Validating Schwartzs theory of value structures by computerized paired comparisons. *Journal of Individual Differences*, 362, 119-129.
- Bilsky, W., Janik, M., & Schwartz, S. H. (2011). The structural organization of human values – Evidence from three rounds of the European Social Survey ESS. *Journal of Cross-Cultural Psychology*, 42, 759-776.
- Bjørnskov, C., & Méon, P.G. (2015). The Productivity of Trust. *World Development*, 70, 317-331.

- Boomsma, A. (2000). Reporting Analyses of Covariance Structures. *Structural Equation Modeling*, 7 (3), 461-83.
- Bourdieu, P. (1986). The forms of capital. In: Richardson, J. (ed)., *Handbook of Theory and Research for the Sociology of Education*. New York: Greenwood.
- Camps, S., & Marques, P. (2014). Exploring how social capital facilitates innovation: The role of innovation enablers. *Technological Forecasting and Social Change*, 88, 325-348.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, S95-S120.
- Crescenzi, R., Gagliardi, L., & Percoco, M. (2013). Social capital and the innovative performance of Italian provinces. *Environment and Planning A*, 45(4), 908-929.
- Cummings, S., Seferiadis, A. A., Maas, J., Bunders, J. F., & Zweckhorst, M. B. (2018). Knowledge, Social Capital, and Grassroots Development: Insights from Rural Bangladesh. *The Journal of Development Studies*, 1-16.
- Daghfous, A. (2006). Absorptive capacity and innovative enterprise systems: a two-level framework. *International Journal of Innovation and Learning*, 4(1), 60-73.
- DAgostino, L. M., & Moreno, R. (2017). Exploration during turbulent times: an analysis of the relation between cooperation in innovation activities and radical innovation performance during the economic crisis, *Industrial and Corporate Change*, dtx035, <https://doi.org/10.1093/icc/dtx035>.
- Dakhli, M., & De Clercq, D. (2004). Human capital, social capital, and innovation: a multi-country study. *Entrepreneurship and Regional Development*, 16(2), 107-128.

- Dasgupta, P. (2012). National Wealth. *Population and Development Review*, 38, 243-264.
- Davidsson, P., & Honig, B. (2004). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18, 301-331.
- Davis, L. S., & Williamson, C. R. (2016). Culture and the regulation of entry. *Journal of Comparative Economics*, 44 (4), 1055-1083.
- Dinesen, P. T., Nørgaard, A. S., & Klemmensen, R. (2014). The civic personality: Personality and democratic citizenship. *Political Studies*, 62, 134-152.
- Dobewall, H., & Strack, M. (2014). Relationship of Ingleharts and Schwartzs value dimensions revisited. *International Journal of Psychology*, 494, 240-248.
- Doh, S., & Acs, Z. J. (2009). Innovation and Social Capital: A Cross-country Investigation, *Jena Economic Research Papers*, 2009-082, Friedrich Schiller University and the Max Planck Institute of Economics.
- Dollinger, S. J., Burke, P. A., & Gump, N. W. (2007). Creativity and values. *Creativity Research Journal*, 192(3), 91-103.
- Doloreux, D., Shearmur, R., & Rodriguez, M. (2016). Determinants of R&D in knowledge-intensive business services firms. *Economics of Innovation and New Technology*, 25(4), 391-405.
- Dovey, K. (2009). The role of trust in innovation. *The Learning Organization*, 164, 311-325.
- Dutta, S., Bruno, L., & Wunsch-Vincent, S. (2015). The Global Innovation Index 2015: Effective Innovation Policies for Development. *WIPO*.

- Efrat, K. (2014). The direct and indirect impact of culture on innovation. *Technovation*, 34(1), 12-20.
- European Social Survey 2012, 2014. *ESS Resources*. Available at <http://www.europeansocialsurvey.org/essresources/>
- Fagerberg, J., Srholec, M., & Versbagen, B. (2009). *Innovation and Economic Development*. Working Paper No. 2009-032. UNUMerit.
- Filip, F. G., Ciurea, C., Dragomirescu, H., & Ivan, I. (2015). Cultural heritage and modern information and communication technologies. *Technological and Economic Development of Economy*, 21(3), 441-459.
- Fontaine, J. R. J., Poortinga, Y. H., Delbeke, L., & Schwartz, S. H. (2008). Structural equivalence of the values domain across cultures: Distinguishing sampling fluctuations from meaningful variation. *Journal of Cross-Cultural Psychology*, 39, 345–365.
- Glew, D. J. (2009). Personal values and performance in teams: and individual and team-level analysis. *Small Group Research*, 40(6), 670-693.
- Granovetter, M. (1983). The strength of weak ties: a network theory revisited. *Sociological Theory*, 1, 201-233.
- Granovetter, M. (1985). Economic action and social structure: the problem of embeddedness. *The American Journal of Sociology*, 91 (3), 481-510.
- Grootaert, C., & Bastelaer, T. V. (2001). Understanding and Measuring Social Capital: Social Capital Initiative Working Paper. 24. *World Bank*.

- Grootaert, C. (2001). Social Capital: The missing link. In Uslaner, E. (Ed.), *Social capital and participation in everyday life*. London: Routledge.
- Gundelach, B., & Traunmüller, R. (2014). Beyond generalised trust: Norms of reciprocity as an alternative form of social capital in an assimilationist integration regime. *Political Studies*, 623, 596-617.
- Gundlach, G. T., Achrol, R. S., & Mentzer, J. T. (1995). The structure of commitment in exchange. *The Journal of Marketing*, 59(1), 78-92.
- Guo, C. (2015). Cultural Convergence, Divergence, and Crossvergence. *Wiley Encyclopedia of Management*, 6, 1-2.
- Hanel, P. H., & Wolfradt, U. (2016). The dark side of personal values: Relations to clinical constructs and their implications, *Personality and Individual Differences*, 97, 140-145.
- Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review*, 1064, 766-794.
- Held, M., Mueller, J., Deutsch, F., & Welzel, C. (2009). Value Structure and Dimensions. Empirical Evidence from the German World Values Survey. *World Values Research*, 23, 55-76.
- Herbig, P., & Dunphy, S. (1998). Culture and innovation. *Cross Cultural Management: An International Journal*, 54, 13-21.
- Herdin, T., & Aschauer, W. (2013). Value changes in transforming China, *Kome: An International Journal of Pure Communication Inquiry*, 21, 1-22.

- Hofstede, G. H. (2001). *Cultures Consequences: Comparing values, behaviors, institutions, and organizations across nations*. Beverly Hills: Sage Publications.
- Hofstede, G. H. (2003). *Cultures consequences: comparing values, behaviors, institutions and organizations across nations*. Newbury Park: Sage Publications.
- Hooper, D., Coughlan, J., Mullen, M. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business Research Method*, 61, 53-60.
- Inglehart, R. (1971). Changing value priorities and European integration. *Journal of Common Market Studies*, 101, 1-36.
- Inglehart, R. (1997). *Modernization and postmodernization*. Princeton, NJ: Princeton University Press.
- Inglehart, R. (2007). Mapping global values, in Esmer, Y., Pettersson, T. (Eds.), *Measuring and mapping cultures: 25 years of comparative value surveys*. Leiden: Brill.
- Inglehart, R., Baker, W. (2000). Modernization, Cultural Change, and the Persistence of Traditional Values. *American Sociological Review*, 65, 19-51.
- Ivančič, A., Podmenik, D., & Hafner, A. (2014). Independent inventors, social capital, and knowledge transfer—the case of Slovenia. *Innovation: The European Journal of Social Science Research*, 27(3), 238-253.
- Jiang, L., & O'Neill, B. C. (2018). Determinants of Urban Growth during Demographic and Mobility Transitions: Evidence from India, Mexico, and the US. *Population and Development Review*. Available at: <https://doi.org/10.1111/padr.12150>

- Kaasa, A. (2009). Effects of different dimensions of social capital on innovative activity: Evidence from Europe at the regional level. *Technovation*, 29(3), 218-233.
- Kaasa, A., & Vadi, M. (2010). How does culture contribute to innovation? Evidence from European countries. *Economics of innovation and new technology*, 19(7), 583-604.
- Kirikkaleli, D., Ozun, A., & Sari, A. (2018). How can policy makers foster innovation? Observations from an analysis of OECD countries. *Innovation: The European Journal of Social Science Research*, 1-14.
- Kirmanoglu, H., & Baslevent, C. (2012). Using basic personal values to test theories of union membership, *Socioeconomic Review*, 10(4), 683-703.
- Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press.
- Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly journal of economics*, 112(5), 1251-1288.
- Knafo, A., Roccas, S., & Sagiv, L. (2011). The value of values in cross-cultural research: A special issue in honor of Shalom Schwartz. *Journal of cross-cultural psychology*, 42(2), 178-185.
- Kouvo, A. (2011). The sources of generalized trust and institutional confidence in Europe. *Research on Finnish Society*, 4, 29-40.
- Landes, D. (2006). Why Europe and the West? Why not China? *Journal of Economic Perspectives*, 20(2), 3-22.

- Landry, R., Amara, N., & Lamari, M. (2002). Does Social Capital Determine Innovation? To What Extent? *Technological Forecasting and Social Change*, 69, 681-70.
- Laursen, K., Masciaelli, F., & Prencipe, A. (2012). Regions matter: How localized social capital affect: Innovation and external knowledge acquisition. *Organization Science*, 23(1), 177-193.
- Lebedeva, N., Osipova, E., & Cherkasova, L. (2013). *Values and social capital as predictors*. SEARCH Working Paper No. 5/09.
- Leonard, M. (2004). Bonding and bridging social capital: Reflections from Belfast. *Sociology*, 38(5), 927-944.
- Lin, N. (2003). *Social capital, a theory of social structure and action*. Cambridge: Cambridge University Press.
- Liñán, F., Fernández, J., & Romero, I. (2013). Necessity and opportunity entrepreneurship: The mediating effect of culture. *Revista de Economía Mundial*, 33, 27–51.
- Liñán, F., & Fernandez-Serrano, J. (2014). National culture, entrepreneurship and economic development: different patterns across the European Union. *Small Business Economics*, 42(4), 685-701.
- Liñán, F., & Santos, F. J. (2007). Does social capital affect entrepreneurial intentions?. *International Advances in Economic Research*, 13(4), 443-453.
- Maillat, D. (1988). La revitalisation des régions de tradition industrielle: le rôle des PME et du milieu. *Revue Internationale PME*, 1, 1, 7-22.

- Mansfield, E. (1984). Comment on Using Linked Patent and R&D Data to Measure Interindustry Technology Flows, in Griliches, Z. (Ed.), *R&D, Patents, and Productivity*. Chicago: University of Chicago Press.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological review*, 982, 224.
- Matvejeva, A. (2014). Determinants of persistence in innovation: evidence from the case study of the 'Eye Microsurgery'Complex. *Economics of Innovation and New Technology*, 23(5-6), 544-562.
- McCrae, R. R., Costa Jr, P. T., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M. D., Sanz, J., Sánchez-Bernardos, M. L., Kusdil, M. E. , Woodfield, R., Saunders, P. R., & Smith, P. B. (2000). Nature over nurture: temperament, personality, and life span development. *Journal of personality and social psychology*, 781, 173-186.
- Mulaik, S. A. (2009). *Linear Causal Modeling with Structural Equations*. Chapman and Hall/CRC: Taylor and Francis Group.
- Murphy, J. T. (2002). Networks, Trust, and Innovation in Tanzanias Manufacturing Sector. *World Development*, 30 (4), 591-619.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of management review*, 23(2), 242-266.
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.

- OECD (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd Edition. EUROSTAT & OCDE (Eds). Available at <http://www.oecd.org/sti/inno/oslomanualguidelinesforcollectingandinterpretinginnovationdata3rdedition.htm>
- Pasimeni, P. (2007). Social capital, culture and innovation: a different perspective. In Landabaso, M., Kuklinski, A., Román, C. (Eds.), *Europe: reflections on social capital, innovation and regional development: the Ostuni consensus*. Nowy Sacz: Wyzsza Szokola Biznesu/ National Louis University.
- Peters, H. P., Lang, J. T., Sawicka, M., & Hallman, W. K. (2007). Culture and technological innovation: Impact of institutional trust and appreciation of nature on attitudes towards food biotechnology in the USA and Germany. *International Journal of Public Opinion Research*, 192, 191-220.
- Pinillos, M.J., & Reyes, L. (2011). Relationship between individualist–collectivist culture and entrepreneurial activity: evidence from Global Entrepreneurship Monitor data. *Small Business Economics*, 37(1), 23–37.
- Piore, M. J., & Sabel, C. F. (1984). *The second industrial divide: possibilities for prosperity*. New York: Basic books.
- Porter, M. E., Sachs, J. D., & McArthur, J. W. (2002). Executive Summary: Competitiveness and Stages of Economic Development, in Porter, M. E., Sachs, J. D., Cornelius, P. K., McArthur, J. W. and Schwab, K. (Eds.), *The Global Competitiveness Report 2001–2002*. New York: Oxford University Press.
- Portes, A. (1998). Social Capital: its Origins and Applications in Modern Sociology. *Annual Review of Sociology*, 24 (1), 1-24.

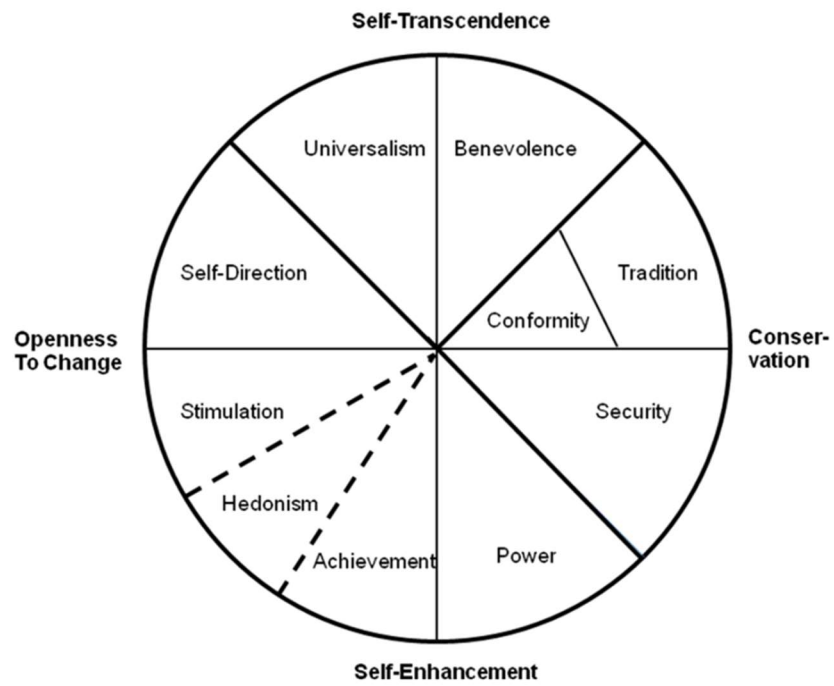
- Putnam, R. D. (1993). *Making Democracy Work. Civic traditions in modern Italy*. Princeton, NJ: Princeton University Press.
- Putnam, R. D. (2000). *Bowling Alone. The collapse and revival of American community*. New York: Simon and Schuster.
- Qian, H. (2013). Diversity versus tolerance: The social drivers of innovation and entrepreneurship in US cities. *Urban Studies*, 50(13), 2718-2735.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Rossberger, R. J., & Krause, D. E. (2012). National Culture, Heterogeneity and Innovation New Insights into the Relationship between the GLOBE Dimensions and National Level Innovation. *GSTF Journal of Law and Social Sciences (JLSS)*, 2(1). 84-89.
- Rostow, W. W. (1960). *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge: Cambridge University Press.
- Rubalcaba, L., Aboal, D., & Garda, P. (2016). Service innovation in developing economies: Evidence from Latin America and the Caribbean. *The Journal of Development Studies*, 52(5), 607-626.
- Sagiv, L. (2002). Vocational interests and basic values. *Journal of Career Assessment*, 10, 233–257.
- Schøtt, T., & Jensen, K. W. (2016). Firms innovation benefiting from networking and institutional support: A global analysis of national and firm effects. *Research Policy*, 456, 1233-1246.

- Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Brunswick: Transaction publishers.
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advance and empirical tests in 20 countries. *Advances in Experimental Social Psychology*, 25, 1-65.
- Schwartz, S. H. (1994). Are there universal aspects in the content and structure of values? *Journal of Social Issues*, 50, 19-45.
- Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online readings in Psychology and Culture*, 2(1), 11.
- Schwartz, S. H., & Bardi, A. (1997). Influences of adaptation to communist rule on value priorities in Eastern Europe. *Political psychology*, 182, 385-410.
- Shane, S. A. (1992). Why do some societies invent more than others? *Journal of Business Venturing*, 71, 29-46.
- Shane, S. A. (1993). Cultural influences on national rates of innovation. *Journal of Business Venturing*, 81, 59-73.
- Stöhr, W. B. (1986). Regional innovation complexes. *Papers in Regional Science*, 591, 29-44.
- Taylor, M. Z., & Wilson, S. (2012). Does culture still matter?: The effects of individualism on national innovation rates. *Journal of Business Venturing*, 272, 234-247.

- Tigabu, A. D., Berkhout, F., & Van Beukering, P. (2015). Technology innovation systems and technology diffusion: Adoption of bio-digestion in an emerging innovation system in Rwanda. *Technological Forecasting and Social Change*, 90, 318-330.
- Tura, T., & Harmaakorpi, V. (2005). Social Capital in Building Regional Innovative Capability. *Regional Studies*, 39, 1111-1126.
- Uphoff, N. (2000). Understanding social capital: learning from the analysis and experience of participation. In Dasgupta, P., Serageldin, I. (Eds.), *Social capital: A multifaceted perspective*. Washington: World Bank.
- Uslaner, E. M. (2008). The foundations of trust: macro and micro. *Cambridge journal of economics*, 322, 289-294.
- Vasilaky, K. N., & Leonard. K. L. (2016). As Good as the Networks They Keep?: Improving Outcomes through Weak Ties in Rural Uganda. *Economic Development and Cultural Change*.
- Waarts, E., & Van Everdingen, Y. (2005). The Influence of National Culture on the Adoption Status of Innovations: An Empirical Study of Firms across Europe. *European Management Journal*, 236, 601-610.
- Wennekers, S., Van Wennekers, A., Thurik, R., & Reynolds, P. (2005). Nascent entrepreneurship and the level of economic development. *Small business economics*, 243, 293-309.
- Williams, L. K., & McGuire, S. J. (2010). Economic creativity and innovation implementation: the entrepreneurial drivers of growth? Evidence from 63 countries. *Small Business Economics*, 344, 391-412.

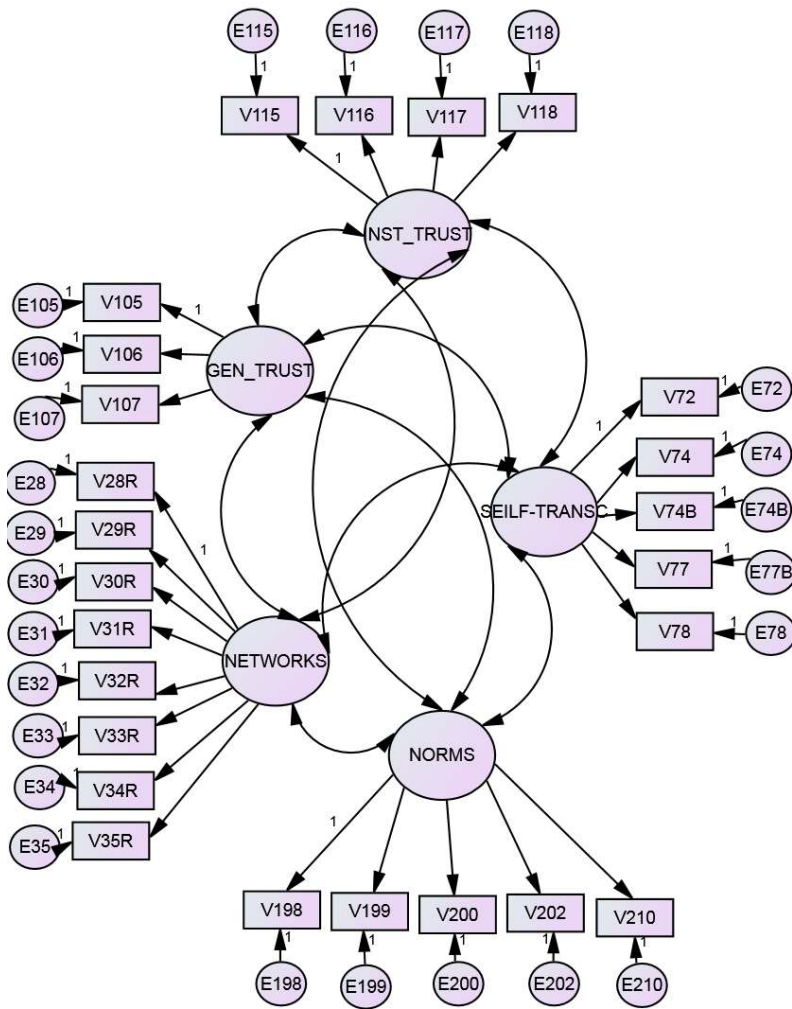
- Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and society*, 27(2), 151-208.
- Woolcock, M., & Narayan, D. (2000). Social capital: Implications for development theory, research, and policy. *The world bank research observer*, 15(2), 225-249.
- Wolfe, D. A., & Nelles, J. (2008). The role of civic capital and civic associations in cluster policy. In Karlsson, C. (Ed.), *Handbook of research on innovation and clusters: cases and policies*. Cheltenham: Edward Elgar Publishing Inc.
- WVS (2013, 2014), *World Values Survey Publications*. Available at <http://www.worldvaluessurvey.org/WVSContents.jsp>
- WVS (2015), *World Values Survey Data analysis tool*. Available at <http://www.worldvaluessurvey.org/WVSONline.jsp>
- Yang, K. P., Chou, C., & Chiu, Y.J. (2014). How unlearning affects radical innovation: The dynamics of social capital and slack resources. *Technological Forecasting and Social Change*, 87, 152-163.
- Yan, L., & Yan, J. (2013). Leadership, organizational citizenship behavior, and innovation in small business: an empirical study. *Journal of Small Business and Entrepreneurship*, 26(2), 183-199.

Figure 1. Theoretical model of relations among ten motivational types of values



Source: Schwartz (1992, p. 45)

Figure 2. Structural equation model of socio-cultural factors. Model 3



Source: Own elaboration

Table 1. Items of the WVS 2010-2014 used for the representation of the socio-cultural factors

Socio-cultural factors	Constructs	Indicators (Values: Items)
Social Capital	Institutional trust	V112, V114, V115, V116, V117, V118, V119, V120, V121
	Generalized Trust	V103, V104, V105, V106, V107
	Social Networks	V25, V26, V27, V28, V29, V30, V31, V32, V33, V34, V35
	Norms	V198, V199, V200, V201 V202, V210
Personal Values	Self-Transcendence /Conservation	V72, V74, V74B, V77, V78, V79
	Self- Enhancement/ Openness to Change	V70, V71, V73, V75, V76

Source: World Values Survey (2015)

Table 2. Variables used in the regression analysis

Kind of variable	Variable	Cronbach's alpha	Indicators	Source
Dependent	National innovation		Research and Development as a % of GDP	WBG
Independent	Non-high-income country		Gross National Income p.c.	
Independent	Networks	0,833	Factors obtained from structural equation model	WVS 2010-2014
Independent	Generalized trust	0.734		
Independent	Institutional trust	0.882		
Independent	Norms	0.850		
Independent	Self-transcendence /conservation	0,805		
Independent	Self-enhancement/ Openness to change	0,700		

Table 3. Structural Equation Models tested

Model	Number of Items*	Number of factors	Fit indexes
1	41	6	RMSEA: 0.030; CFI: 0.666; PNFI: 0.618
2	30	6	RMSEA: 0.028; CFI: 0.826; PNFI: 0.739
3	25	5	RMSEA: 0.022; CFI: 0.907; PNFI: 0.800

* Items removed: V70, V71, V73, V75, V112, V114, V120, V121, V192, V193, V197, V201, V76, V222, V223, V224.

Table 4. Results of the Regression Analysis

Independent Variables	Model I		Model II	
	St.coef.	S.D.	St.coef.	S.D.
Constant		(0.109)**		(0.204)**
Institutional Trust	-0.040	(0.283)	-0.010	(0.276)
Generalized Trust	0.251	(0.346)*	0.159	(0.414)
Networks	0.076	(0.343)	0.025	(0.364)
Norms	0.271	(0.360)*	0.108	(0.370)
Self-transcendence/conservation	-0.557	(0.386)**	-0.747	(0.391)**
Self-enhancement/openness	-0.05	(0.388)	-	-
Low_income.	-	-	-0.261	(0.295)**
Self-transcendence/ conservation*Low_income	-	-	0.437	(0.589)**
F-Value	8.432	**	8.707	**
Adjusted R ²	0.487		0.534	
Number of variables	6		7	

Note: *P< 0.05, **P<0.01

Table 5. Summary of hypothesis' results

Variables	Hipotesis	Results
SOCIAL CAPITAL	H1: A positive relationship between the engagement of people in civic associations and innovation exists: the higher the level of engagement in civic associations the higher the level of national innovation.	Not supported
	H2: A positive relationship between generalized trust and innovation exists: the higher the level of generalized trust the higher the level of national innovation.	Not supported
	H3: A positive relationship between institutional trust and innovation exists: the higher the level of institutional trust, the higher the level of national innovation.	Not supported
	H4: A positive relationship between social norms and innovation exists: the higher the level of commitment to civic behaviour, the higher the level of national innovation.	Not supported
PERSONAL VALUES	H5: A negative relationship between conservation and self-transcendence and innovation exists: the higher the level of conservation and self-transcendence, the lower the level of national innovation.	Supported
	H6: A positive relationship between openness to change and self-enhancement on the one hand, and innovation on the other hand, exists: the higher the level of openness to change and self-enhancement, the higher the level of national innovation.	Not supported
COUNTRY INCOME LEVEL (DIRECT AND MODERATING EFFECT)	H7: A positive relationship between the country income level and innovation exists: the lower/higher the level of the country income level, the lower/higher the level of national innovation.	Supported
	H8: The country income level moderates the effects that SC and PVs have on innovation.	Partially supported

APPENDIX 1. Summary of Literature Review: Main Contributions about the Influence of Social Capital, Personal Values and National Income on Innovation

Variables	Contribution	Main results obtained
Social Capital (SC)	Portes, 1998	Social ties can facilitate access to resources but they can also restrict individual freedoms and bar outsiders from gaining access to the same resources through particularistic preferences.
	Woolcock, 1998	SC is a complex concept that varies depending on the level of socio-economic development and it can have a negative effect on both innovation and economic growth if it is not present in all their forms (social ties in micro and macro levels).
	Murphy, 2002	Social networks of businesspeople support innovation in firms. Trust in these relations plays an important role as it improves the quality of information exchanges and encourages the development of strong ties.
	Dhakli & De Clerq, 2004	Partial support is found for the positive effect of trust and associational activity on innovation and negative relationship between norms of civic behaviour and innovation.
	Pasimeni, 2007	In an innovation-oriented system, the presence of SC reinforces the trend, but when an innovation system does not exist or does not function, strong social capital will reinforce this tendency, making it more and more difficult to promote change in such a context.
	Peters <i>et al.</i> , 2007	The higher relevance of trust in institutions makes cultures more apt to assimilate technical innovations.
	Doh & Acs, 2009	There is a positive relationship between SC (consisting of generalized and institutional trust, associational activities and civic norms) and innovation at the national level. SC interacts with entrepreneurship and the strongest relationship is between associated activities and entrepreneurship.
	Dovey, 2009	Trust and other key social capital resources are essential within and beyond the organization networks for the collective generation of new ideas.
	Laursen <i>et al.</i> , 2012	Trust (cognitive SC) has no impact on the innovation decision-making process. Participation in associations, meetings, and business networks (structural SC) influence the likelihood of innovation, but not its radicalness. Relational assets (structural) influence both the decision to innovate and the degree of the radicalness.
	Crescenzi <i>et al.</i> , 2013	Participation in civic association is an important predictor of innovative performance, which suggests that social norms may play an important role in shaping the incentives for knowledge generation, circulation, and accumulation.
	Yan & Yan, 2013	Among the three organizational citizenship behaviours (Sportsmanship leadership, Relationship leadership, and civic virtue), only civic virtue was found to have a significant and positive relationship with innovation.
Ivančič <i>et al.</i> , 2014	Inventors are supported by their ties with civil society organizations as well as their family and friends. Professional and interdisciplinary linkages are not a priority, complicating their access to relevant knowledge and information.	

APPENDIX 2
Countries and Number of Interviews in the Analysis

Country	N	%	Country	N	%
Algeria	1200	1,4	Malaysia	1300	1,5
Azerbaijan	1002	1,2	Mexico	2000	2,3
Argentina	1030	1,2	Morocco	1200	1,4
Australia	1477	1,7	Netherlands	1902	2,2
Bahrain	1200	1,4	New Zealand	841	1,0
Armenia	1100	1,3	Nigeria	1759	2,0
Brazil	1486	1,7	Pakistan	1200	1,4
Belarus	1535	1,8	Peru	1210	1,4
Chile	1000	1,2	Philippines	1200	1,4
China	2300	2,7	Poland	966	1,1
Taiwan	1238	1,4	Qatar	1060	1,2
Colombia	1512	1,8	Romania	1503	1,7
Cyprus	1000	1,2	Russia	2500	2,9
Ecuador	1202	1,4	Rwanda	1527	1,8
Estonia	1533	1,8	Singapore	1972	2,3
Georgia	1202	1,4	Slovenia	1069	1,2
Palestine	1000	1,2	South Africa	3531	4,1
Germany	2046	2,4	Zimbabwe	1500	1,7
Ghana	1552	1,8	Spain	1189	1,4
Hong Kong	1000	1,2	Sweden	1206	1,4
India	1581	1,8	Thailand	1200	1,4
Iraq	1200	1,4	Trinidad and Tobago	999	1,2
Japan	2443	2,8	Tunisia	1205	1,4
Kazakhstan	1500	1,7	Turkey	1605	1,9
Jordan	1200	1,4	Ukraine	1500	1,7
South Korea	1200	1,4	Egypt	1523	1,8
Kuwait	1303	1,5	United States	2232	2,6
Kyrgyzstan	1500	1,7	Uruguay	1000	1,2
Lebanon	1200	1,4	Uzbekistan	1500	1,7
Libya	2131	2,5	Yemen	1000	1,2
Total				86272	100,0

APPENDIX 3

Test of Between-Subjects Effects

Dependent variable: R&D

Origen	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	29,485 ^a	10	2,949	5,264	,000
Intersection	14,135	1	14,135	25,234	,000
INCOME_LEVEL * FAC_INST_TRUST	,297	2	,148	,265	,769
INCOME_LEVEL * FAC_SELF-TRANS	13,439	2	6,719	11,995	,000
INCOME_LEVEL * FAC_NORMS	,660	2	,330	,589	,560
INCOME_LEVEL * FAC_NETWORKS	,062	2	,031	,055	,947
INCOME_LEVEL * FAC_GEN_TRUST	3,064	2	1,532	2,735	,078
Error	20,726	37	,560		
Total	106,800	48			
Corrected total	50,211	47			

a. R Squared = ,587 (Adjusted R Squared = ,476)