ENVIRONMENTAL FACTORS AND ENTREPRENEURIAL ACTIVITY IN LATIN AMERICA[*]

FACTORES DEL ENTORNO Y ACTIVIDAD EMPRENDEDORA EN AMÉRICA LATINA

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ABSTRACT

The main purpose of this paper is to analyze the influence of environmental factors on entrepreneurial activity, focusing on Latin America, and using the institutional approach as theoretical framework. Through a panel data model with information from the Global Entrepreneurship Monitor and Doing Business, we demonstrate that informal institutions, such as political stability, control of corruption and role models are related to the entrepreneurial activity. Likewise, contrary to the expected results, formal institutions, such as procedures and time for starting a new business, and business and entrepreneurial skills, do not have a significant influence on entrepreneurship in Latin American countries.

Key words: Entrepreneurship, entrepreneurial activity, institutional economics, Global Entrepreneurship Monitor (GEM), Latin America.

RESUMEN

En este trabajo se analiza la influencia de los factores del entorno sobre la actividad emprendedora, centrado especialmente en Latinoamérica y usando el enfoque institucional como marco teórico. A partir de un modelo de datos de panel y con información del Global Entrepreneurship Monitor y Doing Business, se demuestra que instituciones informales como la estabilidad política, el control de la corrupción y los modelos de referencia, están relacionadas con la actividad emprendedora. Así mismo, contrario a lo esperado, las instituciones formales como los procedimientos, el tiempo para crear una empresa y las habilidades emprendedoras, no tienen una influencia significativa sobre el emprendimiento en América Latina.

Palabras clave: emprendimiento, actividad emprendedora, teoría económica institucional, Global Entrepreneurship Monitor (GEM), América Latina.

1. Introduction

Although economic growth has been generally associated with the dynamism of large companies, from the early 1980s small and medium enterprises have been recognized as key elements of economic and social development (Audretsch & Keilbach, 2004; van Stel, Carree & Thurik, 2005; Wennekers & Thurik, 1999; Wennekers, van Stel, Thurik & Reynolds, 2005). From the above-mentioned recognition, different governmental organizations have shown particular interest in the design of policies and strategies for the promotion of entrepreneurship, and at the same time academia have become interested in this phenomenon, especially in the factors that determine entrepreneurial activity.

In this paper we use institutional economics (North, 1990, 2005) applied to the analysis of entrepreneurship as a conceptual framework. In this context, environmental or institutional factors determine entrepreneurial activity. These can be categorized as formal factors (agencies and measures of support to start-ups, procedures and costs to start a business, etc.) and informal factors (role models, attitudes towards entrepreneurship, etc.). In addition, for the operationalization of these factors, we consider the dimensions of the entrepreneurial environment proposed by Gnyawali and Fogel (1994), such as government policies and procedures, socio-economic factors, entrepreneurial and business skills, and financial and non-financial assistance.

The objective of this paper is to analyze the influence of environmental factors on entrepreneurial activity. Using a panel data model with information over the period 2004–2009 from the Global Entrepreneurship Monitor (GEM) and Doing Business (World Bank), we provide empirical evidence of the impact of institutions on entrepreneurship, focusing on Latin American countries.

According to the OECD (Daude, 2010), economic growth in Latin America was low and volatile between 1960 and 2008. Despite the fact that the period 2003-2008 presented the highest per capita GDP growth rate in Latin America in the last 50 years, this positive news had a modest impact on closing the development gap with respect to other regions. Growth during this period has clearly been higher than in similar countries, however compared with East Asia or even the high-income OECD, the performance has been good, but not enough to close the gap. Additionally, inequality in this mainly middle-income region is among the highest in the world (Paes, Ferreira, Molina & Saavedra, 2009), with the richest 10 percent of the population holding 41 percent of total income and the poorest 10 percent owning just 1 percent. Poverty reduction has stagnated, with 47 million people in the region —more than 8 percent of the population— still living in extreme poverty. Concretely, Latin America is the most unequal region in the world and the unofficial economy is larger than in most OECD countries (OCDE, 2009).

Regarding the implications of this research, from a theoretical perspective, the main results show advances in the application of the institutional approach as a conceptual framework for the analysis of entrepreneurial activity. The study also reaffirms and empirically validates the importance of environmental factors to the process of entrepreneurship. Although the number of scholars who use the institutional approach is increasing, there are not many empirical studies in the light of this theory, probably due to the difficulties related to the measurement of the variables concerning the institutional framework. The evidence found can be useful for the design of government policies on the promotion of entrepreneurial activity, according to the specificities of the different countries.

Following the introduction, this paper is structured as follows. Firstly, we analyze the relevant literature on the environmental factors and entrepreneurial activity. Secondly, the methodology used is described. Next, the results are presented and discussed, and finally the conclusions and future research are presented.

2. Conceptual framework

According to North (1990, p. 3), "institutions are the rules of the game in a society, or more formally, institutions are the constraints that shape human interaction." The main function of institutions in a society is to reduce uncertainty by establishing a stable structure for human interaction. In general terms, North (1990, 2005) attempts to explain how institutions and the institutional framework affect economic and social development. These institutions can be either formal, such as constitutions, regulations, contracts, etc., or informal, such as attitudes, values, behavioural norms, conventions, or the culture of a determined society. Formal and informal institutions are interdependent and tend to interact, thus informal institutions constrain the nature of the formal institutions and vice versa. Also, institutions are characterized by their durability, however evolve over time. Informal institutions change more slowly than formal institutions (Williamson, 2000).

Therefore, human behavior is influenced by the institutional environment (Ajzen, 1991). Concretely, in the field of entrepreneurship, both formal and informal institutions could either constrain or foster the decision to create a new business. In this context, some scholars propose the application of institutional economics for the analysis of entrepreneurship (Aidis, Estrin & Mickiewicz, 2008; Alvarez, Urbano, Coduras & Ruiz, 2011; Salimath & Cullen, 2010; Stephen, Urbano & van Hemmen, 2005, 2009; Thornton, Ribeiro-Soriano & Urbano, 2011; Veciana & Urbano, 2008; Urbano, 2006; Welter, 2005; among others).

The literature on entrepreneurship also studies the environmental conditions. Specifically, Gnyawali and Fogel (1994) propose five dimensions of the entrepreneurial environment: a) government policies and procedures, b) socio-economic factors,[1] c) entrepreneurial and business skills, d) financial assistance to business, and e) non-financial assistance.

According to these dimensions, and adapting the approach of North (1990 and 2005), government policies and procedures, entrepreneurial and business skills, and financial and non-financial assistance to businesses are related to formal institutions, while social conditions concern informal institutions.

Concerning informal factors, the World Bank measures institutions through the concept of governance, which consists of the traditions and institutions by which authority in a determined country is exercised. This includes a number of factors; the process by which governments are selected, monitored and replaced; the capacity of the government to formulate and implement sound policies effectively; and the respect of citizens and the state for the institutions that govern the economic and social interactions among them (Kaufmann, Kraay & Mastruzzi, 2008). Also, an increasing number of investigations (Anokhin & Schulze, 2009) show a positive relationship between governance and indicators of economic welfare, including per capita growth in GDP (Kaufmann & Kraay, 2003), the Human Development Index of the United Nations (Rose-Ackerman, 2004), income inequality (Li, Xu, & Zou, 2000), and entrepreneurial activity (Djankov, Qian, Roland & Zhuravskaya, 2005, 2006; Johnson, McMillan & Woodruff, 1999 and 2000; McMillan & Woodruff, 1999, 2002;). Although the relationship varies in these studies (some suggest it is positive and direct, while others affirm that it is positive, but curvilinear) (Anokhin & Schulze, 2009), a recent meta-analysis of 89 studies confirmed that governance (of which control of corruption and political stability are important components) moderates the economic indicators and therefore plays a key role in the economic development of countries and regions (Doucouliagos & Ulubasoglu, 2008; Kaufmann et al., 2008).

Comparative studies at country level show positive relationships between political stability and investment (Wohlgemuth, 2000). Multidimensional indicators of credibility of the laws, regulations, and policies, which have been linked to political stability, also show

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[1] Although Gnyawali and Fogel (1994) jointly pointed out social and economic conditions, due to the objective and the conceptual framework of this research, the economic conditions (the economic growth of the region or country, the diversity of economic activities, etc.) will not be considered.

positive relationships with private investment, entrepreneurial activity, and economic growth. Johnson, Kaufmann, McMillan and Woodruff (2002) analyzed entrepreneurship in post-communist countries, and found in contrast that extralegal payments (bribes) and the inefficiency of the courts inhibit entrepreneurial activity more than the lack of financing. Then, we deduce that corruption and political instability, as well as other deficiencies in the governance of a country, increase transaction costs while limiting the income. Therefore, control of corruption and political stability would increase the likelihood of future entrepreneurs capturing a greater share of the revenue they generate, increase the reliability of cash flows, and thus motivate higher levels of entrepreneurial activity.

Countries with less political stability and lower levels of control of corruption are in low stages of economic development and in turn have higher rates of entrepreneurship, especially self-employment and necessity entrepreneurship (people who start their own business because other employment options are either absent or unsatisfactory). As countries move forward in economic development and increase their levels of political stability and control of corruption, the entrepreneurial activity rate decreases. However, according to Wennekers et al. (2005), in developed countries with high political stability and high control of corruption entrepreneurship also increases, in particular opportunity entrepreneurship (people who start their own business taking advantage of an entrepreneurial opportunity).

Specifically, Latin American countries are characterized by high rates of unofficial economy and the entrepreneur would assume the payment of bribes and other inefficient market conditions to be a business cost. Entrepreneurs respond to market imperfections by using various gap-filling and, perhaps second-best solutions. In extreme cases, where market and non-market failures are pervasive, entrepreneurs are pushed out of the formal sector into the informal sector (Acs & Virgill, 2010).

Consequently, we propose the following hypotheses:

Hypothesis 1: Political stability has a U-shaped relationship with entrepreneurial activity.

Hypothesis 1a: Political stability has a lower influence on entrepreneurship in Latin American countries than in developed countries.

Hypothesis 2: Control of corruption has a U-shaped relationship with entrepreneurial activity.

Hypothesis 2a: Control of corruption has a lower influence on entrepreneurship in Latin American countries than in developed countries.

Another informal factor considered in this paper is role models. Role models are also very relevant institutions in the decision to start a business (Krueger, 1993; Shapero & Sokol, 1982). People who have socialized among entrepreneurs are used to perceiving a lower level of uncertainty and have more confidence in their role as entrepreneurs (Bandura, 1978) and a higher likelihood of starting a new business venture (Davidsson & Honig, 2003).

Carroll and Mosakowski (1987) asserted that children with self-employed parents are likely to have worked in the family firm at an early age and, later, started their own business. Scott and Twomey (1988) proposed that parental role models and experience lead to the perception of oneself as an entrepreneur. Scherer, Adams, Carley & Wiebe (1989) showed that a high percentage of entrepreneurs had entrepreneurial role models. Van Auken, Fry & Stephens (2006) demonstrated that many business owners include their children and other young people in their businesses and that the interaction and involvement of individuals in a business have the greatest impact on entrepreneurial intentions. Also, some of the literature that focuses on intentions (Kolvereid, 1996; Krueger, 1993; Matthews & Moser, 1995; Scherer et al., 1989; etc.) suggests that the family background affects entrepreneurial intentions. Thus, the presence of entrepreneurs with experience and successful role models transmit positive messages to potential entrepreneurs (Gnyawali & Fogel, 1994).

In Latin American countries, with high rates of unemployment and underemployment and a lower level of education of the people,

the possibility of becoming self-employed is a very attractive option. Thus, the availability of entrepreneurial role models would stimulate other members to start a business.

Therefore:

Hypothesis 3: Role models have a positive influence on entrepreneurship.

Hypothesis 3a: Role models have a higher influence on entrepreneurship in Latin American countries than in developed countries.

Regarding formal factors, Gnyawali and Fogel (1994) found that governmental regulation is generally perceived negatively by potential entrepreneurs. The literature shows that entrepreneurs may be discouraged from starting a business if they have to follow many rules and procedures (Begley, Tan & Schoch, 2005; Dana, 1990; Young & Welch, 1993). Under these assumptions, the Doing Business project of the World Bank promotes the reduction of regulation, since providing simple procedures could stimulate the creation of new businesses. For example, simplifying the formalities of registration was the most popular reform during the years 2007 and 2008, implemented in 49 countries.

However, as mentioned earlier, Latin American countries have higher rates of unofficial economy than high-income countries. In this context there is less social and legal pressure on enforcing rules and regulations. Thus, in Latin America, several formalities and procedures for starting a business are avoided by entrepreneurs.

In this way, the following hypotheses are proposed:

Hypothesis 4: Procedures for starting a business have a negative influence on entrepreneurship.

Hypothesis 4a: Procedures for starting a business have a lower influence on entrepreneurship in Latin American countries than in developed countries.

Another important formal institution considered in the entrepreneurship literature is financial assistance. In a study of individuals who had business ideas but who had not created a firm, van Auken (1999) found that financial constraints were the main obstacle. Several

studies have found that policies for increasing access to bank credit by lowering capital requirements, the creation of investment companies, credit with low interest rates, and credit guarantee schemes, all contribute to the promotion of new businesses (Gnyawali & Fogel, 1994; van Gelderen, Thurik & Bosma, 2005).

Again, in the context of Latin America, which is characterized by higher rates of unofficial economy, entrepreneurs have even fewer bank guarantees than in the case of developed countries and the access to credit is also more difficult.

Therefore:

Hypothesis 5: Access to bank credit has a positive influence on entrepreneurship.

Hypothesis 5a: Access to bank credit has a lower influence on entrepreneurship in Latin American countries than in developed countries.

The last formal factor analyzed in this research is business and entrepreneurial skills. The literature reports that people's behavior would be guided by their knowledge and skills. Specifically, empirical evidence shows that a higher level of education has a positive effect on the likelihood of starting a business (Davidsson & Honig, 2003; De Clerq & Arenius, 2006). Other studies found that a low level of technical and business skills could prevent motivated entrepreneurs from starting a new venture (Davidsson, 1991; Gnyawali & Fogel, 1994). Thus, individuals might be more inclined to start a business if they have the necessary skills (Arenius & Minniti, 2005; Boyd & Vozikis, 1994; Chen et al., 1998; Davidsson & Honig, 2003; Scott & Twomey, 1988).

These arguments could be valid for developed countries characterized by some level of innovation. However, as stated before, in Latin America the educational level of the population is low and the percentage of the unofficial economy is high (OCDE, 2009).

Thus, we propose the following hypotheses:

Hypothesis 6: Business and entrepreneurial skills have a positive influence on entrepreneurship.

Hypothesis 6a: Business and entrepreneurial skills have a lower influence on entrepreneurship in Latin American countries than in developed countries.

3. Data and methods

As we noted earlier, this paper analyzes the relationship between environmental factors and entrepreneurial activity using a panel of data for the period 2004–2009. These factors are operationalized through informal (political stability, control of corruption, role models) and formal institutions (procedures for starting a business, access to bank credit, business and entrepreneurial skills).

The source of data to measure the dependent variable is the total entrepreneurial activity (TEA) rates, the best-known indicator of the Global Entrepreneurship Monitor (GEM), which defines entrepreneurs as adults in the process of setting up a business they will at least partly own, and/or are currently owning and managing an operating young business (up to 3.5 years old).

The data on independent variables, specifically on informal institutions such as the political stability (PS) and the control of corruption (CC), were obtained from the Worldwide Governance Indicators (WGI) project. All the scores lie between -2.5 and 2.5, with higher scores corresponding to better outcomes of the institutions.

Specifically, political stability (PS) captures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. In turn, control of corruption (CC) captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Finally, role models (RM) are obtained from the GEM database and they refer to the percentage of individuals who personally know someone who started a new business during the last two years (Reynolds, Bosma, Autio, Hunt, De Bono, Servais, Lopez-Garcia & Chin, 2005). In the case of formal institutions, procedures for starting a business (PC) were taken from the World Bank's Doing Business project, which provides objective measures of business regulations and their corresponding implementation in 183 countries. Specifically, the PC variable is the natural logarithm of the product between the number of procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business, and the duration of these procedures. Lastly, the access to credit (AC) variable was obtained from the domestic credit indicator provided by the banking sector from the World Bank and includes all the credit to various sectors. Business and entrepreneurial skills (BS) were obtained from the UNESCO database, and from the product resulting between the percentage of the population that has attained tertiary education and the percentage of tertiary graduates in social sciences, business and law.

Finally, given that the level of economic development of countries is a key factor in explaining entrepreneurial activity (Carree, van Stel, Thurik & Wennekers, 2007; Wennekers et al., 2005), we use as the control variable per capita income (PI) measured as the gross domestic product at purchasing power parity per capita from the International Monetary Fund. Also, in order to control other characteristics, we include binary variables for group countries: a) Latin American countries and b) high-income countries[2].

Table 1 presents a list of dependent and independent variables used in this study, including their sources. Our final sample consists of an unbalanced panel with data on 243 observations and 70 countries[3] (see annex 1 for a list of countries).

As noted previously, entrepreneurial activity is influenced by environmental factors, measured through informal and formal institutions. Therefore, we propose the following general model:

$$TEA_{it} = \alpha + \beta_1 II_{it-1} + \beta_2 FI_{it-1} + \beta_3 CV_{it-1} + \varepsilon_{it-1} \quad (1)$$

2 Latin American countries are classified as developing regions according to the United Nations. Also, we use the classification of World Bank for high-income countries.

3 Although the panel data refers to the period 2004-2009, the number of observations depends on the annual regularity with which the countries participate in the GEM project. For example, Spain has participated every year, Hong Kong for three years and Austria only for two years.

TABLE 1. Description of variables

Variable		Description	Source[a]
Dependent variable	Entrepreneurial activity (TEA)	Total entrepreneurial activity. Natural logarithm of Percentage of adults aged 18–64 setting up a business or owning–managing a young firm (up to 3.5 years old), including self-employment (Reynolds et al., 2005).	GEM 2004 to 2009
Environmental factors Informal institutions	Political stability (PS)	Political stability and absence of violence (PS) –capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. The values are between -2.5 and 2.5 with higher scores corresponding to better outcomes of institutions (Kaufmann et al, 2008).	WGI 2003 to 2008
	Control of corruption (CC)	Control of corruption (CC) – capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. The values are between -2.5 and 2.5 with higher scores corresponding to better outcomes of institutions (Kaufmann et al, 2008).	WGI 2003 to 2008
	Role models (RM)	Percentage of individuals who know someone personally who started a business in the past 2 years (Reynolds et al., 2005).	GEM 2004 to 2009
Environmental factors Formal institutions	Procedures for starting a business (PC)	Natural logarithm of the product between the number of procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business and the duration of these procedures.	*Doing Business* 2004 to 2009
	Access to credit (AC)	Domestic credit indicator provided by the banking sector which includes all credit to various sectors.	World Bank 2003 to 2008
	Business and entrepreneurial skills (BS)	Percentage of individuals who have business and entrepreneurial skills. It is obtained as the product of percentage of tertiary graduates in the population multiplied by percentage of tertiary graduates in social sciences, business and law.	*UNESCO* 2003 to 2008
Control variable	Per capita income (PI)	Natural logarithm of gross domestic product at purchasing power parity per capita (U.S. dollar).	IMF 2003 to 2008

[a] Doing Business. *http://www.doingbusiness.org/*; GEM. Global Entrepreneurship Monitor (GEM). *http://www.gemconsortium.org/*; IMF International Monetary Fund, World Economic Outlook Database, October 2008. *http://www.imf.org/external/pubs/ft/weo/2008/02/weodata/index.aspx*; UNESCO. *http://www.uis.unesco.org/ev.php?URL_ID=3753&URL_DO=DO_TOPIC&URL_SECTION=20*; WGI Worldwide Governance Indicators. *http://info.worldbank.org/governance/wgi/index.asp*; World Bank. *http://data.worldbank.org/indicator*.

where:

II_{it-1}: matrix of informal institutions in country i in year t

FI_{it-1}: matrix of formal institutions in country i in year t

CV_{it-1}: matrix of the control variable in country i in year t

We estimate all the regressions using country random effects. The natural alternative specification is fixed effects; however, fixed effects are not feasible in our set-up, given that there is enough country variation in the procedures for starting a business variable. The random effects specification is supported by Hausman's specification test ($\chi^2(8) = 4.59$, Prob $> \chi^2 = 0.7097$), which rejects the null hypothesis that errors are independent within countries. Moreover, given that it is likely that the level of entrepreneurial activity in period t is associated with the level of entrepreneurial activity in period t-1, a test is applied for serial correlation in the idiosyncratic errors of a linear panel-data model. We find that autocorrelation problems exist (F(1, 38) = 5.494, Prob $> F = 0.0244$). Finally, since heteroskedasticity is detected, we estimate linear regressions with panel-corrected standard errors (PCSE). In addition, to contrast the specific hypotheses related to Latin America, the sample is divided as follows: a) Latin American countries and b) high-income countries.

4. Results and discussion

Table 2 reports the means, standard deviations, and correlation coefficients of the variables used in this study, and the table 3 shows the results of linear regressions with panel-corrected standard errors (PCSE)[4]. Model 1 includes all the countries considered in the sample, model 2 includes only Latin American countries, and model 3 considers high-income countries. All the models are highly significant (p < .001) and have high explanatory power, explaining well over 51% of the variance of entrepreneurial activity.

TABLE 2. Correlation matrix and descriptive statistics

	All countries		Latin American countries		High income countries	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1. TEA	9.77	7.06	17.28	7.72	6.42	2.85
2. Political stability (PS)	0.31	0.84	-0.29	0.75	0.80	0.55
3. Control of corruption (CC)	0.77	1.05	-0.08	0.71	1.47	0.71
4. Role models (RM)	42.24	10.61	45.29	8.28	38.94	9.21
5. Procedures (PC)	339.02	502.47	916.04	847.48	172.82	205.43
6. Access to credit (AC)	103.46	64.49	46.34	27.43	133.69	60.74
7. Business and entrepreneurial skills (BS)	2.45	1.27	1.70	0.43	2.60	1.08
8. Per capita income (PI)	22.97	13.40	10.22	2.77	32.93	8.28

	1. TEA	2. PS	3. CC	4. RM	5. PC	6. AC	7. BS
1. TEA							
2. Political stability (PS)	-0.534***						
3. Control of corruption (CC)	-0.466***	0.811***					
4. Role models (RM)	0.494***	-0.197**	-0.235***				
5. Procedures (PC)	0.358***	-0.378***	-0.435***	0.100			
6. Access to credit (AC)	-0.357***	0.494***	0.602***	-0.289***	-0.275***		
7. Business and entrepreneurial skills (BS)	-0.184**	0.134*	0.152*	-0.051	-0.282***	0.08	
8. Per capita income (PI)	-0.530***	0.708***	0.833***	-0.361***	-0.426***	0.602***	0.209*

*** p < 0.001; ** p < 0.01; * p < 0.10.

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4 Given the correlations among the several independent and control variables, we tested for the problem of multicollinearity, which might affect the significance of the main parameters in the regressions through variance inflation factor (VIF) computations. The VIF values were low (lower than 5.03).

TABLE 3. Regression analysis explaining entrepreneurial activity (TEA)

	Model 1 All countries	Model 2 Latin American countries	Model 3 High income countries
Informal institutions			
Political stability (PS)	-0.189 (0.052)***	-0.282 (0.053)***	0.001 (0.068)
Control of corruption (CC)	0.051 (0.060)	0.217 (0.08)***	-0.102 (0.087)
Role models (RM)	0.016 (0.003)***	0.018 (0.006)***	0.013 (0.004)***
Formal institutions			
Procedures (PC)	-0.069 (0.031)**	0.057 (0.040)	-0.064 (0.039)
Access to credit (AC)	0.001 (0.001)	-0.003 (0.001)**	-0.000 (0.001)
Business and entrepreneurial skills (BS)	0.019 (0.028)	0.123 (0.114)	1.094 (0.040)***
Control variable			
Per capita income (PI)	-0.287 (0.087)***	-0.527 (0.145)***	0.280 (0.234)
Latin American (LA)	0.686 (0.091)***		
Constant	2.343 (0.360)***	2.663 (0.427)***	0.477 (0.827)
Rho	0.493	0.184	0.509
R^2	0.7392	0.8270	0.5197
Observations	238	44	141
Countries	68	12	32

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Note: Heteroskedasticity corrected standard errors are shown in parentheses.

As mentioned before, the first model analyzes the effect of informal (political stability, control of corruption, and role models) and formal institutions (the number of procedures to start a business, management and administration training, and access to bank credit) on entrepreneurial activity, controlling for per capita income and including a dummy variable for Latin American countries. The results indicate that the political stability, role models, and procedures coefficients are highly significant and of the expected sign. The other variables are not significant. This model explains 74% of the total variation of entrepreneurial activity.

The estimated coefficient of the control variable, per capita income, is consistent with the existing literature, which indicates a negative and significant correlation between entrepreneurial activity and development level. This result could be explained by necessity entrepreneurship, which usually happens in less developed countries (Reynolds, Camp, Bygrave, Autio & Hay, 2001).

The second model shows the relationship between informal and formal institutions and entrepreneurial activity in Latin American countries. The results indicate that all the informal institutions have a statistically significant impact on entrepreneurial activity (p<0.001); thus, we confirm the importance of informal institutions to promoting entrepreneurial activity in Latin American countries. In this model, R^2 increases with respect to model 1, indicating that in terms of R^2 it is a better model, and it explains 82% of the total variation of entrepreneurial activity. Model 2 shows that political stability has a significant and negative impact ($b = -0.282$, $p < 0.01$) on the natural logarithm of entrepreneurial activity, as proposed in hypothesis 1, while the coefficient of control of corruption is positive and significant. Also, the role models variable has a positive and significant (p < 0.01) influence on entrepreneurial activity, in line with the previous literature reviewed (Krueger, 1993; Scherer et al., 1989; Shapero & Sokol, 1982; van Auken

et al., 2006; among others). The coefficient of the control variable, per capita income, is negative and significant, thus entrepreneurial activity decreases when per capita income is higher.

The third model considers institutions and control variables, for a subsample of high-income countries. The results show that informal institutions such as political stability and control of corruption are not significant, while the reference models have a positive and significant influence ($p < 0.01$) on entrepreneurial activity. Also, formal institutions such as business and entrepreneurial skills have a positive and significant relationship with entrepreneurship. Thus, in the case of high-income countries, characterized by higher rates of opportunity for entrepreneurship, business and entrepreneurial skills encourage entrepreneurial activity, while in Latin American countries this variable is not significant. Likewise, the positive and significant sign of business and entrepreneurial activity would indicate that is not enough to have the knowledge to start a business; interaction with role models would also be necessary for a positive and significant influence on behavior entrepreneurship. Also, note that the control variable, per capita income, is not significant in this sample of countries. Model 3 only explains 52% of the variation in entrepreneurial activity in high-income countries.

Concerning the hypotheses testing, hypothesis 1 proposes a U-shaped relationship between political stability and entrepreneurship and hypothesis 1a suggests that political stability has a lower influence on entrepreneurial activity in Latin American countries than in developed countries. Models 1 and 2 show that political stability has a negative and significant influence on entrepreneurial activity[5] in all countries ($b = 0.189$, $p < 0.01$) and in Latin American countries ($b = 0.282$, $p < 0.01$), while this relationship is not significant in high-income countries. Thus, hypothesis 1 is supported by the data but hypothesis 1a is rejected. The results show a U-shaped relationship between political stability and entrepreneurial activity, similar to the relationship between economic develop-

ment and entrepreneurship (Carree et al., 2007; Wennekers & Thurik, 1999; Wennekers et al., 2005). Then, in countries with low levels of per capita income, political stability is low and the economy is characterized by a high level of entrepreneurial activity and the prevalence of small businesses. While per capita income and political stability increase, entrepreneurial activity decreases.

Also, hypothesis 2 suggests that control of corruption has a U-shaped relationship with entrepreneurial activity and hypothesis 2a proposes that control of corruption has a lower influence on entrepreneurship in Latin American countries than in developed countries. The results show that the coefficient of control of corruption is positive and significant for Latin American countries, but it is not significant in models 1 and 3. Then, hypotheses 2 and 2a are rejected by our data.

Hypothesis 3 suggests that role models have a positive influence on entrepreneurship. This hypothesis is supported by our data, in line with the literature; the presence of entrepreneurs transmits positive messages to potential entrepreneurs (Gnyawali & Fogel, 1994), increasing the rates of entrepreneurial activity. Hypothesis 3a proposes that role models have a higher influence on entrepreneurship in Latin American countries than in developed countries. The results show that the role models coefficient in the Latin American model is higher than the coefficient in high-income countries, supporting hypothesis 3a. As it will be explained later, while in Latin American countries role models are important for facilitating the entry of new firms, in high-income countries business and entrepreneurial skills are more relevant.

Hypothesis 4 suggests that the procedures for starting a business have a negative influence on entrepreneurship. The coefficient in model 1 is negative and significant, supporting hypothesis 4; thus, lower procedures for starting a business would be related to higher entrepreneurial activity. Also, hypothesis 4a proposes that the procedures for starting a business have a lower influence on entrepreneurship in Latin American countries than in high-income countries. The results in models 2 and 3 show that the coefficients are not significant, and are

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5. We use the natural logarithm of entrepreneurial activity as the dependent variable to linearize the relationship.

positive in the case of Latin American countries and negative in the case of high-income countries. Thus, our data reject hypothesis 4a. This result, which contradicts the assumptions of the Doing Business project, could be explained by high rates of necessity entrepreneurship in these countries, where a high percentage of the population are forced to start a business for their livelihood as part of the unofficial economy. Regarding the impact of regulation van Stel, Storey & Thurik (2007) propose an explanation for the absence of a statistically significant impact of regulation (in particular business regulation) on nascent and young entrepreneurship. They point out that regulations influence the distribution between official and unofficial entrepreneurship rather than the total amount of entrepreneurship. This issue is very relevant in the context of Latin America, where the percentage of the unofficial economy is much higher than in developed countries.

The access to bank credit variable is not significant in model 1, rejecting hypothesis 5, and it is negative and significant in the subsample of Latin American countries but not significant in the subsample of high-income countries. Thus, our data rejected hypothesis 5a. One possible explanation for the counterintuitive negative sign in Latin American countries could be related to higher rates of necessity entrepreneurship.

Finally, hypothesis 6 is rejected; business and entrepreneurial skills do not have a significant influence on entrepreneurship. In contrast, the data provide strong support for hypothesis 6a since the coefficient of business and entrepreneurial skills is not significant in the sample of Latin American countries while it is positive and significant in the case of high-income countries.

5. Conclusions

In this paper longitudinal panel data (period 2004-2009) is used to investigate empirically the relationship between institutions and entrepreneurial activity. From an institutional approach (North, 1990 and 2005) applied to the field of entrepreneurship, and using Gnyawali and Fogel's (1994) model, we analyze the influence of informal (political stability, control of corruption, and role models) and formal institutions (procedures for starting a business, access to bank credit, and business and entrepreneurial skills) on entrepreneurial activity.

The research generates three key results. First, there is evidence of a U-shaped relationship between political stability and entrepreneurial activity. A low level of political stability, measured as the probability that the state is subject to violent threats and change, is related to high rates of entrepreneurial activity in developing countries, especially necessity entrepreneurship.

Second, in Latin American countries informal institutions are more important than formal institutions. Thus, the promotion of entrepreneurship through formal institutions such as access to credit, lower procedures, and more formal education would have to be accompanied by more and better role models, a higher level of political stability, and more control of corruption. These changes imply an initial decrease in the rates of entrepreneurial activity, but better quality and sustainability of the newly created businesses.

Finally, the analyzed models to explain entrepreneurial activity through institutions are quite adequate and robust in the case of Latin America, but it is necessary to complement them and consider better explanation variables for high-income countries.

Regarding future research lines, it is suggested that progress should be made in the characterization of entrepreneurial activity and the factors that determine it, distinguishing opportunity entrepreneurship (starting a business by taking advantage of an entrepreneurial opportunity) versus necessity (starting a business because other employment options are either absent or unsatisfactory). It is also necessary to advance in the operationalization of institutions, for example specifying the variables business and entrepreneurial skills, and access to credit. Finally, we reaffirm institutional economics as an appropriate and robust theoretical framework for the study of the environmental factors that influence entrepreneurial activity, specifically in the context of the GEM project (Alvarez & Urbano, 2011; Thornton et al., 2011; Urbano, Rojas & Díaz, 2010).

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Annex 1. Countries

Countries	Latin America	High income	Countries	Latin America	High income
Algeria			Lebanon		
Argentina	Yes		Malaysia		
Australia		Yes	Mexico	Yes	
Austria		Yes	Morocco		
Belgium		Yes	Netherlands		Yes
Bosnia and Herzegovina			New Zealand		Yes
Brazil	Yes		Norway		Yes
Canada		Yes	Panama	Yes	
Chile	Yes		Peru	Yes	
China			Portugal		Yes
Colombia	Yes		Puerto Rico		Yes
Croatia		Yes	Romania		
Denmark		Yes	Russia		
Dominican Republic	Yes		Saudi Arabia		Yes
Ecuador	Yes		Serbia		
Egypt			Singapore		Yes
Finland		Yes	Slovenia		Yes
France		Yes	South Africa		
Germany		Yes	Spain		Yes
Greece		Yes	Sweden		Yes
Guatemala	Yes		Switzerland		Yes
Hong Kong		Yes	Syria		
Hungary		Yes	Thailand		
Iceland		Yes	Tonga		
India			Tunisia		
Iran			Turkey		
Ireland		Yes	Uganda		
Israel		Yes	United Arab Emirates		Yes
Italy		Yes	United Kingdom		Yes
Jamaica			United States		Yes
Japan		Yes	Uruguay	Yes	
Jordan			Venezuela	Yes	
Korea		Yes	West Bank & Gaza Strip		
Latvia			Yemen		