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INTERNATIONAL PATENT COLLABORATION, SOCIAL CAPITAL AND ENTREPRENEURSHIP

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Abstract

Entrepreneurship is one of the most relevant sources of economic growth and for this reason has received more and more attention for scholars. In this sense, governments and industrial agents invest their scant resources to promote it. In particular, they try to generate favorable environments, thus social capital is essential to create this framework. Traditionally, studies emphasized the impact of social capital in international technological collaboration initiatives and these two on entrepreneurship. However, we consider that this impact is in other direction. Specifically, we consider the mediating effect of social capital in the relationship of international technological collaboration and entrepreneurship. In order to test our hypotheses we construct a data panel of 30 countries for the period between 2005 and 2012. Our findings confirm the partial mediation of social capital. In addition, our paper provides policy recommendations about international technological collaboration in order to increase the rate of entrepreneurship.

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Abstract:

Entrepreneurship is one of the most relevant sources of economic growth and for this reason has received more and more attention for scholars. In this sense, governments and industrial agents invest their scant resources to promote it. In particular, they try to generate favorable environments, thus social capital is essential to create this framework. Traditionally, studies emphasized the impact of social capital in international technological collaboration initiatives and these two on entrepreneurship. However, we consider that this impact is in other direction. Specifically, we consider the mediating effect of social capital in the relationship of international technological collaboration and entrepreneurship. In order to test our hypotheses we construct a data panel of 30 countries for the period between 2005 and 2012. Our findings confirm the partial mediation of social capital. In addition, our paper provides policy recommendations about international technological collaboration in order to increase the rate of entrepreneurship.

Key words:

Entrepreneurship; Social capital, Patent; International collaboration

1. INTRODUCTION

Entrepreneurship is essential to generate social, technological and economic growth (Acs, 2006; Acs and Varga, 2005; Audretsch and Acs, 1994; Romer, 1986). Nowadays, governments and industrial agents are worried about the low levels of entrepreneurship and they invest a lot of resources in order to promote it (Bishop and Thompson, 1992; Eschenbach and Hoekman, 2006; Lo, 2009). However, their resources are scare and they have to select those alternatives that contribute more efficiently to increase entrepreneurship (North, 2005). They know that generate good environmental conditions, that favor confidence, alliances and collaborations between agents is essential to increase the rates of entrepreneurship.

International technological collaboration is a driving force of entrepreneurship (Alvarez and Barney, 2001; Hoekman et al., 2005; Ireland et al., 2006). Previous studies have explored the relationship between patents and innovation with entrepreneurship (Havrylyshyn, 2001; Kaufmann et al., 2006; Nyström, 2008). In the same way, there are also many studies that analyze the influence of alliances and collaboration on entrepreneurship (Alvarez and Barney, 2005; Belderbos et al. 2014; Ireland et al., 2006). These authors argue that collaborations in innovation and patents (one of the most frequently) have relevant impact on country economic growth. In addition, nowadays, industrial agents establish collaborations with partners around the world and therefore the frontiers of knowledge are disappearing. In this sense, more and more agents around the world collaborate in order to: (I) obtain new patents and new knowledge, (II) increase sales, and (III) detect to business opportunities (Dubini and Aldrich, 1991; Kirzner, 1997; Shane and Venkataraman, 2000; Soh, 2003; Wiewel and Hunter, 1985).

On the other hand, whereas it has been traditionally emphasized the impact of social capital in international technological collaboration initiatives (Yli-Renko et al. 2001), scholars have started acknowledging that they can also have implications in the other direction. In this way, these international technological collaborations contribute to generate more social capital (Thai and Turkina, 2014), especially when it is obtained output with this collaboration (e.g. new patents). Thus, countries invest more and more resources in international technological collaboration. These investments (in international technological collaborations) increase knowledge flow between countries and generate more favorable environment that favor the level of social capital and affect to entrepreneurial activity (Alvarez et al., 2006; Burt, 1992; Dickson et al., 2006 Estrin et al., 2013a).

We contribute to previous literature on two main aspects. Firstly, we aim to demonstrate that international patent collaboration (at country level) has important implications on entrepreneurship. Secondly, we analyze the influence of international patent collaboration in social capital. Previous studies argue that one society generates social capital with different ties and networks at individual, organizational and country level (Etemad and Lee, 2003; Greve and Salaff, 2003; Tan and Tan, 2002). In this way, we believe that are enough indications about the effect of international patent collaboration to increase social capital at country level. There are no international empirical studies in this sense and we aim to filling this gap in the literature.

This paper is structured as follows. First, we introduce insights provided by existing literature on the relationship between international technological collaboration and entrepreneurship. Second, we analyze in depth the mediating effect of social capital in the relationship of international technological collaboration and entrepreneurship. Building on these ideas, we then develop our research hypotheses. In the next sections, we describe the research methodology, and present and discuss our findings. Finally, we provide the main conclusions, implications, and limitations of this paper and suggest promising avenues for future work.

2. THEORETICAL FRAMEWORK

2.1. International patent collaboration and entrepreneurship

Nowadays, more and more countries invest resources in international collaborations in order to obtain new knowledge, improve economic and technological growth, increase quality of life and increase entrepreneurship (Alvarez et al., 2006; Belderbos et al., 2014; Giuliani et al., 2016; Hamel, 1991; Inkpen, 2008; Leiblein & Reuer, 2004; Montobbio & Sterzi, 2013; Nepelski and De Prato, 2015). International technological collaboration (i.e. agreements between agents in different countries aimed to jointly develop technological innovation), focused on R&D and patent, are one of the most frequent collaborations. Many authors argue that all types of innovations are relevant for entrepreneurship because increase productivity, contribute to society' progress and for economic growth and thus facilitates entrepreneurial process (Cohen, 2010; Hall et al. 2014). In addition, innovations developed by international collaboration provide extra value because it facilitates technology transfer and knowledge spillovers (implicit and explicit knowledge), allows to obtaining different and new

knowledge, establish long-term relationships, and facilitates new agreements in others matters (Acs et al., 2008; Grimaldi et al., 2011; Plummer and Acs, 2014; Terjesen and Wang, 2013).

On the one hand, ever since the early work of Schumpeter, the concepts of 'entrepreneurship' and 'innovation' have been strongly related. Innovation allows firms to discover technological opportunities that are essential to entrepreneurship. In this way, opportunity discovery depends increasingly upon the information in the market and especially in the era of globalization, from the interaction between market participants (Hayek, 1945; Kirzner, 1997). International collaboration provides an extra value than national or regional collaboration because the scope is larger and allows connecting with more and different agents. Previous studies of entrepreneurship and technological innovation emphasize that entrepreneurial opportunities are created in the process of technological innovation because of the exchange of knowledge between different agents (Roberts, 1988; Utterback, 1994). *"If* entrepreneurs discover information about these opportunities, they will capitalize upon the opportunities because the new combination *of assets will result in profits"* (Soh, 2003: 730). In addition, there are indications to think that if two or more partners obtained a patent as a result of international collaboration, they can continue working together in the future and create more intensive ties that can materialize in new firms.

On the other hand, the knowledge obtained from these international patent collaborations is essential to favor entrepreneurship because it provides the advantages of innovation output and also the advantages of collaborate with foreign agents. In this way, there are a lot of national and international programs that promote international patent collaboration and entrepreneurship. These initiatives include technology-based economic development such as the Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Science Enterprise Challenge, the "Law on Innovation and Research to Promote the Creation of Innovative Technology Companies" (Mustar and Wright, 2010), and ProTon Europe, the European Knowledge Transfer Association (European Commission). Therefore, international patent collaboration are direct ties that contribute significantly to the exchange of resources and information between partnering agents (e.g., Arora and Gambardella, 1990; Barley et al., 1992; Eisenhardt and Schoonhoven, 1996; Hamel, 1991; Larson, 1992; Shan, 1990). According to Soh (2003) one individual may learn and discover opportunities from innovations developed by international collaboration and afterwards creates its own firm. On the basis of the above arguments, we formulate the following hypothesis:

H2. At country level, international patent collaboration is positively related to entrepreneurship

2.2. Social capital and entrepreneurship

In recent years and from different perspectives, attention has been drawn to the influence that certain activities of a social nature exert on economic activities (Akcomak y ter Weel, 2009; Barro, 1996; Baumol, 2002; Dearmon y Grier, 2009; Fukuyama, 1995; Guiso et al., 2004; North, 2005; Putnam, 2000). The concept of social capital refers to the social networks and norms of reciprocity associated with them (Putnam 2000: 9). Social activities, springing from stable relationships maintained by individuals, groups and organisations in society are usually identified with the concept of social capital (Bourdieu 1986; Coleman 1988, 1990; Putnam et al. 1993; Putnam 2000). The use of the term social capital has become widespread (Casson and Giusta 2007) and is used to describe in a unified way all assets that facilitate social relationships and economic exchanges (Grootaert and Basteart 2002).

Social capital has been studied at multiple levels, including the individual (Burt, 1992), organisational (Nahapiet and Ghoshal 1998), and societal (Putnam 1993; Serageldin and Dasgupta 2001). The central proposition in the social capital literature is that networks of relationships constitute, or lead to, resources that can be used for the good of the individual or the collective. First, at the individual level, social capital has been defined as the resources embedded in relationships with others. The emphasis in this case is on the actual or potential benefits that accrue from one's network of formal and informal ties with others (Burt 1992). In the resource-based view, a firm is seen as a pool of resources, including vital intangible resources, which can create competitive advantage and superior profits (Barney 1986a, 1986b; 1991; Penrose 1959; Rumelt 1984; Wernerfelt 1984). Second, at the organisational level, social capital has been defined as the value to an organisation of the relationships formed by its members for the purpose of engaging in collective action (Freel 2000; Nahapiet and Ghoshal 1998). Third, the role of social capital has also been examined on a more macro-level in terms of its impact on the well-being of regions or societies (Bourdieu 1986; Coleman 1990; Putnam 1993). The institutional view argues that social capital is actually a material outcome or dependent variable derived from constraining or facilitating institutional environments (Svendsen and Svendsen 2003).

However, entrepreneurship researchers have overlooked the question of whether and how social capital at the societal level encourages entrepreneurial activities in a region. This is

unfortunate since there is growing evidence that social networks of individual entrepreneurs are embedded in the broader societal context (e.g. Dodd and Patra 2002: Kwon and Arenius 2010; Staber and Aldrich 1995). Recently, Scholars have argued that a more integrative understanding of entrepreneurship, which combines individual (e.g., psychological, personality, and demographic characteristics) with environmental perspectives (e.g., sociological, economic, institutional, temporal), is needed to fully advance entrepreneurship as an independent field of study (e.g. Baker, Gedajlovic, & Lubatkin, 2005; McMullen & Shepherd, 2006; Murphy, Liao, &Welsch, 2006; Sarason, Dean, & Dillard, 2006; Zahra & Wright, 2011). Toward this end, scholars have begun to recognize and articulate the idea that entrepreneurs and entrepreneurship are socially situated (Gedajlovic et al., 2013).

If social capital influences the economic development of a country significantly, it seems reasonable to expect it to also have some influence on a country's entrepreneurial activities (Schumpeter 1942). However, social capital research has not adequately addressed this causal link at the national level and, instead, tends to focus on a micro perspective at the individual level. There is a growing literature suggesting that social capital at the regional/country level is positively associated with investment and growth at the regional/country level. Knack and Keefer (1997), for example, show that an increase of one standard deviation in country level of trust predicts an increase in economic growth of more than one-half of a standard deviation for a sample of 29 countries. Using a bigger sample of 41 countries, Zak and Knack (2001) show that, controlling for other influences, national growth rises by nearly 1% for each 15 percentage points increase in trust. La Porta et al. (1997) also find that, holding per capita GNP constant, an increase in trust raises large firms' share of the economy for a sample of 40 countries. Finally, using a sample of 36 countries, Kwon y Arenius (2010) found that a resident of a country with higher generalized trust and breadth of formal organizational memberships was more likely to perceive entrepreneurial opportunities. A resident of a country with higher generalized trust was also more likely to invest in an entrepreneur with whom he or she had a weak personal tie than was a resident of a country with lesser generalized trust.

In general it has been observed that individuals living together in environments where there are high levels of social capital are more likely, or find it easier, to develop in all types of social fields, such as the workplace, daily life or the economy and, therefore, will show active attitudes when setting up new firms (Lee 2009).On the basis of the above arguments, we formulate the following hypothesis:

H2. At country level, social capital is positively related to entrepreneurship

2.3. Social capital as a mediator between international patent collaboration and entrepreneurship

Social networks such as technology-based collaboration network or science-based co-authorship reflect the social interactions among a set of agents –individuals, teams, organizations or even countries (Cantner and Rake, 2014; Knoben et al., 2006; Li et al., 2013; Zaheer and Soda, 2009; Guan and Liu, 2016). These interactions serve as social capital and represent the flowing and searching channel of knowledge and information (Adler and Kwon, 2002; Gonzalez-Brambila et al., 2013; Moran, 2005). These relationships also represent a lens through which social actors can evaluate each other and their knowledge stocks (Phelps et al., 2012; Guan and Liu, 2016).

In a particular social context, individuals acquire social capital through deliberate actions and can take advantage of it to obtain economic returns. The extension of social capital at a collective level among many individuals has important social implications. Social capital built up over a geographical area, and based on different relationships, alliances and collaborations, and it may provide benefits for the whole population. As we previously mentioned and according to Austrian economics perspective of entrepreneurship, a change in existing resources exploited under previous entrepreneurial activities will create windows of new opportunities (Kirzner, 1997). Industrial agents will obtain the information about these opportunities by mutual interaction with other market participants (Hayek, 1945). Networking is an activity by which entrepreneurs obtain potential information about untapped opportunities (Dubini and Aldrich, 1991) and new firms discover new resources that are not known to existing organizations (Wiewel and Hunter, 1985). Nowadays, firms and agents collaborated with other agents around the world; if these collaborations are or not successful they will contribute to generate more social capital.

In this way, previous literature suggests that international technological collaborations contribute to generate more social capital (Thai and Turkina, 2014), especially when it is obtained output with this collaboration (e.g. new patents). The new patents contribute to increase the knowledge and technology development and it provides new business opportunities. Thus, countries invest more and more resources in international technological collaboration. These investments (in international technological collaborations) increase knowledge flow between countries and generate more favorable environment that favor the

level of social capital and affect to entrepreneurial activity (Alvarez et al., 2006; Burt, 1992; Dickson et al., 2006 Estrin et al., 2013a).

In sum, international technological collaborations leads to social capital and social capital can stimulate or hamper entrepreneurship. These two effects together determine the mediating role of social capital in the international collaborations-entrepreneurship relationship. This is laid down in hypothesis H3.

H3. At country level, social capital mediates the relationship between patent collaboration and entrepreneurship.

3. RESEARCH DESIGN

3.1. Sample

We analyzed data from five databases. First, the database elaborated by OECD, "Main Science and Technology Indicators". This database is especially recommended for this analysis because its mission is to promote policies that will improve the economic growth of people around the world. Moreover, it provides accurate and detailed information about international patent collaboration. Second, we collected information from the database of GEM (Global Entrepreneurship Monitor; http://www.gemconsortium.org/). GEM project is one of the most relevant world databases in the field of entrepreneurship as evidenced by previous studies (Estrin et al. 2013b; Davidsson 2015; Kwon and Arenius, 2010). Third, we also collected information of the World Economic Forum. This organization committed to improving the state of the world, is one of the most important International Organization for Public-Private Cooperation. Fourth, we consider the Corruption Perceptions Index elaborated by International Transparency in line with previous studies (Acs et al., 2014; Aidis et al., 2008). Finally, we collected data from SAIKA project (Intellectual Capital as a Driver of Nacional Economy) in Finland Futures Research Centre at University of Turku, and funded by the Finnish Funding Agency for Technology and Innovation (TEKES). The SAIKA porject collect data from various public databases, (e.g. EUROSTAT, UN, IMF, WB, OECD, WTO and ILO), and construct indicators with these data.

Our database contains information about 30 countries: Australia, Belgium, Brazil, Canada, China, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Norway, Portugal, Russia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, The Netherlands, Turkey, UK, USA. We restricted our sample to

countries with information for four consecutively years. The data contain annual records of Total Entrepreneurial Activity (TEA) by country, and include data collected about international patent collaboration and social capital. Our data collected information about these countries between 2005 and 2012. The final data contained 197 country-year observations.

3.2. Measurement of variables

Dependent variable (TEA)

Entrepreneurship is the dependent variable used in this study. We measure these variables as TEA (Total Entrepreneurial Activity) constructed by GEM Project. This indicator includes individuals in the process of starting a venture and those running a new business less than 3 ½ years old (as a percentage of the adult population (18-64 years old)). Thus, we understand entrepreneurship as all entrepreneurial activities (social and commercial activities), including self-employment if this entrepreneur has a portion of capital. In this study, we analyze the behavior of this variable for the period between 2005-2012. This measure is consistent with the pattern of intentions to start a venture, and it is widely accepted in the previous literature (Aparicio et al., 2015; Urbano & Alvarez, 2014).

Independent variable (Patent collaboration)

This variable collects the proportional part of patents developed in collaborations with two or more countries that belong to one country. In particular, this variable represents the international patent collaboration in the inventive process (Co-patents). In this case, this type of collaboration not always implies mobility and the property are shared. We obtained the data of this type of patents from Patent Co-operation Treaty (PCT), at international phase that designate the European Patent Office (EPO) (from 1978 onwards). In particular, the database is "Main Science and Technology Indicators" by OECD. In order to analyze the influence of this variable on social development, we include in our model the percentage of patents with foreign co-inventor "COPAT". In particular, we analyze this variable for the period between 2005-2012. Previous literature shows the importance of this variable (Nepelski and De Prato, 2015; Belderbos et al., 2014; Giuliani et al., 2016; Montobbio & Sterzi, 2013).

Mediator variable (Social capital)

Previous literature show that social capital influences on entrepreneurship rates (Dodd and Patra 2002: Kwon and Arenius 2010; Ng et al., 2015). According to these papers and in order to demonstrate our relationship, we use the same indicator. Specifically, the indicator

included is the measure of "Trustworthiness and confidence" collected in "Global Competitiveness Report" elaborated by World Economic Forum for the period between 2005 to 2012.

Control variables

Analyses at country level usually consider the influence of other variables related with the institutional framework. In particular, we analyze the influence of other technological collaborations (Patents in Host countries and Patents in home countries). In addition, nowadays, many papers analyze the influence of the level of corruption on entrepreneurship. On the one hand, some studies point out that the level of corruption influence positively on entrepreneurship (The effect of grease the wheels). On the other hand, most of literature argues that the level of corruption harms entrepreneurship. Moreover, we also analyze the influence of venture capital, thus more and more firms and entrepreneurs try to finance their projects with these funds. Therefore venture capital show easily available for business.

Patents in Host Countries (PHOST)

Nowadays, the increasing global mobility of researchers makes it necessary to analyze worldwide cooperation in depth. In particular, this type of patent reflects the international flows of knowledge from the inventor country to the applicant countries and international flows of funds for research. Specifically, we are interesting in the patents invented by national researchers in foreign countries. We employed the variable "Domestic ownership of inventions made abroad" defined such as: "number of patents owned by resident(s) of country x (applicant) that have been invented by at least one foreign resident (inventor) from country" (OECD, 2015). Finally, in order to add this variable on our model we include the percentage of patents invented abroad: share of indicator above in total patents owned by resident(s) of country x (applicant). We obtained the data of this type of patents from Patent Co-operation Treaty (PCT), at international phase that designate the EPO (from 1978 onwards). In particular, the database is "Main Science and Technology Indicators" by OECD. This variable has been used by previous studies (Guellec & van Pottelsberghe de la Potterie,Bruno, 2001; Montobbio & Sterzi, 2013).

Patents in Home countries (PHOME)

Patents in Home countries. This variable is defined by OECD "Foreign ownership of domestic inventions: number of patents invented by resident(s) of country x (inventor) that

are owned by at least one foreign resident (applicant) from country" (OECD, 2015). In particular, we included the percentage of patents owned by foreign residents: share of indicator above in total patents invented by resident(s) of country x (inventor). We obtained the data of this type of patents from Patent Co-operation Treaty (PCT), at international phase that designate the EPO (from 1978 onwards). In particular, the database is "Main Science and Technology Indicators" by OECD. This variable has been used by previous studies (Guellec & van Pottelsberghe de la Potterie, Bruno, 2001; Montobbio & Sterzi, 2013).

Corruption

Previous literature show the necessity of control by level of corruption by country because the rate of corruption that also varying by country (Anokhin & Schulze, 2009). Sometimes, corruption level facilitates entrepreneurship but it usually complicates the creation of new firms (De Vaal & Ebben, 2011). In this sense, previous literature shows three indicators of corruption (Indicator of corruption proposed by international transparency, the indicator of World Bank, and the indicator of World Economic Forum) (Judge et al., 2011). Finally, we decided to use the most used indicator of these three, the indicator proposes by International Transparency. This indicator measured the control of corruption by country (in a scale 0 to 100). In particular, the Corruption Perception Index was constructed from other variables and indicators in order to measure the public corruption. In order to measure it, they interview different experts and firms. Specifically, we collected data for the period between 2005-2012 by country and year.

Venture capital

Venture capital is especially important for entrepreneurship in early-stage, emerging and growth companies with novel and high technology, such as biotechnology. In particular, venture capital is a measure the easily available for business. Specifically, we measured the availability of venture capital support company development. This indicator is constructed for the project SAIKA (Intellectual Capital as a Driver of National Economy), we collected data for the period between 2005-2012 by country and year (Edvinsson and Line, 2011).

3.3. Estimation method

In order to analyze the influence on entrepreneurship, we relate the different variables (Patents collaborations and Social capital). Panel data estimations seem to be the most suitable method of capturing the variations over time in the entrepreneurship rate, since they allow us to control for country, country-specific heterogeneity, as well as for temporal

changes in the countries' operating environment (Giuliani et al., 2016; Montobbio & Sterzi, 2013). This methodology allow us to reduce potential problems caused by the possible correlation between non-observable countries' characteristics and the individual variables, by mitigating the unobservable heterogeneity that sample countries could present (Hausman & Taylor, 1981). Unobservable heterogeneity might result in spurious correlations with the dependent variable, which would bias the coefficients obtained.

As is customary in panel data analyses, we estimate both fixed effects and random effects models. The fixed effects specification assumes that company-specific effects are fixed parameters to be estimated, whereas the random effects model assumes that companies constitute a random sample. To identify which model is preferable we run the Hausman test to determine whether the unobservable heterogeneity is correlated with the explanatory variables (Hausman, 1978), which in turn implies that coefficients estimated by fixed-effects estimator and those estimated by random effects estimator do not statistically differ. If the Hausman test is significant we focus on the fixed effects model, whereas we stress the random effect model if the test turns out to be no significant. Additionally, we have corrected the estimations for heteroscedasticity and autocorrelation problems.

However, in recent years, the academic community has cast on consideration of the significance of the coefficients following the steps by Baron and Kenny (1986), and considering that it is necessary to take into account changes in the coefficients to prove the existence of a possible significant mediating effect (Holmbeck, 1997). For this purpose, it should be shown that the two coefficients are different from zero or a single test should be applied to their product (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). In this study, the hierarchical regression analysis was complemented by the Sobel Z test (1982), undoubtedly the most widely used test for determining whether the difference between the total effect and the direct effect, that is, the indirect or mediating effect, is statistically significant.

Another technique that is being increasingly used to test whether there is a mediation effect and to determine its significance is bootstrapping (Shrout & Bolger, 2002; Zhao, Lynch, & Chen, 2010). This is a non-parametric resampling method that calculates the indirect effect in each sample generated and offers a confidence interval so that, if zero is not found in this interval, it can be affirmed that the indirect effect is different from zero. These confidence intervals are superior to the Sobel Z test, because the assumption made by the latter on the

method of sampling distribution of the indirect effect is unrealistic. Bootstrapping is therefore the most rigorous and powerful technique for confirming the possible existence of a mediating effect (Hayes, 2009; Preacher & Hayes, 2008). We lost one observation per country in our analyses because we consider the variation in social development between two years.

Before estimating the model proposed and in order to detect any problems of multicollinearity t, a variance inflation factor (VIF) analysis was performed. According to the empirical rule of (Kleinbaum et al., 2013), there were apparently no such problems because in no case was the VIF greater than 10. Table 1 provides descriptive statistics on sample means and table 2 correlations for all the variables included in our study.

Insert Table 1

Insert Table 2

4. RESULTS

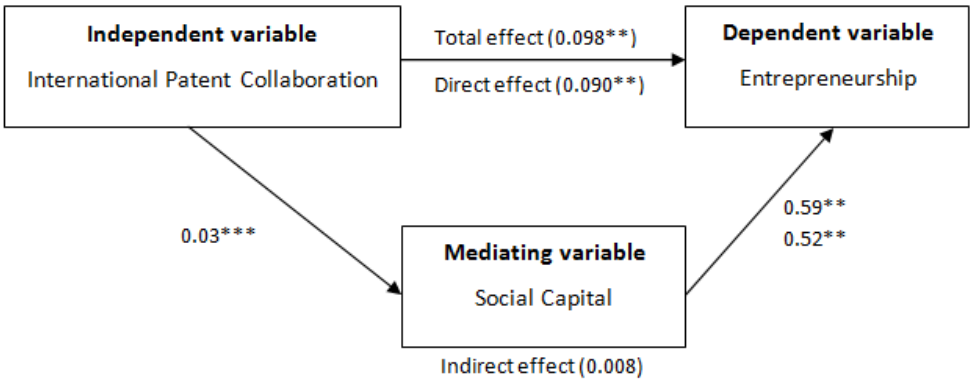
Table 3 shows the results of the hierarchical regression analysis after applying the steps by Baron and Kenny (1986). In the first step, which is shown in Model 1, after considering the four control variables and the independent variable, the results indicate that international patent collaboration has a positive and statistically significant effect on entrepreneurship rates ($\beta = 0.098$, $p < 0.05$). Both the sign of the coefficient and the level of significance support Hypothesis 1a, thus meeting the first condition for there to be a mediating effect.

Insert Table 3

In the second step, in addition to the control variables, the independent variable –international patent collaboration – was introduced to explain the mediator variable - social capital -. As shown in Model 2, the coefficient of the independent variable was also positive and significant ($\beta = 0.03$, $p < 0.01$), thus meeting the second condition for the existence of mediation. In the third step a regression was performed, with Social Capital as explanatory variable of Entrepreneurship, in addition to the control variables (Model 3). In this case, the coefficient of the Social Capital variable was positive and significant ($\beta = 0.59$, $p < 0.05$), indicating that Social Capital exert a favourable influence on entrepreneurship. Finally, in the fourth step a final regression was performed, with International patent collaborations as explanatory variable and with social capital as mediator variable, in addition to the control variables (Model 4). In this case, the coefficient of the variable International Patent

collaborations was positive and significant (β = 0.09, p < 0.05). Also, we confirmed the positive and significant relationship between social capital and entrepreneurship (β = 0.52, p < 0.05). The fact that these coefficients were statistically significant, in principle supports the existence of the mediating effect proposed in Hypothesis 2 and, more specifically, there is a partial mediation because the independent variable is significant when considered together with the mediator variable.

Figure 1. Mediating effect of Social Capital



Notes: The numerical values are for the standard regression coefficients. The values given between brackets are the coefficients after inclusion of the mediation variable in the regression equation.*p < 0.10; **p < 0.05; ***p < 0.01.

Regarding the control variables, venture capital seems to have a positive and significant effect on entrepreneurship (Models 1, 3 and 4). Also, we found a positive and significant relationship between patents invented in host country and entrepreneurship, but only in one model (Model 3). Conversely, corruption and patent invented in home seem to have a positive and significant effect on social capital but we cannot confirm their relationship with entrepreneurship (Model 2).

To test the robustness of the result regarding the mediating effect of the Social capital in the relation between International Patent collaboration and Entrepreneurship, any variations in the coefficients must also be taken into account. The total effect of International Patent collaboration on Entrepreneurship, as represented by its coefficient in Model 1 (β = 0.098), leads to a direct effect quantified by its coefficient in Model 4 (β = 0.090), so that the indirect effect would be the difference between the two, that is 0.008. The Sobel Z test corroborated that this indirect effect is statistically significant (Z = 2.82; p < 0.01).

Finally, the results obtained from bootstrapping (Table 4), after applying the Preacher and Hayes (2008) STATA and including the control variables and 100 samples, reflect a positive indirect effect of 0.089 based on the non-standard regression coefficients, with the confidence interval oscillating at 95% level between 0.0098 and 0.1681. Therefore, since 0 is not included in this interval, it can be affirmed that the mediating effect of Social Capital is significant, and Hypothesis 2 is thus confirmed. In summary, as with the results of the hierarchical regression following the Baron and Kenny (1986) steps, the two robustness analyses support the idea that Social Capital mediates in the positive relation between International Patent Collaboration and Entrepreneurship.

Insert Table 4

5. CONCLUSIONS

Entrepreneurship is essential for country development. In this way, previous literature has analyzed this phenomenon from different perspectives such as environmental and individual conditions, the process and procedures to create a firm, or the impact on society. All of these authors are agreeing to point out that the concepts of 'entrepreneurship' and 'innovation' is strongly related and it cannot consider separately. Moreover, the recent growth of international patents collaborations due to globalization, and their effects has attracted the attention of many scholars (Belderbos et al., 2014; Fu et al., 2011; Giuliani et al., 2016; Guan & Chen, 2012; Montobbio & Sterzi, 2013; Noailly & Ryfisch, 2015). As we showed in the theoretical part and we confirmed empirically, there is a positive relationship between technological innovation endeavors such as international patent collaboration and entrepreneurship.

In particular, our findings point out the capacity of countries (our sample included developing and developed countries) to appropriate the advantages of international collaboration. As Giuliani et al. 2016 argue *"countries show outstanding capacity to int*ernationalize production activities, and to invest abroad to acquire knowledge and other strategic assets *not available in their home countries"* (Giuliani et al., 2016: 200). Moreover, the structural capital of countries favors the integration and interaction with foreign agents in the focal country (or national agents in foreign countries) and therefore it improves the entrepreneurship with this type of International technological collaboration. Notably, this structural capital it is based essentially on social capital. In particular, these types of relationships between countries are intense and relevant because it obtained patents as a result

of collaboration. We believe that these intensive relationships between industrial agents from different countries contribute to generate more and more relationships in a near future, and therefore to increase the level of social capital of the involved countries. On the other hand, these international patents collaborations sometimes it materializes on new firms because there is a previous successful relationship that provides the framework to start a new business.

Our paper contributes to the policy debate about the effects of international patents collaborations. The major presence of international patents collaborations and the economic difficulties of all countries require to an efficiency investment that really contribute to generate more entrepreneurship. In addition, the main contribution of this paper is the mediating effect of social capital in the relationship between international patent collaboration and entrepreneurship.

However, this paper has some limitations; the main limitation is that it not includes less developed countries. The international patents collaborations of these countries usually are different in developed or developing countries. In this sense, we cannot extrapolate our findings to all countries. Moreover, we know that this type of collaboration can imply mobility, but we do not know if the mobility is between developed and developed, developed and developing or developing-developing. According to our limitations we detected some future lines of research. An interesting research could focus in international patents collaboration on the less developed countries. Also, it could be important analyze in depth in the type collaboration, in type of industry, in the industrial agents implied in the collaboration (firm to firm, public sector-public sector, firm-public sector,...). These analyses can provide more specific information about the public policies in terms of international patents collaboration that really are interesting to entrepreneurship.

6. REFERENCES

Acs, Z. 2006. "How is entrepreneurship good for economic growth? Innovations: Technology, Governance". Globalization 1 (1), 97–107.

Acs, Z.J., Varga, A., 2005. "Entrepreneurship, agglomeration and technological change". Small Business Economics 24 (3), 323–345.

Acs, Z.J., Desai, S., Klapper, L.F. 2008. "What does "entrepreneurship" data really show?" Small Business Economics 31, 265–281.

Acs, Z.J., Autio, E., Szerb, L. 2014. "National Systems of Entrepreneurship: Measurement issues and policy implications". Research Policy 43(3), 476-494.

Adler, P., Kwon, S. 2002. “Social capital: prospects for a new concept”. Academy of Management Review 27, 17–40.

Aidis, R., Estrin, S., Mickiewicz. 2008. “Institutions and entrepreneurship development in Russia: A comparative perspective”. Journal of Business Venturing 23(6), 656-672

Akcomak, I.S., ter Weel, L.B. 2009. “Social capital, innovation and growth: Evidence from Europe”. European economic review 53(5), 544-567.

Alvarez, S.A., Ireland, D., Reuer, J.R. 2006. “Entrepreneurship and Strategic Alliances”. Journal of Business Venturing 21(4), 401-568.

Alvarez, S.A., Barney, J.B. 2005. How entrepreneurs organize firms under conditions of uncertainty. Journal of Management 31 (5), 776-793.

Arora, A., Gambardella, A. 1990. “Complementarities and external linkages: the strategies of the large firms in biotechnology. The Journal of Industrial Economics 38 (4), 361–379.

Audretsch, D.B., Acs, Z.J. 1994. “New firms startups, technology and macroeconomic fluctuations”. Small Business Economics 6(6), 439–449.

Baker, T., Gedajlovic, E., Lubatkin, M. 2005. “A framework for comparing entrepreneurial processes across nations”. Journal of International Business Studies 36, 492-504.

Barney, J.B. 1986a. “Strategic Factor Markets: Expectations, Luck and Business Strategy”. Management Science 32 (10), 1231–1241.

Barney, J.B. 1986b. “Organizational Culture: Can It be a Source of Sustained Competitive Advantage?”. Academy of Management Review 11 (3), 656–665.

Barney, J.B. 1991. “Firm resources and sustained competitive advantage”. Journal of Management 17, 99–120.

Barley, S.R., Freeman, J., Hybels, R. 1992. “Strategic alliances in commercial biotechnology”. In: Nohria, N., Eccles, R. (Eds.), Networks and Organizations. Harvard Business School Press, Boston, MA, pp. 311–347.

Barro, R. 1996. Getting It Right: Markets and Choices in a Free Society. Cambridge: MIT Press.

Baumol, W. 2002. The Free-Market Innovation Machine. Princeton: Princeton University Press.

Belderbos, R., Cassiman, B., Faems, D., Leten, B., Van Looy, B. 2014. “Co-ownership of intellectual property: Exploring the value-appropriation and value-creation implications of co-patenting with different partners”. Research Policy 43(5), 841-852.

Bishop, M., Thompson, D. 1992. “Regulatory reform and productivity growth in the UK's public utilities”. Applied Economics 24(11), 1181–1190.

Bourdieu, P. 1986. The Forms of Capital. In Richardson, J.G. (Eds), Handbook of Theory and Research in the Sociology of Education. Greenwald Press, New York.

Burt, R., 1992. Structural Holes: The social structure of competition. Harvard University Press, Cambridge, MA.

Cantner, U., Rake, B., 2014. “International research networks in pharmaceuticals: structure and dynamics”. Research Policy 43, 333–348.

Casson, M., Giusta, M. D. 2007. “Entrepreneurship social capital: Analysing the impact of social networks on entrepreneurial activity from a rational action perspective”. International Small Business Journal 25 (3), 220-244.

Cohen, W. M. 2010. “Fifty years of empirical studies of innovative activity and performance” in B. H. Hall., N. Rosenberg (Eds.) (pp. 129-213), Handbook of the economics of innovation

Coleman, J. 1988. “Social capital in the creation of human capital”. American Journal of Sociology 94(supplement issue), 95–120.

Coleman, J. 1990. Foundations of Social Theory. Cambridge: Harvard University Press.

Davidsson, P. 2015. “Entrepreneurial opportunities and the entrepreneurship nexus: A re-conceptualization”. Journal of Business Venturing 30(5), 674-695.

Dearmon, J., Grier, K. 2009. “Trust and development”. Journal of economic behavior & Organization 71(2), 210-220.

Dickson, P.H., Weaver, K.M., Ho, F. 2006. “Opportunism in the R&D alliances of SMES: The roles of the institutional environment and SME size”. Journal of Business Venturing 21, 487-513.

Dodd, S.D., Patra, E. 2002. “National differences in entrepreneurial networking”. Entrepreneurship and Regional Development 14 (2), 117-134.

Dubini, P., Aldrich, H. 1991. “Personal and extended networks are central to the entrepreneurial process”. Journal of Business Venturing 6, 305–313.

Eisenhardt, K., Schoonhoven, C.B. 1996. “Resource-based view of strategic alliance formation: strategic and social effects in entrepreneurial firms”. Organization Science 7, 136–150.

Eschenbach, F., Hoekman, B., 2006. “Services policy reform and economic growth in transition economies”. Review of World Economics 142 (4), 746–764.

Estrin, S., Mickiewicz, T., Stephan, U. 2013a. “Entrepreneurship, Social Capital, and Institutions: Social and commercial entrepreneurship across nations”. Entrepreneurship Theory and Practice 37(3), 479-504.

Estrin, S., Korosteleva, J., Mickiewicz, T. 2013b. Which institutions encourage entrepreneurial growth aspirations?” Journal of Business Venturing 28(4), 564-580.

Etemad, H., Lee, Y. 2003. “The knowledge network of international entrepreneurship: theory and evidence”. Small Business Economics 20 (1), 5–23.

Freel, M. 2000. “External linkages and product innovation in small manufacturing firms”. Entrepreneurship and Regional Development 12, 245-266.

Fukuyama, F. 1995. Trust: The social virtues and the creation of prosperity. Nueva York: Free Press.

Gedajlovic, E., Honig, B., Moore, C. B., Payne, G. T., Wright, M. 2013. “Social capital and entrepreneurship: A schema and research agenda”. Entrepreneurship Theory and Practice, 37(3), 455-478.

Giuliani, E., Martinelli, A., Rabellotti, R. 2016. “Is co-invention expediting technological catch up? A study of collaboration between emerging country firms and EU inventors”. World Development 77, 192-205.

Global Entrepreneurship Monitor. 2014. Global reports. Retrieved from http://www.gemconsortium.org/docs/cat/1/global-reports

Gonzalez-Brambila, C.N., Veloso, F.M., Krackhardt, D., 2013. “The impact of network embeddedness on research output”. Research Policy 42, 1555–1567.

Grimaldi, R., Kenney, M., Siegel, D., Wright, M., 2011. “30 years after Bayh–Dole: reassessing academic entrepreneurship”. Research Policy 40(8), 1045–1057.

Greve, A., Salaff, J.W. 2003. “Social networks and entrepreneurship”. Entrepreneurship: Theory and Practice 28 (1), 1–22.

Grootaert, C., Bastelaer, T. Van. 2002. Understanding and measuring social capital: A synthesis of findings and recommendation from the social capital initiative. World Bank, Washington.

Guan, J., Liu, N. 2016. “Exploitative and exploratory innovations in knowledge network and collaboration network: a patent analysis in the technological field of nano-energy”. Research Policy 45, 97-112.

Guiso, L., Sapienza, P., Zingales, L. 2004. “The Role of Social Capital in Financial Development”. American Economic Review 94 (3), 526-556.

Hall, B., Helmers, C., Rogers, M., Sena, V. 2014. “The choice between formal and informal intellectual property: A literature review”. Journal of Economic Literature 52(2), 375-423.

Hamel, G. 1991. “Competition for competence and inter-partner learning within international strategic alliances”. Strategic Management Journal 12, 83–103.

Havrylyshyn, O. 2001. “Recovery and growth in transition: a decade of evidence”. IMF Staff Papers, 48, 53–87 (Special Issue on “Transition Economies: How Much Progress?”).

Hayek, F. 1945. “The use of knowledge in society”. American Economic Review 35, 519–530.

Hills, G., Lumpkin, G.T., Singh R.P. 1997. Opportunity recognition: Perceptions and behaviors of entrepreneurs. Frontiers of entrepreneurship research, Babson College, Wellesley, 203–218.

Hoekman, B. M., Maskus, K. E., Saggi, K. 2005. “Transfer of technology to developing countries: Unilateral and multilateral policy options”. World Development 33(10), 1587-1602.

Inkpen, A.C. 2008. “Managing knowledge transfer in international alliances”. Thunderbird International Business Review 50(2), 77-90.

International Transparency. 2014. Corruption Perceptions Index. Available at: (http://www.transparency.org/research/cpi/overview). Last accessed September/20, 2014.

Ireland, R.D., Hitt, M.A., Webb, J.W. 2006. “Entrepreneurial alliances and networks” in Handbook of Strategic Alliances.

Kaufmann, D., Kraay, A., Mastruzzi, M. 2006. Governance matters V: Governance indicators for 1996–2005. World Bank, Washington, DC.

Kirzner, I. 1997. “Entrepreneurial discovery and the competitive market process: An Austrian approach”. The Journal of Economic Literature 35, 60–85.

Knack, S., Keefer P. 1997. “Does social capital have an economic payoff? A cross country investigation”. Quarterly Journal of Economics 112 (4), 1251-1288.

Knoben, J., Oerlemans, L.A., Rutten, R., 2006. “Radical changes in inter-organizational network structures: the longitudinal gap”. Technological Forecasting and Social Change 73, 390–404.

Kwon, S.W., Arenius, P. 2010. “Nations of entrepreneurs: A social capital perspective”. Journal of Business Venturing 25(3), 315-330.

La Porta, R., Lopez-de-Silanes, F., Shleifer A., Vishny R.W. 1997. Trust in Large Organizations. American Economic Review 87(2), 333-338.

Larson, A., 1992. “Network dyads in entrepreneurial settings: a study of the governance of exchange relationships”. Administrative Science Quaterly 37, 76–104.

Lee, R. 2009. “Social capital and business and management: setting a research agenda”. International Journal of Management Reviews 11 (3), 247–273.

Leiblein, M.J., Reuer, J.J. 2004. “Building a foreign sales base: the roles of capabilities and alliances for entrepreneurial firms”. Journal of Business Venturing 19, 285–307.

Li, E.Y., Liao, C.H., Yen, H.R., 2013. “Co-authorship networks and research impact: asocial capital perspective”. Research Policy 42, 1515–1530.

Lin, N. 2000. “Inequality in social capital”. Contemporary Sociology 29, 785–795.

Lin, C. Y., Edvinsson, L. (2010). National intellectual capital: A comparison of 40 countries Springer Science & Business Media.

Lo, A.W. 2009. “Regulatory reform in the wake of the financial crisis of 2007–2008”. Journal of Financial Economic Policy 1(1), 4–43.

McMullen, J.S., Shepherd, D.A. 2006. “Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur”. Academy of Management Review 31, 132–152.

Montobbio, F., Sterzi, V. 2013. “The globalization of technology in emerging markets: A gravity model on the determinants of international patent collaborations”. World Development 44, 281-299.

Moran, P., 2005. “Structural vs. relational embeddedness: social capital and managerial performance”. Strategic. Management Journal 26, 1129–1151

Murphy, P.J., Liao, J., Welsch, H.P. 2006. “A conceptual history of entrepreneurial thought”. Journal of Management History 12(1), 12-35.

Mustar, P., Wright, M. 2010. “Convergence or path dependency in policies to fosterthe creation of university spin-off firms? A comparison of France and the United Kingdom”. Journal of Technology Transfer 35(1), 42–65.

Nahapiet, J., Ghoshal, S. 1998. “Social capital, intellectual capital, and the organizational advantage”. Academy Management Review 23, 242–266.

Nepelski, D., De Patro, G. 2015. “International technology sourcing between a developing country and the rest of the world. A case study of China”. Technovation 35(January), 12-21.

North, D. 2005. Understanding the Process of Economic Change. Princeton University Press, Princeton and Oxford.

Nyström, K. 2008. “The institutions of economic freedom and entrepreneurship: Evidence from panel data”. Public Choice 136 (3/4), 269–282.

OECD. 2015. Science, technology and industry scoreboard ”Main Science and Technology Indicators” (http://www.oecd.org/sti/scoreboard.htm ed.). Paris: OCDE.

Paxton, P. 1999. “Is social capital declining in the United States? A multiple indicator assessment”. American Journal of Sociology 105(1), 88-127.

Penrose, E.T. 1959. The theory of the growth of the firm. Basil Blackwell, Oxford.

Phelps, C., Heidl, R., Wadhwa, A., 2012. “Knowledge, networks, and knowledge networks a review and research agenda”. Journal of Management 38, 1115–1166.

Plummer, L.A. Acs, Z.J. 2014. "Localized competition in the knowledge spillover theory of entrepreneurship". Journal of Business Venturing 29(1), 121-136.

Putnam, R.D. 2000. Bowling alone: The collapse and revival of American community. Nueva York: Simon and Schuster.

Putnam, R.D., Leonardi R., Nanetti, R.Y. 1993. Making democracy work: Civic traditions in modern Italy. Princeton: Princeton University Press.

Roberts, E. 1988. “What have we learned: managing invention and innovation”. Research Technology Management 31, 11–29.

Romer, P. 1986. “Increasing returns and economic growth”. Journal of Political Economy 94 (5), 1002–1037.

Rumelt, D.P. 1984. Towards a Strategic Theory of the Firm. Alternative theories of the firm. Elgar Reference Collection, International Library of Critical Writings in Economics, 154, Cheltenham, U.K. and Northampton, Mass, Elgar.

Saranson, Y., Dean, T., Dillard, J.F. 2006 “Entrepreneurship at the Nexus of Individual and Opportunity: A Structuration View”. Journal of Business Venturing 21(3), 286-305.

Schumpeter, J. 1942. Capitalism, Socialism, and Democracy. New York: Harper & Row.

Serageldin, I., Dasgupta, P. 2001. Social Capital: A multifaceted perspective. World Bank Publications.

Shan, W. 1990. “An empirical analysis of organizational strategies by entrepreneurial high-technology firms”. Strategic Management Journal 11, 129–139.

Shane, S., Venkataraman, S. 2000. “The promise of entrepreneurship as a field of research”. Academy of Management Review 25, 217–227.

Soh, P-H. 2003. “The role of networking alliances in information acquisition and its implications for new product performance”. Journal of business venturing 18: 727-744.

Staber, U., Aldrich, H.E. 1995. “Cross-national similarities in the personal networks of small business owners: A comparison of two regions in North America”. Canadian Journal of Sociology 20(4), 441-461.

Svendsen, G.L.H. Svendsen, G.T. 2003. The creation and destruction of social capital: entrepreneurship, co-operative movements and institutions. Cheltenham, UK: Edward Elgar.

Tan, W.-L., Tan, T.-M., 2002. The usefulness of networks to SMEs: the case of Singapore. 2002 USASBE Annual National Conference: An Entrepreneurial Bonanza. Reno, NV.

Terjesen, S., Wang, N. 2013. "Coase on Entrepreneurship". Small Business Economics 40(2), 173-184.

Thai, M.T.T., Turkina, E. 2012. Entrepreneurship in the informal economy: Models, approaches and prospects for economic development. Routledge, New York, NY.

Utterback, J. 1994. Mastering the dynamics of innovation. Harvard Business School Press, Boston, MA.

Wernerfelt, B. 1984. The resource-based view of the firm. Strategic Management Journal 5(2), 171–180.

Wiewel, W., Hunter, A. 1985. “The inter-organizational network as a resource: a comparative case study on organizational genesis”. Administrative Science Quaterly 30, 482–496.

Woolcock, M., Narayan, D. 2000. “Social capital: Implications for development theory”. The World Bank Research Observer 15, 225-251.

World Economic Forum. 2014. Global Competitiveness Report. Available at: (http://www.weforum.org/reports/global-competitiveness-report). Last accessed September/20, 2014.

Yang, S., Lee, H., Kurnia, S. 2009. "Social Capital in Information and Communications Technology Research: Past, Present, and Future". Communications of the Association for Information Systems 25(23).

Yli-Renko, H., Autio, E., Sapienza, H. 2001.”Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms”. Strategic Management Journal 22, 587–613.

Zaheer, A., Soda, G., 2009. Network evolution: the origins of structural holes. Administrative Science Quarterly 54, 1–31.

Zahra, S.A., Wright, M. 2011. “Entrepreneurship's Next Act”. Academy of Management Perspectives 25(4), 67-83.

Zak, P.J., Knack S. 2001. “Trust and Growth”. The Economic Journal 111, 295-331.

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
TEA	7.10	3.36	1.5	24.01
COPAT	21.89	10.53	1.91	54.76
CSOCIAL	5.21	0.82	3.02	6.92
PHOST	26.70	12.37	2.52	60.33
PHOME	21.01	16.34	1.35	67.19
CORRUPTION	6.75	2.13	2.1	9.7
VENTURECAP	5.49	1.66	2.27	9.78

Table 2: Correlation matrix

Variable	1	2	3	4	5	6	7
TEA	1						
COPAT	-0.08	1					
CSOCIAL	-0.09	0.76*	1				
PHOST	-0.10	0.69***	0.31**	1			
PHOME	-0.07	0.16***	0.01***	0.30***	1		
CORRUPTION	-0.24***	0.26***	-0.04**	0.63***	0.65***	1	
VENTURECAP	-0.03	0.05*	-0.00*	0.30***	0.63***	0.56***	1

Table 3. Main results

Variable	Model1	Model2	Model3	Model4
Dep. Variable	TEA	CSOCIAL	TEA	TEA
Indep. Variables				
COPAT	0.098**	0.03***		0.09**
	2.48	2.88		2.29
CSOCIAL			0.59**	0.52**
			2.16	1.89
PHOST	0.027	-0.01	0.04**	0.03
	1.25	-1.03	1.93	1.48
PHOME	-0.05	-0.02***	0.002	-0.05
	-1.48	-2.95	0.11	-1.48
CORRUTION	-0.26	0.24***	-0.43	-0.32
	-1.03	6.30	-1.62	-1.21
VENTURUCAP	0.52***	0.20***	0.41**	0.39**
	3.31	5.17	2.40	2.33
CONS	3.61*	2.33***	2.69	2.02
	1.82	7.93	1.27	0.94
DUMMIES YEAR	Yes	Yes	Yes	Yes
Observations	167	167	167	167
Groups	30	30	30	30
Wald Chi2	27.17***	167.56***	25.69**	32.09**
R-sq	0.19	0.24	0.17	0.21
Rho	0.86	0.25	0.86	0.87

Table 4. Bootstrapping for estimating the indirect effect on Entrepreneurship.

		Indirect effect				
					Correct CI	
	Direct effect	Effect	Z	Std.dev.	Lower	Higher
IPC	0.10***	0.089***	2.20	0.04	0.0098	0.1681

Notes: Dependent variable: Entrepreneurship; the regression coefficients are shown; *p < 0.10. Confidence interval: 95%; Resampling number: 100; CI: confidence intervals.