Institutional factors, opportunity entrepreneurship and economic growth: panel data evidence

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Abstract: This paper explores the institutional factors that encourage opportunity entrepreneurship in order to achieve higher rates of economic growth. We suggest that institutions may not have an automatic effect, as is typically assumed in models of endogenous growth. Rather, a mechanism is required to serve as a conduit into the society for those institutional factors that affect productive behavior such as entrepreneurial activity. Thus, opportunity entrepreneurship is identified as one such mechanism that impacts on economic growth. Using a three-stage least-square method through unbalanced panel data with 43 countries (2004-2012), we find that informal institutions have a higher impact on opportunity entrepreneurship than formal institutions. Variables such as control of corruption, confidence in one's skills and private coverage to obtain credit promote a positive effect of opportunity entrepreneurship on economic growth in all the countries of our sample, and especially in Latin American countries as a homogeneous group. These results suggest additional elements to the theoretical discussion in terms of the importance of institutions such framework to understand determinants and effects of opportunity entrepreneurship. Regarding

policy implications, the results also suggest that it could be possible to obtain economic growth encouraging the appropriate institutions in order to increase the entrepreneurship by opportunity.

Key Words: Institutional economics, opportunity entrepreneurship, economic growth, panel data analysis, Latin American countries.

1. Introduction

Innovative entrepreneurs, on one hand, have emerged as a crucial source of growth for virtually all of the traditional units of economic analysis, encompassing individual behavior with respect to the firm, region and nation (Acs et al., 2008; Acs et al., 2012; Audretsch and Keilbach, 2004a,b, 2008). On the other hand, many scholars are interested in understanding those factors that encourage entrepreneurship, and especially entrepreneurial activity based on knowledge (Thornton et al., 2011). According to these authors, institutional factors are important elements in explaining entrepreneurship rates at the individual and country levels. In general terms, in endogenous growth theory, it is assumed that the entire geographic context, typically a country, will automatically benefit from accurate institutional arrangements (Acemoglu, 2006; Acemoglu and Robinson, 2008). The general underlying assumption of this approach is that better institutions are automatically available to all the agents in the economic process. Since institutions behave like a public good, all agents will benefit from these factors, which will increase the rate of economic growth (North, 1990) in a knowledge-based economy.

The question of which factors affect growth has been studied since the late 1950s. Solow (1956) and Swan (1956) suggest that capital, labor and productivity explain the rates of growth in each economy. In research conducted in the late 1980s, Lucas (1988) and Romer (1986) add new elements to the traditional factors explicitly explaining economic growth. Since then, many articles have contributed to a large literature linking the traditional factors of production, capital and labor to economic growth (Solow, 2007). For instance, North (1990) suggests that institutions (e.g. rules, norms, culture and so on) might affect the growth process and explain the differences across countries. Following this idea, Acemoglu (2006) and Acemoglu and Robinson (2008) explore the development process of several countries based upon their institutional settings. According to them, institutions affect the individuals and firms in the regions and countries. A similar explanation is provided by Rodrik (2003), who suggests that growth and development are achieved depending on

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endogenous factors, which at the same time are influenced by institutions. One of the endogenous factors suggested by this author concerns entrepreneurial behavior, especially that based on knowledge, which is capable of generating employment and diversifying the national production.

Several authors, such as Acs et al. (2012), Audretsch (2007), Audretsch and Keilbach (2004a,b, 2005, 2007, 2008) and Audretsch et al. (2008), provide empirical evidence about the importance of entrepreneurship based on knowledge to achieve higher economic growth. These authors use measures such as opportunity entrepreneurship and high-tech entrepreneurship, among others, to approximate entrepreneurial activity based on knowledge. One important conclusion derived from these studies concerns the necessity of an institutional framework to explain how the entrepreneurial activity is configured in each location. This idea is also claimed by Bjørnskov and Foss (2013) and Nissan et al. (2011), who find that institutions affect economic growth, specifically formal institutions, such as procedures or the time needed to create a new business, indicating that regulation can influence the context in which entrepreneurship affects economic growth. Audretsch and Keilbach (2008) and Baumol and Strom (2007) discuss the importance of understanding how entrepreneurship is configured by taking into account culture, beliefs and social values, among other factors, to obtain the best understanding of the role of entrepreneurship in economic growth. In that sense, Bruton et al. (2010) suggest that institutional economics could be useful for understanding which factors encourage opportunity entrepreneurship behavior in order to increase the economic growth rate. Also, according to these authors, there is a lack of studies that consider the importance of informal factors in the entrepreneurial context to achieving higher economic growth. According to Urbano and Alvarez (2014), these factors have more influence on entrepreneurship than formal ones. Future research lines could be studied in order to obtain a broader comprehension of economic growth affected by opportunity entrepreneurship, which at the same time is shaped by institutional factors (Carlsson et al., 2013). According to these authors, studies on this line could unite two separate research fields in entrepreneurship research. Furthermore, Bruton et al. (2010) and Stenholm, Acs and Wuebker (2013), among others, suggest that the future studies focusing on solve this problem could pay special attention on emerging economies, given their internal difficulties and government efforts to solve they, in where entrepreneurship of higher impact plays a key role. In addition, policy and theoretical implications could be discussed regarding institutional economics as a framework for understanding the link

between opportunity entrepreneurship and economic growth (Bruton et al., 2010), also considering the specific case of emerging economies such as Latin American countries.

Thus, in this paper, we use institutional economics (North, 1990, 2005) applied to the analysis of opportunity entrepreneurship and economic growth as a conceptual framework. In this context, institutional factors determine entrepreneurial activity by opportunity. These can be identified as formal factors (the procedures and costs to start a business, access to credit, etc.) and informal factors (attitudes towards entrepreneurship, perception of corruption, etc.). Furthermore, to operationalize 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.

Therefore, the purpose of this paper is to explore the institutional factors that encourage opportunity entrepreneurship in order to achieve higher rates of economic growth. Our specific objectives are first to develop a three-stage least-square (3SLS) model in unbalance panel data to assess the simultaneous effect of institutional factors on opportunity entrepreneurship, which allows the achievement of economic growth. Second, using this model, we provide empirical evidence about the simultaneous effect between institutional factors and opportunity entrepreneurship and its subsequent impact on economic growth, focusing our attention on Latin American countries. These two specific objectives lead to two contributions to the existing literature in terms of theoretical implications regarding the relevance of such an institutional economics framework to entrepreneurship and a policy discussion regarding the importance of institutional (specifically informal) factors to encourage opportunity entrepreneurship leading to higher economic growth in Latin American countries.

The advantages of using 3SLS are the ability to overcome the endogeneity problem between entrepreneurship and economic growth, as Acs et al. (2012) point out, as well as to assess simultaneously two models that are inter-related, excluding possible biases due to heteroskedasticity problems. Specifically, we use unbalanced panel data for 43 countries in the period from 2004 to 2012 from the Global Entrepreneurship Monitor (GEM), Doing Business, World Development Indicators and Worldwide Government Indicators (World Bank). Analyzing these data through the econometric model, we provide empirical evidence that the informal factors have a greater and more positive effect on opportunity entrepreneurship than the formal factors and that opportunity entrepreneurship is an element that allows higher growth rates. This pattern is

similar whether we control for Latin American countries; however, their coefficients are lower than those of the whole sample. Only in the growth model do we find significant differences due to the greater impact of opportunity entrepreneurship on growth regarding only Latin American countries.

In Section 2, we present the theoretical framework concerning institutional economics and the importance of opportunity entrepreneurship to economic growth. In Section 3, the methodology used is described. Then, we discuss and analyze the results in terms of policy implications in Section 4. Finally, in Section 5 we conclude and discuss future research lines.

2. Conceptual framework

2.1 Institutions and opportunity entrepreneurship

As we mentioned earlier, this article focuses on institutional economics (North, 1990, 2005). This author defines institutions as 'rules of the game in a society, or more formally, (—) the constraints that shape human interaction' (North, 1990, p. 3). These institutions can be either formal, such as regulations, contracts, procedures, etc., or informal, such as the culture, values or social norms of a particular society. As North (1990) suggests, formal institutions intend to reduce the transaction costs based on regulations, whereas informal institutions exist to reduce the uncertainty caused by the decision making of all individuals (North, 2005). One additional conclusion of this framework is related to the interactions between formal and informal institutions, whereby some regulations could be efficient depending on the cultural values and intentionality of a society. Thus, informal institutions constrain the nature of formal institutions and vice versa. Meanwhile, formal institutions can change in a short period of time; informal institutions change more slowly than formal institutions (Williamson, 2000).

According to Bruton et al. (2010), the application of institutional economics is especially helpful to entrepreneurial research. In that sense, the intentionality of innovative individuals toward entrepreneurial decisions could depend on the context in which they are involved and it can lead to different patterns of growth (Bruton et al., 2010, p. 426). Thus, the productive and entrepreneurial decisions chosen by human behavior are influenced by institutional factors (Thornton et al., 2011). This idea has expanded into the field of entrepreneurship research, in the sense that both formal and informal institutions could either constrain or foster the decision to create a new business based on knowledge and opportunity perceptions (Alvarez and Urbano, 2011). Thus, some scholars propose the application of institutional economics to the analysis of

entrepreneurship (Aidis et al., 2008; Alvarez and Urbano, 2011; Salimath and Cullen, 2010; Thornton et al., 2011; Turró et al., 2014; Urbano and Alvarez, 2014; Veciana and Urbano, 2008; Welter, 2005; among others). One approach to this framework is suggested by Gnyawali and Fogel (1994), who propose five dimensions of the entrepreneurial environment: a) government policies and procedures, b) social and economic factors, c) entrepreneurial and business skills, d) financial assistance to businesses and e) non-financial assistance. Following this study, and adapting the approach of North (1990, 2005), government policies and procedures and financial and non-financial assistance to businesses are related to formal institutions, while social conditions, such as confidence and perceptions of the environment, concern informal institutions.

The distinction between formal and informal institutions, following North (1990, 2005), or as Gnyawali and Fogel (1994) suggest in their dimensions, is necessary because formal institutions reflect the values built into the society that have been reinforced by laws and regulatory norms (Veciana and Urbano, 2008). Furthermore, the relevance of this distinction to entrepreneurial decisions concerns their sensibility to formal and informal factors. As we noted earlier, informal institutions tend to endure for longer than formal institutions; therefore, it is expected that entrepreneurship responds more to informal than formal factors, an idea assessed empirically by Knörr et al., (2013) and Urbano and Alvarez (2014).

In terms of measures, some proxies for informal factors involve the capacity to establish social norms as well as the ability to interpret information regarding entrepreneurial behavior (Stenholm et al., 2013). Some authors find that values, beliefs and social norms, among others, impact on entrepreneurship. For instance, McClelland (1961) in psychology, Collins (1997) and Delacroix and Nielsen (2001) in sociology, Becker and Woessmann (2009) in economics and Urbano and Alvarez (2014) in entrepreneurship research test institutional factors to explain different measures of entrepreneurial activity. As a singular conclusion, they suggest that informal institutions have a greater impact on entrepreneurship than formal ones. Following Stenholm et al. (2013), other measures of informal factors could affect entrepreneurial behavior, referring to the perceptions of the policies and regulations implemented by governments. These regulations and policies are related to the traditions and institutions by which authority is exercised in a particular country. It includes a number of factors: the process by which the government is 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 (Djankov et al., 2002; Kaufmann et al., 2008). Although some studies provide empirical evidence concerning the relationship between governance and indicators of economic welfare, including economic growth and development (Acemoglu, 2006; Acemoglu and Robinson, 2008; Kaufmann and Kraay, 2003), other authors suggest that governance factors perceived by society could encourage or discourage the business dynamics in which entrepreneurship is involved (Djankov et al., 2005, 2006; Johnson et al., 1999; Johnson et al., 2000a; McMillan and Woodruff, 1999, 2002; van Stel et al., 2007).

Comparative studies at the country level show positive relationships between favorable governance indicators and entrepreneurial activity (Aidis et al., 2008). According to Douhan and Henrekson (2010), entrepreneurship could be affected by inefficient institutions, represented by mafia and corruption. Méon and Sekkat (2005) claim that corruption distorts the individual perception of the governance capacity, which falls in inefficiency due to a bureaucratic governance structure. Klapper et al. (2006) and Méon and Weill (2010) find that the effect of inefficient institutions is higher when countries have a high level of corruption. Dreher and Gassebner (2013) find that corruption reduces the dynamic of entrepreneurial entry. Thus, countries with higher levels of corruption may affect the development of entrepreneurship negatively (Akimova, 2002). At the same time, Aidis (2005) provides evidence that the informal institutions perceived, such as entry barriers through corruption, are associated with managerial problems, discouraging the behavior of entrepreneurship. Taking into account the negative influence of this variable, other authors, such as Aidis et al. (2008), investigate how informal institutions, represented by the control of corruption, affect the entrepreneurial activity. This variable is perceived as a good sign by entrepreneurs. In terms of these authors, control of corruption would increase the likelihood of future entrepreneurs to capture a greater share of the revenue they generate, increase the reliability of cash flows and thus motivate higher levels of entrepreneurial activity. In addition, control of corruption could allow an increase in the amount of budget constraints related to the education system as well as research and development (R&D), which are additional factors to encourage entrepreneurship by opportunity. Hence, the importance of controlling this factor could mean more opportunities to create new businesses (Aidis et al., 2008) based on technology and with higher added value.

In terms of groups of countries, Wennekers et al. (2005) provide evidence for developed nations with a high level of control of corruption. According to these authors, greater control of

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corruption means an accurate institution to increase entrepreneurial activity, in particular opportunity entrepreneurship (people who start their own business to take advantage of an entrepreneurial opportunity). Concerning developing countries, Aidis (2005) analyzes the effect of corruption on business entry. According to this author, developing countries face a multitude of barriers affecting business operations and creation, in which corruption plays a negative role (Bohata and Mladek, 1999). Johnson et al. (2000b) find that some hiding of the output of businesses in countries such as Poland, Slovakia and Romania is significantly associated with a high level of bureaucratic corruption, discouraging entrepreneurial activity through high entry barriers. Fadahunsi and Rosa (2002) explore the effect of corruption on entrepreneurship, suggesting that this is endemic in most developing countries (Sardar, 1996). They focus specifically on Nigeria. They find that where law enforcement is weak and corruption is prevalent, legal entrepreneurship based on knowledge and capabilities to generate exports is discouraged. Thus, entrepreneurship by opportunity tends to decrease. Regarding other developing countries, such as Latin American countries, Alvarez and Urbano (2011) establish that control of corruption has a positive but lower impact on entrepreneurship by opportunity with respect to developed countries. They argue that these countries are characterized by high rates of unofficial economy and entrepreneurs would assume the payment of bribes and other inefficient market conditions to be a business cost. Following these authors, this behavior leads to more trust in themselves in order to reduce the uncertainty and avoid the higher cost imposed by the government and its possible corruption. According to Acs and Virgill (2010), entrepreneurs redefine their choices regarding the market imperfections and in addition use various gap-filling and, perhaps, second-best solutions (Douhan and Henrekson, 2010). In cases in which market and non-market failures are pervasive, entrepreneurs are pushed within the informal sector (Acs and Virgill, 2010). Consequently, we propose the following hypotheses:

H1. *Control of corruption has a positive influence on opportunity entrepreneurship.*

H1a. *Control of corruption has a positive but lower influence on opportunity entrepreneurship in Latin American countries than in all the countries in the sample.*

Another informal factor considered in this paper is the confidence in skills. This institution is also very relevant to the decision to start a business, in particular those new businesses that require a high level of knowledge (Estrin and Mickiewicz, 2012). People who believe in their own abilities and skills are used to perceiving a lower level of uncertainty and having more confidence

in their role as entrepreneurs and a higher likelihood of starting a new business venture (Estrin and Mickiewicz, 2012).

According to Harper (2003), entry decisions are conditional on individual skills as well as on the national economic context. Some skills related to new business creations are powered by the self-confidence of each entrepreneur (van Hemmen et al., 2013). According to these authors, confidence in skills could promote positive interaction between the groups that form each new firm based on opportunity. Furthermore, self-confidence encourages other entrepreneurs to engage in productive activities (van Hemmen et al., 2013). With respect to the benefits for each entrepreneur, Harper (2003) suggests that confidence in one's skills enhances the feelings of internal control and personal agency, which at the same time promote the alertness in entrepreneurs. This alertness sensitivity leads to opportunity perceptions with a lower level of uncertainty. Thus, confidence in one's skills affects positively the capacity to create new businesses by opportunity with a higher potential for growth. In this sense, Estrin and Mickiewicz (2012) find empirical evidence about the impact of confidence in one's skills on entrepreneurship. According to these authors, a low level of confidence impacts negatively on entrepreneurship. Baron (2000) suggests that the decision to start a new business has a relationship with intentionality and locus of control, which motivate entrepreneurial alertness and self-efficacy and, therefore, lead to more entrepreneurship (Harper, 1998). In addition, Gartner (1985) claims that the entrepreneurial process requires intentional repeated attempts to achieve success in each entrepreneurial endeavor. New business formation is a complex and demanding task requiring self-perseverance. Entrepreneurs and non-entrepreneurs differ in such properties, and entrepreneurs are more likely to have self-confidence than other individuals (Markman et al., 2002; Markman, Baron and Balkin 2005). Hence, individual self-confidence, defined as individuals' belief in their skills and capability to perform a task, affect the development of both entrepreneurial intentions and actions or behaviors (Boyd and Vozikis, 1994; Minniti and Nardone, 2007). According to Verheul et al. (2005), confidence in one's own skills and ability to become an entrepreneur increases entrepreneurial alertness and, therefore, leads to the creation of more new businesses. Therefore, confidence and skills are achieved in the process in which individuals live and, in some cases, lead to entrepreneurial decisions.

According to Koellinger (2008), developing countries present abundant opportunity entrepreneurship in terms of imitative entrepreneurship, which is still potentially profitable. This author attributes the capacity of people in developing countries to manage their confidence in their

skills to transform that opportunity into a new business. Koellinger et al. (2007) assess the response of entrepreneurial activity in some developed and developing countries to the confidence in one's skills. Indeed, they find a positive and statistically significant relationship between this factor and nascent entrepreneurship guided by opportunity. Additionally, they find that some countries present overconfidence in setting up a new business, and some developing countries in their sample show this pattern. Stenholm et al. (2013) present similar ideas. Their study focuses on the effect of education and confidence in abilities and skills on opportunity entrepreneurship. They discuss individuals in emerging economies as possibly presenting a higher education level, but having lower abilities and skills in entrepreneurship. Based on Arenius and Minniti (2005), they also argue that less educated individuals could be penalized by labor markets, which lead to necessity entrepreneurship. Thus, countries with higher levels of confidence in their skills could encourage entrepreneurship driven by opportunity. Bosma and Levie (2010) find that the perception of entrepreneurial opportunities and skills is higher in factor- and efficiency-driven economies than in innovation-driven economies. Additional evidence is provided by Manolova et al., (2008), who find that although some developing countries, such as Bulgaria, Hungary and Latvia, have higher levels of education, they also present lower rates of entrepreneurship due to low confidence and abilities to start new businesses. In part, this low confidence could be explained by their political and social transition. Concerning other types of developing countries, such as 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 (Alvarez and Urbano, 2011). Apart from the socio-economic context, people base their expectations on confidence, generally in their capacity to commercialize. Thus, the availability of entrepreneurial role models would stimulate other members to start a business. Therefore:

H2. *Confidence in one's skills has a positive influence on opportunity entrepreneurship.*

H2a. *Confidence in one's skills has a higher influence on opportunity entrepreneurship in Latin American countries than in all the countries in the sample.*

Regarding the formal factors, Gnyawali and Fogel (1994) find that governmental regulations, such as procedures, costs and taxes, among others, are generally perceived negatively by potential entrepreneurs. Some authors show that entrepreneurs may be discouraged from starting a business if they have to follow many rules and procedures (Alvarez and Urbano, 2011; Begley et al., 2005; van Stel et al., 2007). After the studies by Djankov et al. (2002) and van Stel et al. (2007),

empirical evidence about the negative effect of the number of procedures on entrepreneurial activity suggested new elements of entrepreneurship policies around the world. Taking this into consideration, the Doing Business project of the World Bank promotes the reduction of regulation, suggesting simple procedures to 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 (Alvarez and Urbano, 2011). Moreover, people with the appropriate capacity to start a new business driven by opportunity could be affected negatively in terms of discarding their business idea. According to Djankov et al. (2002) and Tanas and Audretsch (2011), higher regulation of entry is generally associated with greater corruption, less democratic governments without visible social benefits and a larger unofficial economy. In terms of policy implication, some governments and organizations focus their attention upon decreasing the entry "barriers" to the formation of new firms, especially those based on opportunity (Van Stel et al., 2007). Gnyawali and Fogel (1994) claim that this type of inefficiency caused by government regulation may be perceived negatively, especially by those interested in starting new businesses and innovative projects.

However, a comparison across countries may lead to different conclusions. For instance, Prantl and Spitz-Oener (2009) explore how entry regulation influences self-employment, and the results are relevant to emerging economies. They find that developed countries tend to have more regulations than developing countries, which at the same time have a greater effect on the entry to self-employment status. Thus, the effect of higher regulation reduces the intention to create new businesses in developed regions with respect to developing ones. Alvarez and Urbano (2011) suggest that Latin American countries have higher rates of unofficial economy than high-income countries. Consequently, several formalities and procedures for starting a business are avoided by entrepreneurs. Basically, in these countries, there is less social and legal pressure to enforce rules and regulations. In this sense, Alvarez and Urbano (2011) provide evidence that the number of procedures to start a business, although impacting negatively on entrepreneurial activity, have a smaller effect in developed economies. Accordingly, the following hypotheses are proposed:

H3. *The number of procedures involved in starting a business has a negative influence on opportunity entrepreneurship.*

H3a. *The number of procedures involved in starting a business has a lower influence on opportunity entrepreneurship in Latin American countries than in all the countries in the sample.*

As we mentioned earlier, Gnyawali and Fogel (1994) suggest another factor related to financial assistance, which is another important formal institution explored in entrepreneurship research. In that sense, van Auken (1999) finds that the financial structure presents an obstacle to the creation of new businesses. Here, individuals with no access to the financial system are not able to materialize their ideas, and therefore the entrepreneurial process is interrupted (van Auken, 1999). Hence, various challenges and impediments could hinder the creation of new SMEs as well as causing the high failure rates of new SMEs (von Broembsen et al., 2005). Several studies conclude that the promotion of entrepreneurship could focus on policies for increasing access to bank credit by lowering the capital requirements, the creation of investment companies, credit with low interest rates and credit guarantee schemes, among others (Alvarez and Urbano, 2011; Gnyawali and Fogel, 1994; van Gelderen et al., 2005). The consistence of these types of policies warrants not only the start-up process but also the sustainability capacity and the survival of the SME (von Broembsen et al., 2005). Black and Strahan (2002) find in the U.S. case that the rate of new start-ups increases following the deregulation of branching restrictions and also that deregulation reduces the negative effect of concentration on new start-ups. In addition, the access to credit must be equal in terms of gender in order to encourage entrepreneurial behavior in all nations (Marlow and Patton, 2005). Access to credit could also encourage the capacity to expand the firm or even focus the entrepreneurship on foreign markets. Huyghebaert et al., (2007) find that the presence of trade credit as well as new businesses focused on foreign markets urges new businesses to obtain this type of credit instead of bank credit. Therefore, more instruments of credit could imply more opportunities for entrepreneurship.

Regarding developing countries, Wang (2012) finds that some internal reforms in China led to reduced labor mobility costs and alleviated credit constraints in order to achieve higher rates of entrepreneurship. However, reforms in terms of credit access in developing countries require the removal of barriers to obtaining credit even more (Fatoki and Odeyemi, 2010). In that sense, Herrington et al. (2009) and Maas and Herrington (2006) claim that access to finance is a major problem for South African entrepreneurs. According to them, a lack of financial support is one of the main reasons for the low level of new firm creation as well as their failure in South Africa. Fatoki and Odeyemi (2010) argue that many entrepreneurs obtain financial support from their own or their family's savings, which are often inadequate, rather than approaching formal banks or other firms for external finance. Additionally, FinMark (2006) provides evidence that only 2% of new

SMEs in South Africa are able to access the financial system. Even worse, Balkenhol and Evans-Klock (2002) provide evidence that only 0.2% of entrepreneurs use trade credit in South Africa. This fact is discussed in a previous work by Stiglitz and Weiss (1981), who claim that agency problems, such as asymmetric information and moral hazards, which are suffered more in developing countries, can impact on the availability of credit and therefore the capital structure of new SMEs. According to these authors, this phenomenon could generate credit rationing. Due to these problems, they argue that the suppliers of finance choose higher interest rates, generating a supplier surplus in this market, meaning that it leaves a significant number of potential borrowers without access to credit. Concerning 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 their access to credit is also more difficult. Taking this into account, Alvarez and Urbano (2011) establish that although access to credit impacts positively on entrepreneurship, its impact on Latin American countries is lower with respect to other, developed countries. Therefore, the following hypotheses are proposed:

H4. *Access to bank credit has a positive influence on opportunity entrepreneurship.*

H4a. *Access to bank credit has a lower influence on opportunity entrepreneurship in Latin American countries than in all the countries in the sample.*

2.2 Opportunity entrepreneurship as an endogenous factor in economic growth

The traditional theory of economic growth relies upon physical capital and labor as driving factors to achieve economic growth (Solow, 1956; Swan, 1956). Following the evolution to the endogenous growth theory, many scholars emphasized the importance of the accumulation of knowledge in the process, and hence the creation of knowledge capital (Romer, 1986). Since this study, new variables have been included in the neo-classical model. Therefore, this new class of growth model recognizes some aspects of social factors that are also important in the generation of economic growth, which are influenced by the institutional settings (Acemoglu et al., 2014; Rodrik, 2005). Drawing on this literature, entrepreneurship could be an important factor in economic growth (Minniti and Lévesque, 2010), and therefore it should be encouraged where investment in social capital is higher (Amin, 2000; Simmie, 2003; Smith, 2003).

Authors such as Minniti and Lévesque (2010) and Colino et al. (2014), among others, have used this idea to include entrepreneurship into the growth model. They develop a mathematical

framework to demonstrate how entrepreneurship could lead to long-term equilibrium. Other studies, such as those by Audretsch and Keilbach (2004a,b, 2005, 2008), Bjørnskov and Foss (2013), Iyigun and Owen (1999) and Liñán and Fernandez-Serrano (2014), provide empirical evidence concerning the effect of entrepreneurship on economic growth. They assess entrepreneurship as a new input into the Solow–Swan model to find its weight in the growth process. Additionally, Carree et al. (2002, 2007) determine how disequilibrium in the entrepreneurship rate could affect growth in OECD countries.

Looking at the history of economic thought, this relationship between entrepreneurial decisions and economic growth is explored by Schumpeter (1934), who states that innovative entrepreneurs are capable of generating shocks in the economy, creating new and higher long-term equilibria. This author suggests that these innovations implemented within the markets lead to new path dependency and encourage new entrepreneurs in order to sustain the development process.

Thus, entrepreneurship and its possible effects generate research questions for many scholars from different disciplines (Thornton et al., 2011). According to Carlsson et al. (2013), one important reason to study entrepreneurship is that it is a factor that mediates the growth and development process. According to these authors, one stream of entrepreneurship research is dedicated to exploring those determinants that encourage this behavior. The previous subsection tried to explore the factors that explain entrepreneurship from the institutional approach. The second stream is related to the effects of entrepreneurship. Some authors, such as van Praag and Versloot (2007) and Wennekers and Thurik (1999), summarize those studies that empirically assess the effect of entrepreneurship on economic growth, job creation and innovation, respectively. The studies by Acs et al. (2012) and Audretsch and Keilbach (2008) suggest that specifically entrepreneurship based on knowledge impacts more on economic growth than other types of entrepreneurship without a knowledge base (e.g. necessity entrepreneurship). Authors such as Reynolds et al. (2005) suggest that entrepreneurship based on knowledge could be associated with the capacity to transform an opportunity into a real business, which has high value added. This entrepreneurial behavior is known as opportunity entrepreneurship (Reynolds et al., 2005). According to these authors, opportunity entrepreneurship can be considered as the result of individual decisions to create entrepreneurial initiatives based on knowledge. However, the question of the role of opportunity entrepreneurship in economic growth remains unanswered (Wong et al., 2005). The idea behind this question is the capacity to create new firms and to spark

knowledge in the society at the same time (Acs et al., 2012). Indeed, Acs et al. (2012) and Audretsch and Keilbach (2008) suggest that entrepreneurship could be a vehicle to transfer knowledge capacity and therefore generate spillover dynamics to obtain economic growth at the regional and national levels.

In contrast to Romer's (1986) idea, Acs et al. (2012) point out that knowledge may not be directly linked to economic growth, as it is assumed in the endogenous models. Therefore, authors such as Agarwal et al. (2007), Audretsch (2007), Audretsch and Keilbach (2008), Noseleit (2013), among others, have used opportunity entrepreneurship as a conduit of knowledge. In this sense, some authors recognize the capacities of potential entrepreneurial innovation and growth and their significant contribution to development (Acs and Armington, 2006; Audretsch, 2007; Levie and Autio, 2008; Schramm, 2006). According to Audretsch et al. (2008), entrepreneurs take knowledge based on opportunities in order to create new products. This guarantees a constant increasing of knowledge spillovers, which has a positive impact on economic performance (Audretsch et al., 2008). Furthermore, Audretsch et al. argue that innovative entrepreneurs who invest in the creation of new products based on new knowledge as a business opportunity can then take advantage with respect to other type entrepreneurs. Thereby, opportunity entrepreneurship is considered an important mechanism in the transformation of new knowledge into economic growth (Audretsch et al., 2008). Wong et al. (2005) have a similar conclusion, indicating that the opportunity entrepreneurship rates reflect the creation of knowledge and technology, which could impact positively on economic performance (Acs et al., 2012; Noseleit, 2013; Valliere and Peterson, 2009).

Distinguishing the impact of opportunity entrepreneurship on economic growth between groups of countries, little evidence is found in the literature. In general terms, although some authors assess this relationship regarding the importance of being located in developing or developed countries, they do not find any statistically significant results (Valliere and Peterson, 2009; Wong et al., 2005). These studies are based on the idea about the U-shaped form between entrepreneurship and economic growth: entrepreneurship decreases when national income per capita is higher (Carree et al., 2002, 2007). Following these authors, Valliere and Peterson (2009) and Wong et al. (2005) propose the hypotheses that countries with a higher level of opportunity entrepreneurship will achieve faster growth and emerging economies (which have higher necessity entrepreneurship rates) tend to grow slower. However, authors such as Hoskisson et al. (2000) and Tan (2002) suggest that those developing countries that encourage entrepreneurship based on

opportunity tend to be more sensible in terms of growth. These authors suggest that developing countries that focus on generating an appropriate environment for entrepreneurs tend to have positive and higher results in terms of employment, economic growth and development. They emphasize that to achieve these kinds of results it is important to provide permanent support in terms of institutional factors. In this sense, Acs et al., (2014, p. 487) provide evidence that some countries, such as Chile, Colombia and Puerto Rico, among others, could have a balance between entrepreneurship by opportunity and development, in which the national system of entrepreneurship plays an important role. These countries, for instance, are in the first 23 out of the 88 countries that belong to the overall rank according to their measure. These results are consistent with the impact of some endogenous factor on economic growth. For example, Dufrénot et al. (2010) provide empirical evidence about trade activity as a mechanism to encourage economic growth. Using quantile regression approach, they show that those countries with middle-low income tend to have higher coefficients than those countries with high-income level. Thus, is plausible expect that the coefficient associated with opportunity entrepreneurship has higher impact on economic growth. It could means, as Wennekers et al. (2005) suggest that opportunity TEA, for instance, contributes to lowering unemployment. According to Dejardin (2000), the more entrepreneurs by opportunity exist in an economy, the faster it will grow. Naudé (2010, 2011) argues that if the demand for opportunity entrepreneurship is higher in developing countries, as is normally expected, entrepreneurship is a more important factor in these countries. Thus, according to Dejardin (2000), countries with higher levels of opportunity entrepreneurship will experience better growth performance. Following the distinction by the United Nations, Latin American countries are classified as developing regions. Thus, we propose the following hypotheses:

H5. *Economic growth is influenced positively by opportunity entrepreneurship.*

H5a. *Economic growth is influenced positively by opportunity entrepreneurship but its impact is higher in Latin American countries.*

3. Data and methods

As we noted earlier, this paper explores the institutional factors that encourage opportunity entrepreneurship in order to achieve higher rates of economic growth, each of which influences the other. The specification of a simple production function assumes implicitly that entrepreneurship is exogenous. However, on the one hand, the inverse causal relationship is at work, i.e.

entrepreneurship and economic growth are linked recursively. On the other hand, as we argued above, entrepreneurship is also influenced by formal and informal institutional factors. Taking this into consideration, we specify the first equation in order to take this recursive structure explicitly into account as well as the other variables that affect entrepreneurship. In its general form, this equation is written as:

$$OE_{it} = f(II_{it}, FI_{it}, x_{it}) \qquad (1)$$

where II_{it} and FI_{it} are the vectors representing the informal and formal factors, respectively, and x_{it} is the controlling vector that influences opportunity entrepreneurship in country i at time t. The vector of control refers to the economic growth rate. The relationship between economic growth and entrepreneurship is not new and a feedback effect is thought to exist between the two. Although the body of research focuses mainly on the other direction, the impact of entrepreneurship on economic growth (Acs and Szerb, 2007; Audretsch et al., 2008; Mueller, 2007; Noseleit, 2013; Wennekers and Thurik, 1999), the opportunities for entrepreneurs that economic growth can provide are proved empirically by Galindo and Méndez (2014).

To specify the sequence of institutional factors, opportunity entrepreneurship and economic growth, an augmented production function that includes an explicit measure of opportunity entrepreneurship is estimated. On this basis, we are able to test the impact of both informal and formal institutions on opportunity entrepreneurship on the one hand and the impact of this last variable on economic growth on the other. The second equation is a Cobb–Douglas function of the form:

$$Y_{it} = \alpha OE_{it}^{\beta_1} K_{it}^{\beta_2} X_{it}^{\beta_3} LE_{it}^{\beta_4} GC_{it}^{\beta_5} L_{it}^{\beta_6}$$

Our endogenous growth model follows the Romer (1986, p. 1006) assumption about the labor coefficient (β_6) settled in one. This assumption implies that externalities are not internalized, knowledge is given (and expressed through opportunity entrepreneurship) and capital is foregone consumption. Taking this into account, and dividing output by labor in order to guarantee a function with constant returns to scale, we obtain:

$$Y_{it}/L_{it} = \alpha OE_{it}^{\beta_1} K_{it}^{\beta_2} X_{it}^{\beta_3} LE_{it}^{\beta_4} GC_{it}^{\beta_5} \quad (2)$$

where Y_{it} is the economic output of country i at time t, measured as the gross domestic product (GDP), L_{it} represents the total labor force (hence Y_{it}/L_{it} is labor productivity, a proxy for economic growth), OE_{it} represents its endowment of opportunity entrepreneurship, K_{it} is country i's endowment of capital, X_{it} is exports, LE_{it} represents the life expectancy and GC_{it} if the final

government consumption. Thus, this specifies formally that opportunity entrepreneurship contributes to the economic growth of countries. With equation (2), our approach is an extension of that chosen by Audretsch and Keilbach (2004a,b, 2005) and Audretsch et al. (2008), who emphasize that the impact of entrepreneurship on economic growth should take into account institutional factors; therefore, we focus on these two equations. Following the appendix of Wong et al. (2005) and Acs et al. (2012) to linearize the production function, we use the natural logarithm in the variables that represent institutional factors as well as the endowments assessed in our growth model. According to Wooldridge (2012, p. 44), the models using the logarithm on both sides (dependent and independent variables) allow a direct interpretation of their coefficients in terms of the percentage change in the independent variable implying a change in the dependent variable expressed in the respective coefficient. Therefore, we estimate this set of equations simultaneously using three-stage least-squares regression (3SLS) to correct for the simultaneity bias (e.g. Intriligator, Bodkin and Hsiao, 1996). Similar models were assessed through this technique into the field of entrepreneurship and economic growth, unveiling its importance to estimate models with bi-causality (Audretsch and Keilbach, 2008). According to Zellner and Theil (1962) and Wooldridge (2010) the advantage of 3SLS is asymptotically more efficient since it takes into account the correlation among the errors of each of the simultaneous equations of interest. The method also adjusts the weighting matrix for potential heteroskedasticity of the errors by estimating the coefficients within a Generalized Least Square (GLS) framework, an approach outlined by Wooldridge (2010).

Thus, we use unbalanced panel data for the period 2004–2012. Our first dependent variable, opportunity entrepreneurship, is the best-known indicator of the Global Entrepreneurship Monitor (GEM), which is measured through opportunity total entrepreneurial activity (TEA). Opportunity TEA shows those entrepreneurs who are motivated to pursue perceived business opportunities.

The second dependent variable is the economic performance indicator, obtained though the GDP constant at 2005 $US divided by the total labor force (L), which is one of the best-known proxies for economic growth. The sources of data to measure these dependent variables are the GEM and the World Development Indicator (WDI) of the World Bank.

The data on independent variables, specifically those that are informal and formal institutions, were obtained from the Worldwide Government Indicators (WGI; control of corruption), the GEM (confidence in one's skills) and Doing Business (the number of procedures

to start a new business and private coverage to obtain credit). Meanwhile, data on the economic growth rate were obtained from the World Development Indicators (WDI) database. In terms of the measure of each variable, control of corruption is a perception index that captures how the control of corruption is perceived in each country. This variable ranges between -2.5 (low control) and 2.5 (high control). For the purpose of this paper, this index was rescaled from 0 to 5. With respect to confidence in one's skills, this variable captures the percentage of members of the adult population who manifest confidence in their abilities and skills and who are involved in a new business; the number of procedures to start a new business measures the total number of procedures reported by the chamber of commerce in each economy; and private coverage to obtain credit measures the percentage of the adult population that has any credit with a private bank. Regarding the traditional variable assessed in a production function (Bleaney and Nishiyama, 2002) such as gross capital formation (K), exports (E), life expectancy at birth (LE) and the government consumption (GC), were obtained from the WDI. We use the natural logarithm to estimate the two equations.

Given that different datasets were combined, we could obtain a sample of 43 countries with a regular time series. Additionally to the importance of analyze our issue regarding Latin America countries, explained before, we find that our final database contains a representative sample of this homogeneous group. Table 1 presents a list of the dependent and independent variables used in this study, including their sources. Our final sample consists of panel data with 253 observations and 43 countries (see Annex 1).

Insert Table 1 about here

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4. Results and discussion

Table 2 reports the means, standard deviations and correlation coefficients of the variables used in this study. As table 2 shows, opportunity entrepreneurship is significantly correlated with confidence in one's skills and the economic growth rate. Furthermore, labor productivity, the proxy for economic growth, is significantly correlated with gross capital formation, exports, life expectancy and government consumption. The negative correlation between opportunity entrepreneurship and economic growth could be explained by development level. Some literature

highlights that opportunity entrepreneurship rates tend to be lower in less developed countries (Carree et al., 2002, 2007). Given the correlations among the independent variables, we test for the problem of multicollinearity of both equations through variance inflation factor (VIF) computations, which might affect the significance of the main parameters in the regressions. Although 3SLS does not allow the VIF to be obtained directly, we compute this test for each equation. The VIF values are low (lower than 1.55 for equation 1 and 1.20 for equation 2).

Insert Table 2 about here

Table 3 shows the results of linear regressions with robust variance estimates. We estimate Eq. 1 and Eq. 2 jointly, using OLS, 2SLS and 3SLS estimators as a robustness check. Model 1 considers the linear regression (OLS) with robust variance estimates of the two equations (opportunity TEA is a function of informal and formal factors, and labor productivity is a function of opportunity entrepreneurship and the other control variables), model 2 assesses both equation through 2SLS, while model 3 estimates the simultaneous equations using the method presented in the previous section (3SLS). Models 4, 5 and 6 estimate both equations simultaneously using dummies to control only Latin American countries through OLS, 2SLS and 3SLS, respectively. All the models are highly significant (p < .001) and have high explanatory power, explaining 69.5% of the variance in opportunity entrepreneurship and 79.5% of the variance in economic growth, respectively. In addition, we compute the Hausman test to compare the coefficients obtained with OLS, 2SLS and 3SLS. The Hausman specification test does not reject the null that the there are not systematic differences in coefficients of the 3SLS and 2SLS respect with the OLS estimation. These models estimated through 3SLS and 2SLS are well specified since the results are pretty much similar in both sign and economic significance, and both are different from the OLS. Here, the Hausman test results suggest we consider the 3SLS estimates for inference. Also, as Wooldridge (2010) states, OLS estimators are biased. Therefore, not reject the null hypothesis of Hausman test means that the expected value of the residuals tend to be zero, which implies good specification of the models (Baltagi, 2005, p. 127). The 3SLS estimators are consistent and asymptotically more efficient than single equation estimators (see that the standard errors of 3SLS are lower than OLS and 2SLS). Thus, 3SLS appears such appropriate technique to produce better results.

As mentioned before, through OLS model 1 analyzes the effect of informal (control of corruption and confidence in one's skills) and formal institutions (the number of procedures to start a business and private coverage to obtain credit) on entrepreneurial activity, controlling for the GDP growth rate (Eq. 1); and the relative importance of opportunity TEA on labor productivity (Eq. 2). The results indicate that the control of corruption, confidence in one's skills, the number of procedures to start a business and private coverage to obtain credit are highly significant and of the expected sign. This model explains 85.3% of the total variation in opportunity entrepreneurship. Regarding the link between TEA opp and economic growth, the estimation through OLS does not report any significance and marginal impact. The model explains 99.9% the total variance in economic growth. Similar to Model 1, the results found in Model 2 show that both informal and formal institutions are related with opportunity entrepreneurship; and the impact of this variable on economic growth is higher respect to Model 1, but does have any significant level. Model 2 explains 85.3 and 99.9% of the variation in opportunity entrepreneurship and economic growth, respectively. Model 3 assess simultaneously through 3SLS the institutional factors in opportunity entrepreneurship and its effect on economic growth. The results indicate that informal and formal institutions are highly significant and have the expected sign. Equation 1 of the model explains 85.2% of the total variation in opportunity entrepreneurship. At the same time, the estimated model shows that opportunity TEA has a positive and significant influence ($p < 0.1$) on economic growth and explains 99.9% of the variation in economic growth. Here it is important to highlight that informal institutions encourage opportunity entrepreneurship more to achieve economic growth. Finally, models 4, 5 and 6 assess through simultaneous equations (OLS, 2SLS and 3SLS, respectively) the institutional factors in opportunity entrepreneurship and its effect on economic growth, focusing on Latin American countries. Here, we include time fixed-effects to capture the business cycle of these countries. In contrast to the previous model, the results indicate that only one informal (confidence in one's skills) and both formal institutions are highly significant and have the expected sign and magnitude. Equation 1 in all models explains 70.2, 70.2 and 69.5% of the total variation in opportunity entrepreneurship. Meanwhile, Eq. 2 shows that opportunity TEA

has a positive and significant influence ($p < 0.01$) on economic growth and explains 81.7, 79.9 and 79.5%, respectively, of the variation in economic growth.

Concerning the hypotheses testing, hypothesis 1 proposes that control of corruption has a positive influence on opportunity entrepreneurship and hypothesis 1a suggests that control of corruption has a positive but lower influence on opportunity entrepreneurship in Latin American countries than in all the countries in the sample. Although Model 6 is not significant in this variable, the relationship is expected ($b = 0.140$). Meanwhile, Models 3 shows that control of corruption has a positive and significant influence on opportunity entrepreneurship in all countries ($b = 1.916$, $p < 0.01$). Therefore, hypotheses 1 and 1a are supported by the data. The results show a positive relationship between control of corruption and opportunity entrepreneurship, similar to the relationship found in previous studies (Aidis et al., 2008; Akimova, 2002; Alvarez and Urbano, 2011).

Hypothesis 2 suggests that confidence in one's skills has a positive influence on opportunity entrepreneurship. This hypothesis is supported by our data, in line with the literature; the presence of self-confidence in abilities and skills increases the rates of opportunity entrepreneurship (Estrin and Mickiewicz, 2012). Hypothesis 2a proposes that confidence in one's skills has a higher influence on entrepreneurship in Latin American countries than in all the countries in the sample. Models 3 and 6 show that confidence in one's skills has a positive and significant influence on opportunity entrepreneurship in all countries ($b = 0.554$, $p < 0.01$) and in Latin American countries ($b = 0.706$, $p < 0.01$). The results show that the confidence in one's skills coefficient in the Latin American model is higher than the coefficient in all countries, supporting hypothesis 2a. As it will be explained later, while in Latin American countries confidence in one's ability and skills is important for facilitating the entry of new firms by opportunity, in other countries business and entrepreneurial education is more relevant. Again, given the social context in Latin American countries, one of the elements characterizing the opportunity entrepreneurship in these countries is the capacity to believe and trust in their abilities and skills. This social intentionality could be seen reflected in higher rates of opportunity entrepreneurship, which at the same time could be synonymous with overcoming the internal problems.

Hypothesis 3 suggests that the procedures for starting a business have a negative influence on entrepreneurship. The coefficient in models 3 and 6 is negative and significant, supporting hypothesis 3; thus, fewer procedures for starting a business would be related to higher

entrepreneurial activity. In addition, hypothesis 3a proposes that the procedures for starting a business have a lower influence on opportunity entrepreneurship in Latin American countries than in all countries. The results in model 6 show that the coefficient is negative and significant, in contrast to Alvarez and Urbano (2011). Thus, our data support hypothesis 3a. Models 3 and 6 show that the number of procedures to start a business has a negative and significant influence on opportunity entrepreneurship in all countries (b = -0.352, p < 0.01) and in Latin American countries (b = -0.162, p < 0.05). This result is consistent with the paper by van Stel et al. (2007), who suggest that this type of regulation generates entry barriers, discouraging entrepreneurship behavior. In terms of Latin American countries, the lower influence of this variable on opportunity entrepreneurship could be due to the assumptions of the Doing Business project, which suggests that the reaction of entrepreneurs in these countries result from a high percentage of the members of the population being forced to start a business for their livelihood as part of the unofficial economy. In addition, the dynamic of the labor market (entry to and exit from employment or self-employment status) as well as the bureaucratic structure could lead to the creation of new businesses with a short survival period. Therefore, a governmental structure with policies focused on reducing the procedures that increase the entry cost is needed in Latin American countries.

Hypotheses 4 and 4a, which suggest that access to bank credit has a positive influence on entrepreneurship and that access to bank credit has a lower influence on entrepreneurship in Latin American countries than in all the countries in the sample, respectively, are supported by our results. Models 3 and 6 show a positive effect of access to bank credit on opportunity entrepreneurship in all countries (b = 0.182, p < 0.01) and in Latin American countries (b = 0.063, p < 0.01). According to the literature, this effect on Latin American countries is lower with respect to all the countries in the sample, meaning that the rest of the countries could have a more mature financial system, which provides support for entrepreneurs and SMEs. Concerning Latin American countries, the access to credit could be conditioned by internal problems, such as unemployment and underemployment, as Alvarez and Urbano (2011) suggest. This uncertainty caused by social conditions could generate distrust in the financial system, preventing its maturity, according to Stiglitz and Weiss (1981). Comparing our results with those of other papers, such as Alvarez and Urbano (2011), we obtain a consistent coefficient in our hypothesis and sub-hypothesis; meanwhile, they obtain a negative and statistically significant sign of credit access in Latin American countries. They argue their results based on Wennekers et al. (2005), who suggest that emerging economies

have higher rates of necessity entrepreneurship, which does not require large amounts of credit. Although this idea could be true, our results suggest even nowadays a lack of financial structure to support entrepreneurial ideas based on knowledge and innovation.

Hypothesis 5 proposes that economic growth is influenced positively by opportunity entrepreneurship. We find that opportunity entrepreneurship is positively related to economic growth ($\beta_1 = 0.037$, $p < 0.1$, in model 3). As we mentioned before, opportunity TEA defines a different characteristics in each country in terms of the innovation and knowledge based activities. According to Wong et al. (2005), entrepreneurial activity influenced by opportunities tends to affect positively on economic outcomes. Nevertheless, they do not find statistically significance evidence. In contrast, our results suggest that for each country in our sample, if opportunity TEA increases by 1%, the GDP per labor population will increase by 0.037% (model 3), ceteris paribus. This is in line of the Audretsch and Keilbach's (2004a) results. According to them, the entrepreneurship related with innovation has a positive impact on economic performance. Furthermore, we underline the effect of opportunity TEA on economic development does not differ significantly among these countries. This idea, supported by Valliere and Peterson (2009), suggests that those countries that encourage entrepreneurial activity based on innovation could achieve improved outcomes in terms of development. Therefore, our findings could suggest that entrepreneurship is a key factor in generating economic growth, on which institutional endowment is a factor that has a relevant influence through opportunity entrepreneurship. Furthermore, according to Braunerhjelm et al. (2010) and Mueller (2007), innovative entrepreneurs convert knowledge into socio-economically relevant knowledge; therefore, spillovers could be accomplished across the societies to increase economic development.

Hypothesis 5a proposes that economic growth is influenced positively by opportunity entrepreneurship but its impact is higher in Latin American countries. We find that opportunity entrepreneurship is positively related to economic growth in Latin American countries ($\beta_1 = 0.620$, $p < 0.01$, in model 6). The study by Wennekers et al. (2005) shows that there appears to be a U-shaped relationship between the level of economic development and the rate of entrepreneurship. The study by van Stel et al. (2005) shows that entrepreneurial activity has a positive effect on economic growth in highly developed countries but a negative effect in developing countries, similar to Blanchflower (2000), who finds a negative relationship between entrepreneurship and economic growth in developed countries. Although Wennekers et al. (2005) find that developing

countries tend to have more necessity entrepreneurship, and hence a U-shaped form could exist, our results in contrast suggest that for each country in the Latin American group, if opportunity TEA increases by 1% across time, the labor productivity will increase by 0.620%, ceteris paribus. According to Dejardin (2000), high levels of the entrepreneurial activity rate are associated with high rates of economic growth, which tend to be higher in developing countries. These results could be explained by opportunity entrepreneurship creating jobs, new economic outcomes and adding value. Thus, a higher degree of opportunity entrepreneurship could assure economic performance and faster rates of economic growth, especially in those Latin America countries with a high unemployment rate and unofficial economy; hence, entrepreneurship could result as an important mechanism to reduce them.

The discussion and analysis of these results in terms of policy implications concern both models assessed simultaneously. Our results provide empirical evidence regarding the scheme proposed by Reynolds et al. (2005, p. 206), who suggest that entrepreneurial opportunities depend on the sociocultural and political context, and its effects are reflected in economic growth. Based on the theoretical framework used in this paper, these sociocultural factors and political context could be associated with formal and informal institutions. In this sense, Reynolds et al. (2005) suggest that to achieve the appropriate opportunity entrepreneurship to help to increase the economic growth, it is important to have equalized institutions that foster entrepreneurial behavior. This accurate external context could guarantee the endowment of entrepreneurship required for economic growth. Given our results, the governments should be in line with the entrepreneurial intentions of individuals, as well as encouraging the permanent pursuit of opportunities in order to transform them into new businesses. For instance, for our entire sample, control of corruption as well as confidence in one's skills are fundamental to generating incentives in terms of opportunity entrepreneurship, which at the same time impact positively on economic growth. Additionally, the financial system is crucial to provide sufficient tools needed by entrepreneurs. Greater coverage of private credit implies more opportunity entrepreneurship, as our results suggest. Concerning the number of procedures to start a business, all the governments in our sample should find an appropriate match between the capacity of regulation in terms of procedures and maintaining the incentives to start a business. This is a particular issue in Latin American countries, which have higher levels of unofficial economy. According to our results, while the number of procedures is increasing, the rate of opportunity entrepreneurship tends to be lower. Although the impact of this

variable on opportunity entrepreneurship is higher in all the countries in our sample than only in Latin American countries, the consideration of these emerging economies should be in terms of assuring higher levels of the official economy as well.

Therefore, an ecosystem of entrepreneurship is required within each country in order to motivate the permanent generation of ideas (Acs et al., 2014). According to these authors, every government at the regional and the national levels should pay attention to the systems of entrepreneurship, which are fundamentally networks that are driven by individual-level opportunity pursuit, allowing the creation of new firms. This entrepreneurial infrastructure and its outcomes should be regulated by country-specific institutional characteristics in order to achieve higher outcomes in terms of growth and welfare. It means that governments, the education system, the financial infrastructure, the productive sectors and the civil society must constantly interact to achieve better performance in terms of increasing the number of entrepreneurs by opportunity and hence achieving higher levels of inclusive economic growth. In this sense, Acs et al. (2014) propose an index of national systems of entrepreneurship, which contains the capacity to identify the components that compose the systems, the factors that discourage their performance and the contextualization in which the entrepreneurial systems are embedded. The authors suggest that the national systems of entrepreneurship could complement the national systems of innovation. In that sense, it is possible figure out a loop between innovative ideas based on knowledge and their subsequent transformation into a new venture. Whether or not the respective institutions support each system accurately, the permanent generation of ideas as well as the creation of new businesses could lead to social benefits in terms of growth, employment and competitiveness, among others.

Through the index of national systems of entrepreneurship, Acs et al. (2014) provide some evidence across countries in terms of the balance between entrepreneurship and economic development. According to their results, a higher level of entrepreneurship or income does not mean a perfect combination. They suggest that the optimal result depends on institutional settings that are in harmony with the societal characteristics and needs. They classify the countries according to the index result. Surprisingly, some developing countries, such as Chile, Colombia, Puerto Rico and Uruguay, among others, appear in the top 35 out of the 88 countries analyzed in their sample. Although they emphasize the top position of developed countries in the rank, they find that in some countries (in this case, emerging economies), working harder could achieve the level of entrepreneurship that guarantees higher and sustainable economic growth. Analyzing these

results under the lens of institutional variables utilized by Acs et al. (2014), the main challenge of this type of country is to overcome the high level of corruption, improve the tertiary education and business skills and assure access to the financial system, among others. In this sense, our results support the same ideas in terms of their importance to foster the appropriate entrepreneurship and therefore the economic growth.

Special attention to the national entrepreneurship system in Latin American countries should also be focused on strategies for the science, technology and innovation (STI) system. According to Acs et al. (2014), policies concerning the permanent generation of ideas through the STI infrastructure encourage individuals to explore, evaluate and create start-ups with high potential to survive. These new ventures could help the competitiveness, growth and development of regions and countries. According to Padilla-Pérez and Gaudin (2014), some Central American countries have focused some policies on the infrastructure in order to promote interactions into their innovation systems. Thus, the sensibility of economic growth caused by the dynamics in innovation and opportunity entrepreneurship could be higher in Latin American countries given their capacity to reduce the unemployment, increase the markets, generate interactions among regions and enhance the competitiveness. In addition, the challenge in Latin American countries is to increase the proportion of opportunity entrepreneurship with respect to necessity entrepreneurship. This could be made possible by facilitating the engaging of the society in the productive system, which implies general education and specific skills, and even more importantly, providing confidence to all entrepreneurs based on their own knowledge instead of pointing out cases of failure (Stephens and Partridge, 2011). Our results suggest that confidence in one's skills is positive and higher in Latin American countries, implying that the capacity to provide all the support (governmental, infrastructure, financial system, education, among others) required by entrepreneurs raises their confidence and leads them to achieve prosperous new businesses.

Furthermore, Padilla-Pérez and Gaudin (2014, p. 757) found that the lack of financial structure to support entrepreneurial ideas based on opportunities is a barrier to accomplish an efficient results in terms of science, technology and innovation process in Central American countries. Similarly to Fatoki and Odeyemi (2010), who present results regarding African countries, the authors suggest expanding financial aid to all entrepreneurs, and especially to those who are based on knowledge. All the elements discussed above, combined with wide coverage of private credit, could guarantee an increasing number of innovative entrepreneurs with a high likelihood of

success, who could pay back the loans at their respective interest rate, assuring the balance in the financial system again. In that sense, the access to credit should be focused on providing support to evaluate new ideas, the growth and development of SMEs, innovative projects in firms and the possibility to explore new local and foreign markets.

Summarizing, for both developed and Latin American countries, the governmental structure must be designed in terms of solving the agency problems. This means always moving toward the social needs and encouraging productive behavior. Here, entrepreneurship could be affected positively by accurate public sector strategies. For example, a lower level of corruption benefits all society in terms of prompting greater trust in the state and raising the number of new entrepreneurs supported by alliances between the educational system and governmental policies and established firms. These alliances could guarantee that the next generation of entrepreneurs has more ideas based on knowledge and opportunity perception, whose market could be assured in part through established firms, which pull new ventures through orders that engage their activity with the services and products offered by new firms. On the governmental side, a low level of corruption and low regulation, such as the procedures to start a business, have a twofold effect. On the one hand, the rate of new business creation increases notably, which could foster firms with survival capability, and on the other hand, the societal benefits could be considered in terms of increased tax payments by entrepreneurs and their employees (encouraging the transition to the official economy), the final result of which could be reflected in the competitive infrastructure. These possible benefits again impact positively on those entrepreneurs who perceive opportunities, who could have more confidence in themselves, in the system and in the structure provide by their state. Thus, informal factors, such those assessed in this paper, encourage opportunity entrepreneurship much more, at the same time allowing the achievement of higher economic growth. For Latin American countries, this possible loop generates even more positive results due to the impact of opportunity entrepreneurship on their economic growth.

5. Conclusions

In this paper, unbalanced longitudinal panel data (for the period 2004–2012) were used to investigate empirically the simultaneous effect of institutional factors on opportunity entrepreneurship and this variable on economic growth, which also allows overcome the

endogenity problem. Using a conceptual framework of institutional economics, we analyzed the influence of informal (control of corruption and confidence in one's skills) and formal institutions (the number of procedures involved in starting a business and private coverage to obtain credit) on opportunity entrepreneurship, which at the same time allow the achievement of economic growth. We also considered this simultaneity in Latin American countries. Here, even for all the countries in the sample and Latin American countries, informal institutions present a greater influence on opportunity entrepreneurship than formal ones, meaning, at the same time, more economic growth.

The research generated three key results. First, there is evidence of a positive relationship between institutional factors and opportunity entrepreneurship. This follows the recent results of entrepreneurship research, which suggest that institutions play a key role in explaining entrepreneurial activity, especially that driven by opportunity (Álvarez et al., 2014). In addition, our results support the idea that informal factors have a greater impact on opportunity entrepreneurship than formal institutions, as Thornton et al. (2011) suggest. Second, we found a positive relationship between opportunity TEA and economic growth. Here, entrepreneurial activity based on opportunities encourages economic growth. These results suggest that opportunity entrepreneurship could be a key factor in achieving economic growth. Furthermore, it is important that policy makers redefine the strategies to encourage this type of entrepreneurship in each country. In terms of long-run growth, strategies related to entrepreneurship motivated by the exploration and evaluation of opportunities are important. Otherwise, entrepreneurial activity motivated by necessity could solve short-run problems, but have no effect on long-run economic growth. Third, joining the two sides of entrepreneurship research discussed by Carlsson et al. (2013), it is possible to suggest that informal institutions measured through the control of corruption and confidence in one's skills encourage the entrepreneurship required to foster economic growth. Here, theoretical and policy implications could be derived, concerning the institutional factors, especially informal ones, that affect economic growth (North, 1990) throughout entrepreneurship.

Regarding the Latin American countries, the social context could be improved through the promotion of opportunity entrepreneurship. This promotion could be fostered through informal factors, such as the confidence in their skills to set up a new business guided by the opportunity perception. Thus, higher levels of opportunity entrepreneurship lead to economic growth. Job creation could be obtained, as well as formal economy. Thus, it is possible to suggest additional

elements to the policy implications, which could be plausible to obtain economic growth through encouraging the appropriate institutions in order to increase the opportunity entrepreneurship. Additionally, some theoretical issues could be discussed in terms of the importance of institutions such framework to understand determinants and effects of opportunity entrepreneurship.

Finally, some limitations regarding the sample size (especially for Latin American countries), and the static analysis are detected. Other datasets could provide a higher sample for both heterogeneous as well as specific group of countries, which allow obtain more precise estimators by analyzing also dynamic effects. Additionally, by exploring new data, it could be possible increase the amount of instruments for the simultaneous analysis. The idea that the more instruments should be considered, it encourages the possibility to extend the objective presented in this paper, by exploring and including additional institutional factors into the opportunity entrepreneurship equation. Similarly, the empirical evidence provided by this paper opens new avenues in terms of which other institutions affect the entrepreneurship driven by opportunity that allows enhanced economic growth. In that sense, it is possible to follow the studies by Alvarez and Urbano (2012), Urbano and Alvarez (2014) and van Hemmen et al. (2013), in order to analyze how the institutions assessed in these papers could also encourage entrepreneurial behavior and therefore obtain higher economic growth rates. The main challenge is to find the appropriate data at the country level that allow the simultaneous evaluation of the effect of institutions on entrepreneurship and its subsequent impact on economic growth, regarding also dynamic analysis.

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Insert Annex 1 about here

Table 1. Description of the variables

Equation 1		
Dependent variable	**Description**	**Source[a]**
Opportunity Entrepreneurship	Percentage of those involved in TEA (Total Entrepreneurial Activity) who (i) claim to be driven by opportunity as opposed to finding no other option for work; and (ii) who indicate the main driver for being involved in this opportunity is being independent or increasing their income, rather than just maintaining their income	GEM for the period 2004 to 2012
Independent variable	**Description**	**Source**
Informal institutions		
Control of corruption	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 for the period 2004 to 2012
Confidence in one's skills	Percentaje of Individuals who answer whether they believed to have the knowledge, skill and experience required to start a new business.	GEM for the period 2004 to 2012
Formal institutions		
Number of procedures to start a new business	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 for the period 2004 to 2012
Private coverage to getting credit	Percentaje of adult population that has a least one credit by private bank.	Doing Business for the period 2004 to 2012
Control variable		
Economic growth rate	GDP growth at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in constant 2005 U.S. dollars per capita.	WDI for the period 2004 to 2012
Equation 2		
Dependent variable	**Description**	**Source**

Labor productivity (Y/L)	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in constant 2005 U.S. dollars. This variable is divided by the number of a country's population that is employed.	WDI for the period 2004 to 2012

Independent variable	Description	Source
TEA Opportunity	Percentage of those involved in TEA (Total Entrepreneurial Activity) who (i) claim to be driven by opportunity as opposed to finding no other option for work; and (ii) who indicate the main driver for being involved in this opportunity is being independent or increasing their income, rather than just maintaining their income	GEM for the period 2004 to 2012
Capital	Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Data are in constant 2005 U.S. dollars.	WDI for the period 2004 to 2012
Exports	It represent the value of all goods and other market services provided to the rest of the world. (% of GDP).	WDI for the period 2004 to 2012
Life expectancy	Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.	WDI for the period 2004 to 2012
Government consumption	Final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees).	WDI for the period 2004 to 2012

[a] Doing Business. http://www.doingbusiness.org/; GEM. Global Entrepreneurship Monitor (GEM). http://www.gemconsortium.org/; WDI. World Development Indicators (WDI) by World Bank. http://databank.worldbank.org/data/home.aspx; WGI. Worldwide Governance Indicators (WGI) by World Bank. http://info.worldbank.org/governance/wgi/index.asp.

Table 2. Descriptive statistics and correlation matrix

Variable	All countries		Latin American countries	
	Mean	Std. Dev.	Mean	Std. Dev.
1.Ln Labor productivity	10.409	0.982	9.304	0.395
2. Ln TEA opp	1.687	0.558	2.391	0.379
3. Ln Control of corruption	1.172	0.330	0.982	0.259
4. Ln Confidence in one's skills	3.753	0.372	4.136	0.124
5. Ln number procedures to start a business	1.911	0.451	2.287	0.316
6. Ln private coverage to getting credit	3.677	1.010	3.769	0.549
7. GDP growth	2.307	3.900	5.084	2.744
8. Ln Capital	25.086	1.627	24.230	1.369
9. Ln Exports	3.530	0.553	3.217	0.462
10. Ln Life expectancy	4.343	0.078	4.315	0.034

	2.870	0.301	2.597	0.256	
11. Ln Government consumption	2.870	0.301	2.597	0.256	

	1	2	3	4	5
1.Ln Labor productivity	1				
2. Ln TEA opp	-0.365*	1			
3. Ln Control of corruption	0.842*	-0.135*	1		
4. Ln Confidence in one's skills	-0.291*	0.646*	-0.129*	1	
5. Ln number procedures to start a business	-0.506*	0.125*	-0.528*	0.187*	1
6. Ln private coverage to getting credit	0.305*	0.102	0.265*	0.019	-0.025
7. GDP growth	-0.322*	0.281*	-0.179*	0.099	0.171*
8. Ln Capital	0.318*	-0.214*	0.119*	-0.326*	0.098
9. Ln Exports	0.197*	-0.159*	0.257*	-0.103*	-0.458*
10. Ln Life expectancy	0.675*	-0.194*	0.645*	-0.133*	-0.204*
11. Ln Government consumption	0.565*	-0.393*	0.433*	-0.221*	-0.223*

	6	7	8	9	10
6. Ln private coverage to getting credit	1				
7. GDP growth	-0.034	1			
8. Ln Capital	0.213*	-0.042	1		
9. Ln Exports	-0.039	-0.030	-0.419*	1	
10. Ln Life expectancy	0.303*	-0.218*	0.230*	0.131*	1
11. Ln Government consumption	0.148*	-0.361*	0.158*	0.055	0.279*

* $p < 0.1$.

Table 3. Estimating opportunity entrepreneurship and economic growth

	(1)	(2)	(3)	(4)	(5)	(6)
Equation 1. Dep. variable TEA opp	Ln TEA opp all countries (OLS)	Ln TEA opp all countries (2SLS)	Ln TEA opp all countries (3SLS)	Ln TEA opp Latin American countries (OLS)	Ln TEA opp Latin American countries (2SLS)	Ln TEA opp Latin American countries (3SLS)
Informal factors						
Ln Control of corruption	1.525**	1.525**	1.916***	0.049	0.049	0.140
	(0.604)	(0.604)	(0.507)	(0.101)	(0.101)	(0.092)
Ln Confidence in one's skills	0.606***	0.606***	0.554***	0.752***	0.752***	0.706***
	(0.147)	(0.147)	(0.125)	(0.073)	(0.073)	(0.068)
Formal factors						
Ln number procedures to start a business	-0.273**	-0.273**	-0.352***	-0.136*	-0.136*	-0.162**
	(0.133)	(0.133)	(0.110)	(0.076)	(0.076)	(0.069)
Ln private coverage to getting credit	0.199***	0.199***	0.182***	0.057**	0.057**	0.063***
	(0.075)	(0.075)	(0.062)	(0.025)	(0.025)	(0.023)
Control variable						
GDP growth rate	0.002	0.002	0.001	0.029***	0.029***	0.029***
	(0.007)	(0.007)	(0.006)	(0.010)	(0.010)	(0.009)
Constant	-3.168***	-3.168***	-3.390***	-1.326***	-1.326***	-1.212***
	(1.206)	(1.206)	(1.031)	(0.378)	(0.378)	(0.347)
R2	0.853	0.853	0.852	0.702	0.702	0.695
Equation 2. Dep. variable Y/L	Ln Y/L all countries	Ln Y/L all countries	Ln Y/L all countries	Ln Y/L Latin American countries	Ln Y/L Latin American countries	Ln Y/L Latin American countries
Ln TEA opp	0.000	0.038	0.037*	0.258***	0.594***	0.620***
	(0.009)	(0.023)	(0.020)	(0.078)	(0.118)	(0.113)
Control variable						
Ln Capital	0.192***	0.182***	0.188***	0.136***	0.155***	0.140***
	(0.015)	(0.017)	(0.014)	(0.029)	(0.031)	(0.029)
Ln Exports	0.065**	0.043	0.066**	0.138*	0.144*	0.109

	(0.030)	(0.035)	(0.029)	(0.075)	(0.078)	(0.073)
Ln Life expectancy	0.738**	0.450	0.603**	5.362***	5.469***	5.318***
	(0.308)	(0.364)	(0.304)	(0.419)	(0.441)	(0.413)
Ln Government consumption	0.055	0.067	0.054	1.139***	1.188***	1.129***
	(0.051)	(0.054)	(0.045)	(0.122)	(0.129)	(0.120)
Constant	2.489**	3.986**	3.128**	-20.245***	-21.883***	-20.600***
	(1.235)	(1.556)	(1.305)	(1.741)	(1.874)	(1.776)
Time fixed-effects	No	No	No	Yes	Yes	Yes
N	197	197	197	197	197	197
R2	0.999	0.999	0.999	0.817	0.799	0.795
Hausman Specification Tests						
2SLS vs. OLS		0.000			0.000	
3SLS vs. OLS		1.000			0.257	
3SLS vs. 2SLS		1.000			0.257	

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Note: Heteroskedasticity corrected standard errors are shown in parentheses. Estimates for country and time fixed-effects dummies are not presented but can be supplied upon request.

Annex 1. List of countries

Country	Latin American countries
1 Australia	
2 Belgium	
3 Bosnia and Herzegovina	
4 Brazil	X
5 Chile	X
6 China	
7 Colombia	X
8 Croatia	
9 Denmark	
10 Finland	
11 France	
12 Germany	
13 Greece	
14 Guatemala	X
15 Hungary	
16 Iceland	
17 Ireland	
18 Italy	
19 Japan	
20 Korea	
21 Latvia	
22 Malaysia	
23 Mexico	X
24 Netherlands	
25 Nigeria	
26 Norway	
27 Pakistan	
28 Panama	X
29 Peru	X
30 Poland	
31 Portugal	
32 Romania	
33 Russian Federation	
34 Singapore	
35 Slovenia	
36 South Africa	
37 Spain	
38 Sweden	
39 Switzerland	
40 Thailand	

	Country	Latin American countries
41	United Kingdom	
42	United States	
43	Uruguay	X