

Formal institutions, informal institutions and entrepreneurial activity: A comparative relationship between rural and urban areas in Colombia



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ABSTRACT

The study of the impact of institutions on entrepreneurship has been a topic of great interest in recent years. Nevertheless, less attention has been paid to the relation that can exist between the spatial context and the entrepreneurial activities. Specifically, institutions and the space of entrepreneurial activities in a country have rarely been considered as a whole. This paper attempts to bridge the gap between these two aspects and seeks to examine the entrepreneurial activity in rural areas in comparison with urban areas based on the formal and informal institutions in an emerging economy such as Colombia. It claims that the formal institutions affect rural and urban entrepreneurs differently, examining the moderating effect of the informal institutions on this relation. Using a hierarchical logic model with panel data, 30 cities in Colombia over the period 2000–2013 are used as samples to explore the differences between rural and urban areas. It is found that the informal institutions achieve greater influence in the rural areas; these areas are favored to a greater extent by the social norms, since they are smaller territories with greater integration between citizens. However, the existence of subjective and objective insecurity affects rural entrepreneurial activity in a wider scope than urban entrepreneurial activity, decreasing the creation of new ventures.

1. Introduction

The study of entrepreneurship has gained greater recognition and attention from governments and policy makers given that it is considered as a fundamental aspect of the economic development of a country. Thus, many scholars have become interested in understanding and analyzing the elements that encourage entrepreneurship. According to these authors, institutional theory is employed to explain the increase in entrepreneurial behavior, proposing that an institutional structure is required to promote the creation and development of new ventures (Acemoglu & Robinson, 2008; Aparicio, Urbano, & Audretsch, 2016; Bjornskov & Foss, 2013; Hoskisson, Eden, Lau, & Wright, 2000; Muralidharan & Pathak, 2017; Salimath & Cullen, 2010). The role of institutions in

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entrepreneurial activity has been based on arguments that are focused on formal institutions, like the regulatory framework, which provides an explanation of the variability of a nation's entrepreneurship (Shane, 2000; [Levie & Autio, 2008](#); [Stephan & Uhlaner, 2010](#); [Kautonen, Gelderen, & Fink, 2013](#); [Van Gelderen, Kautonen, & Fink, 2015](#)), and informal institutions, such as culture and social structures, which affect the entrepreneurial motivation ([Aparicio et al., 2016](#); [Autio, Pathak, & Wennberg, 2013](#); [Muralidharan & Pathak, 2017](#); [Uhlaner & Thurik, 2007](#)).

Most of these studies have considered both formal and informal institutional characteristics and their effects on the creation of new ventures among countries, though they have paid less attention to the relation that can exist between the spatial context and the entrepreneurial activities. The research has been limited particularly to the direct relationships between institutional factors and entrepreneurship in countries, leaving aside the interactive effects of institutional factors when the spatial context is rural ([Korsgaard, Müller, & Tanvig, 2015](#)). In general, all forms of entrepreneurship have a spatial dimension; they tend to be located in the places with the strongest economic incentives regarding land, workforce, infrastructure and other aspects ([Pallares-Barbera, Tulla, & Vera, 2004](#)). Rural spaces offer different incentives for entrepreneurs, because they are considered as spaces of production, where farming is the prevalent economic activity, and for years entrepreneurial farming has played an important role in the industrialization of farm production ([Niska, Vesala, & Vesala, 2012](#)). With respect to entrepreneurship, rural areas are more limited than urban areas. Rural entrepreneurship faces multiple restraints, for instance a lack of human or financial capital and weak communication and knowledge infrastructure ([Korsgaard et al., 2015](#)). As a result, the role of institutions in the creation of new ventures in rural areas differs from that in urban areas ([Vesala & Vesala, 2010](#)). In addition, the typical location of rural new ventures makes the social norms established by the communities act on the entrepreneurial activity ([Stenholm & Hytti, 2014](#)).

Consequently, a line of research has analyzed the special context of entrepreneurship ([Korsgaard et al., 2015](#)), emphasizing the importance of rural entrepreneurship, whereas another line has investigated the impact of institutions on entrepreneurship in general ([Aidis, Estrin, & Mickiewicz, 2008](#); [Muralidharan & Pathak, 2017](#)) or on rural entrepreneurship ([Meccheri & Pelloni, 2006](#); [Stenholm & Hytti, 2014](#)). However, the two lines of research have rarely been analyzed at the same time or at the same level. To address this gap, the current study incorporates all three elements: the spatial context (rural and urban areas), entrepreneurship and institutions. We approach this research gap by examining the moderating effect of informal institutions on the relationship between formal institutions and entrepreneurial activity, taking into account the fact that the institutional context in a country tends to differ between urban and rural areas.

Moreover, we focus on analyzing the informal institutions, subjective insecurity and social norms as moderators of the relationship between objective insecurity, procedures for starting a business and entrepreneurial activity. This analysis contributes to complementing the findings of previous research, demonstrating that the effects of the regulatory structure on entrepreneurship are sensitive to informal institutional factors and that these effects may vary according to the spatial context—rural or urban entrepreneurship.

To test our hypotheses, we develop a logistic regression model with panel data. Using this model, we provide empirical evidence about the moderating effects of informal institutions on the relationship between formal institutions and entrepreneurial activity, focusing on rural and urban areas of Colombia. Additionally, we take into account the dynamics and contexts in these two sectors within the role of institutions and the situations of conflict and violence that frame the different conditions that urban and rural entrepreneurs can face. Specifically, we use a data panel for rural and urban regions in Colombia in the period between 2000 and 2013 from the Global Entrepreneurship Monitor (GEM), the World Bank and the Colombian database of the CEDE (Center for Studies on Economic Development). By analyzing these data through the model, we provide empirical evidence with respect to the informal institutions and their incidence and effect on the relationship between formal institutions and entrepreneurial activity in the rural areas in Colombia.

The outline of the paper is as follows. In the theory section, we present an overview of the differences between rural and urban entrepreneurship and the theoretical concepts and previous research that are used to explain the relation between institutions and entrepreneurial activity, describing the types of formal and informal institutions and the hypotheses raised concerning them. This is followed by a description of the data collection and methodology. The results are presented in the next section. Finally, in the conclusion, we discuss the findings, limitations and future lines of research.

2. Theoretical framework and research hypotheses

2.1. Rural entrepreneurship and institutions: conceptual framework

Referring to the spatial context and its effect on social processes leads to the definition of space as the network that connects different places, containing capital flows, labor, resources and knowledge ([Hudson, 2010](#); [Korsgaard et al., 2015](#)). This flow between the different places that define space has been increasing, causing some places to present greater growth than others. This is the case of urban areas, where the greatest accumulation of capital, labor, resources and knowledge has taken place ([Johnstone & Lionais, 2004](#)). This movement has created a concern around profit maximization and the generation of economic value in companies, countries and regions, especially due to the fact that accumulation in cities has caused the desertion of the perimeter. On the other hand, in rural areas, there are plenty of limitations to the development of entrepreneurship and economic growth; the weaknesses in these areas reside in the lack of accessibility and the low population density, which result in high costs for accessing markets ([Schnell, Greenberg, Arnon, & Shamai, 2017](#)). Although these areas have high potential, the production is largely motivated by self-sufficiency, which serves local needs ([Dabson, 2001](#)). Nevertheless, this motivation may vary according to industry and geography ([Henderson, 2002](#), pp. 45–70). Some industries provide more opportunities for new businesses because they produce a wider range of products, allowing producers to find different markets for them ([Malecki, 1994](#)).

Thus, entrepreneurship is explored as a process that is influenced by its spatial, rural or urban context, which, from a functional perspective, is not seen as an activity or process that extends beyond the connection between individuals and companies. However, it implies an activity in which diverse actors of the market participate (Foss & Klein, 2012). In this way, rural entrepreneurship is defined as the entrepreneurial activity committed to its spatial context that implies the use of new resource combinations to create value for both the entrepreneur and the location (Korsgaard et al., 2015). This regards commitment to the rural place, where, unlike the entrepreneurship in cities, concerns are dedicated not only to economic benefits but to the conservation of the social meaning of the place (Lewis, 2008; Müller & Korsgaard, 2014). Furthermore, rural space offers entrepreneurship diverse opportunities considering the advantages of location, which favor access to natural resources (Müller, 2013). In particular, rural entrepreneurship takes advantage of the place, creating a space in which, apart from enabling firms to obtain profits, permits the development of new organizational systems that contribute to local improvement (Johnstone & Lionais, 2004). In this sense, the rural areas in the center differ from those in the periphery (Schnell et al., 2017). In the center, the rural areas have higher population density and the markets are closer to each other and have greater diversification of economic activities. On the contrary, the rural areas in the periphery have distant markets, low population rates, precarious infrastructure and a high level of dependence on agricultural activities for economic growth (Schnell et al., 2017). Besides, another constraint in the development of rural areas relates to the large quantity of small firms, with a lack of access to financial resources and technology and lower levels of human capital (Dabson, 2001).

In conclusion, rural entrepreneurs are in need of assistance to address these constraints. This assistance is associated with and promoted by means of public policies (OECD, 1998). Nevertheless, these policies are not usually proposed equitably for companies in rural and urban areas. Hence, considering that entrepreneurial companies play such an important role in regional growth, it is worth discussing whether this is the case for companies in rural areas, which must overcome certain disadvantages in relation to companies in urban areas (Bosma, van Stel, & Suddle, 2007). It is for this reason that entrepreneurial activity in rural and urban areas is analyzed comparatively in this article, examining the context from the institutional theory through the study of the institutions in the entrepreneurial activity for both areas as well as taking into account the fact that the capitalist system shows strong dependence on the state in urban areas. The analysis of entrepreneurship from the institutional theory is one of the approaches addressed by various authors who have focused on studying entrepreneurship and the factors that affect its formation (Kautonen et al., 2013; Krueger, 1993, 2007; Levie & Autio, 2008; Van Gelderen et al., 2015). One of these approaches includes institutional theory as a theoretical framework to analyze entrepreneurship, suggesting that the institutional determinants of a society affect the rules of the game within which an entrepreneur must operate as well as the conditions to identify them (North, 1994).

North (1990, p. 3) defined institutions as “the rules of the game in a society, or more formally, restrictions that configure human interaction.” The institutional approach allows us to understand how institutions are correlated with entrepreneurial activity and which institutions have the greatest impact (Veciana & Urbano, 2008). The institutional factors that exert an impact entrepreneurship are classified into formal and informal factors. According to North (1990), formal institutions consider the political, legal and economic systems, and others, that are established by the government to regulate individuals' behavior (property rights, contracts, procedures, political structure, etc.) and to reduce the transaction costs to enhance the market performance. Therefore, Djankov, La Porta, Lopez-De-Salines, and Shleifer (2002) pointed out that these formal institutions can help to remove market imperfections. Different studies have explored distinct measures of formal institutions, for example procedures related to stock markets (Bruton, Ahlstrom, & Puky, 2009), financial systems (Klapper, Laeven, & Rajan, 2006), hiring and firing policies (Goltz, Buche, & Pathak, 2015), the political structure and corruption (Estrin et al., 2012), government capability (De Clercq and Dakhli, 2009; Estrin, Korosteleva, & Mickiewicz, 2013) and property rights (Chowdhury, Desai, Audretsch, & Belitski, 2015).

While informal institutions refer to belief systems, social norms and culture, and cognitive aspects (skills, risk-taking, leadership, etc.) (North, 2005), these institutions tend to reduce the uncertainty in economic decisions, particularly those associated with entrepreneurial activity. With respect to belief systems, the most-used institution is role models, followed by welfare and society (Field, Jayachandran, & Pande, 2010). As for the social norms and culture, the most common variables are corruption control (Anokhin & Schulze, 2009) and community norms (Bruton et al., 2009). With regard to cognitive aspects, Levie and Autio (2008) and Estrin and Mickiewicz (2012) used variables such as confidence, motivation and opportunity perception.

Bruton, Ahlstrom, and Li (2010) explored institutions as antecedents of entrepreneurial activity; institutions may provide an appropriate environment or impose barriers. In this sense, Gnyawali and Fogel (1994) suggested four environmental dimensions that affect the stage of the entrepreneurial process: 1) government policies and procedures, 2) socio-economic conditions, 3) business skills and 4) financial and non-financial assistance. The first dimension includes the government policies that guarantee that the market mechanisms act efficiently to create an appropriate context for corporate activity. In this dimension, three types of institutions are considered: property rights, business freedom and labor freedom. The dimension of socio-economic conditions includes the attitude of the government in relation to business activities, containing factors such as fiscal freedom. The dimension of business skills includes technical and commercial education, business training programs and the availability of information, which are the aspects that comprise educational capital. Regarding financial and non-financial assistance, emphasis is placed on the access to credit in a country, which allows the creation of new companies or the growth of existing ones, considered within financial freedom (Fuentelsaz, González, Maicas, & Montero, 2015).

Trettin and Welter (2011) confirmed that the understanding of institutional factors contributes to the discussion about the influence of the context on entrepreneurial activity, supporting the proposed distinction in this article between rural and urban entrepreneurship. Accordingly, the impact of formal institutional factors is analyzed: objective insecurity, the procedures for starting a business and the informal institutional factors—subjective insecurity and social norms, making use of the information provided by the Global Entrepreneurship Monitor (GEM), the World Bank and the Colombian database of the CEDE (Center for Studies on Economic Development).

2.2. Rural and urban entrepreneurship in Colombia

In Colombia, the role of entrepreneurs and the conditions under which the development of their activities began are linked with the beginning of the industrialization process in the country (Safford, 1965). The first entrepreneurship initiatives arose in the mid-nineteenth century in a period in which the economic activity was concentrated in the efforts of landowners, who engaged in agriculture and gold mining. Entrepreneurship activities started in Antioquia and then spread to different regions of the country (Rodríguez, 2015). In the mid-twentieth century, Colombia, being mainly a rural country, concentrated its economic growth on primary products like coffee and suffered international instability due to World War II. This fact made the imports of the necessary goods for industrial development experience a major drop, which forced Colombia to follow an industrialization process based on import substitution (Rodríguez, 2015). In this period, there was rapid migration within the population from rural areas to urban centers, seeking better living conditions and escaping violence. Between the 1960s and the 1970s, economic development in Colombia was based on development-oriented theoretical models, such as the CEPAL's model, in which the entrepreneur was predicted and characterized as an industrialist located in urban centers; these models generated the undervaluation of other important activities for economic development, like agriculture and commercial trade (Rougier, 2013).

Hence, public policies towards entrepreneurship, which had previously focused more on small-scale agricultural producers in rural areas, began to address industrialist producers in urban areas instead. Due to this, the public politics supported large urban industry as the main source of the labor demand and promoted various private initiatives that sustained entrepreneurship programs in the main cities of Colombia (Misas, 1991). In the 1980s, the public politics encouraged microenterprises as a new way of promoting a different production system in large industry. However, the arrival of this new type of enterprise revealed some weaknesses in the reality of entrepreneurship activities, such as the lack of capital and the difficulties entailed in entering new markets (Rodríguez, 2015). Since the 1980s, different governments have upheld the trade liberalization process, leading to significant changes in the productive structure of the country. Public policies were directed to microenterprises and SMEs and aimed to help entrepreneurs to enter new markets through various mechanisms of financing, training and technological support to improve productivity and drive towards formalization, among others (Ramírez, 1998).

In the twenty-first century, the phenomenon of globalization led to big changes, which based the productive structure of countries mainly on the formalization of microenterprises, requiring a change in the approach of those who established public policies directed to this group of companies (Vesga, 2008). Based on this new horizon, the national government recognized the importance of articulating the public and private sectors to promote the creation of new enterprises. Consequently, the context in which the enterprise development is being carried out would permit more favorable conditions that guarantee their survival, executing training and advisory programs to help the improvement of productivity in different sectors of the regional economy, addressing both urban companies and rural companies (INNPULSA, 2017).

In Colombia, as in most of the Latin American countries, the development level is different for those living in rural and in urban areas. Given that 75% of the members of the population are located in cities, they have more access to better business opportunities, while the other 25%, who are located in rural areas, demand a system of participation that enables them to improve their conditions to match those of the people who live in urban areas (Bravo & Gámez, 2011). According to Murcia (2011), companies in the agricultural sector not only promote rural development in the country but also stimulate urban and industrial development, having significant economic and social impacts on the whole economy. Nevertheless, rural entrepreneurs in Colombia have their main field of action in the informal primary sector given that the formal sector is made up of large business groups. For this reason, some systems of support have been developed for rural entrepreneurs; this support focuses on education, aiming for the development of rural microenterprises. In recent years, Colombia has been characterized by several historical changes, among which are the attempts to complete the peace process, the increase in economic indicators, the signing of free trade agreements and the rest of the political reforms that support the skepticism in the development of corporate activity, in which rural entrepreneurship has been affected the most by the effects of the armed conflict (Zuluaga, 2010). To compensate for these problems, the state and private companies have tried to merge to develop initiatives that will strengthen the agricultural sector, driving the execution of productive projects in the above-mentioned sector (Taborda & Sosa, 2014). These initiatives are based on the potential of the rural sector in Colombia, where the future of the country could be leveraged by the use of land. Nevertheless, for this to happen, the differential gap between the investment in urban and rural entrepreneurs must be reduced through the support of institutions.

2.3. Proposed hypotheses

Rural areas tend to offer certain opportunities and incentives to undertake different types of production, principally agriculture, given the geographical conditions that allow the development of this activity in these areas (Korsgaard et al., 2015). However, the socio-economic and institutional conditions in which the entrepreneurial activity is carried out within these areas tend to differ from those in urban areas. In this way, Krugman and Venables (1995) highlighted the importance of governance to overcome the socio-spatial deficiencies inherent in rural entrepreneurship to the extent that authors such as Otsuka and Sonobe (2011) attributed the failure of corporate activity in rural areas to the traditional government policies implemented in many countries in the world.

The different institutional environments and public policies of countries determine the conditions of the market and the growth strategies of the companies. According to Child and Lu (1996), companies from emerging countries face great institutional limitations as the result of the regulating systems, the information provided by these systems and the access to credit of the public sector. Additionally, Hoskisson et al. (2000) highlighted the weak institutional frameworks as a characteristic of emerging countries that have negative effects on their business performance. In the case of Latin American countries, among them Colombia, Nicholls-Nixon,

Castilla, García, and Pesquera (2011) and Vassolo, De Castro, and Gomez-Mejia (2011) highlighted the importance of the institutional context for the development of corporate activity, in which the vulnerability and weakness of institutions make way for high levels of corruption and informal economic activity. In Colombia, the Government has been concerned with giving new companies access to public contracts, yet it has failed to create an appropriate environment in which they can develop their productive capacities and to offer information and assistance regarding business development, expansion and efficiency, considering that their policies do not manage to adjust the market failures (Cardoza, Fornes, Farber, Gonzalez, & Ruiz, 2016).

One of the key elements of corporate activity is the procedures for starting a business, which constitute an important formal institution. This formal institution is followed by the rules and procedural requirements that are established by the government, which can motivate—or not—the creation of companies, according to the level of regulations and the number of reports required for the different institutions (Gnyawali & Fogel, 1994).

In terms of the socio-economic conditions dimension, it is also recognized that citizens' insecurity can affect entrepreneurial activities in Latin America. Objective insecurity is the number of acts of violence that occur in a territory (FUNDAUNGO, 2012). In this region, the violent context generates high protection expenses that must be assumed by entrepreneurs (Pinazo-Dallenbach et al., 2016).

Following the informal institutions, entrepreneurs' perception can be affected by citizens' insecurity. Subjective insecurity is the perception of the degree of risk of the citizens (Pinazo-Dallenbach et al., 2016).

Finally, Busenitz, Gomez, and Spencer (2000) suggested that, among the normative dimensions, as an informal institution, are the social norms, values and beliefs that determine human behavior. Social norms determine the means by which certain goals can be pursued. These types of behavioral norms are rarely questioned and shared socially, to the extent of being transmitted among the same individuals, and their acceptance is based on its legitimacy (Stenholm, Acs, & Wuebker, 2013).

2.3.1. Objective insecurity, subjective insecurity and entrepreneurial activity

Entrepreneurs are directly influenced by the internal conflict in their country; conflict can deplete the capital stock of firms as well as the human capital (Brück, Naudé, & Verwimp, 2013). The insecurity caused by the conflict is measured by the institutions with information on the number of crimes or violent acts that occur in a determined period of time. This report generates considerable expenses for entrepreneurs, who invest in protecting themselves and their assets against insecurity and violence (Schwab-Stone et al., 1999). Thus, objective insecurity reduces the productivity of businesses, causing many entrepreneurs to diminish their investment in new businesses, given that these seem to be less attractive as a result of violent or corrupt acts in the territory (UNDP, 2013).

In addition to the number of violent acts reported by institutions, entrepreneurs also have to take into account the degree of risk that they have to face in general. Staub (2003) and Anckermann et al. (2005) determined that violence has psychological consequences that exert a major impact on individuals, especially with respect to their entrepreneurial behavior. Subjective insecurity differs for each individual; it is based on their personal perception, which is influenced by factors such as experience, the opinions of other and prejudices, among others.

Brück, Justino, Verwimp, Avdeenko, and Tedesco (2016) and Muhammad, Ullah, and Warren (2016) applied the institutional perspective to analyze the problems of regional entrepreneurship subject to conflict situations, arguing that entrepreneurs are affected negatively by these situations, since the conflict exhausts their capital stock, directly affecting the way in which individuals and regions perceive earning opportunities. For these authors, the main factor for business success is a favorable environment, as security problems have caused companies to close in various areas of conflict, as underlined by events in Pakistan and Afghanistan. In addition, the formal institutions in these countries tend to work more for the development of urban areas and leave aside the future of rural areas. In the Colombian case, the rural population has been the main scene of violence and social and political conflicts concerning disputes over land and territorial control (Ropero, 2015). In Colombia, the armed conflict has caused a superior impact on the rural population, producing an increase in displacement, migration and the weakness of property rights as a consequence of this massive expulsion of inhabitants from rural areas. Therefore, this has generated greater economic instability whereby rural economic activity is on the edge of being problematic (Gutiérrez, 2014). Consequently, the following hypotheses are proposed:

Hypothesis 1. The perception of subjective insecurity moderates the relation between objective insecurity and entrepreneurial activity, having a greater effect on rural than on urban entrepreneurship.

2.3.2. Procedures for starting a business, subjective insecurity and entrepreneurial activity

Companies face entrance regulations in many countries, having to support multiple and expensive administrative procedures for operating under legal standards (Prantl & Spitz-Oener, 2009), such as entry restrictions, commercial regulations and specific standards for individuals who want to start new firms. The procedures for starting a new firm include the length of time taken to start a business, the number and cost of any permits or licenses required and the minimum capital requirements for a new firm (van Stel, Storey, & Thurik, 2007). Gnyawali and Fogel (1994) found that these procedures and regulations are perceived negatively by entrepreneurs, because, when starting a business, they need to adhere to multiple regulations that take time and money. Aparicio et al. (2016) indicated that the *Doing Business* project of the World Bank promotes the reduction of regulations, suggesting the implementation of simple procedures to increase the development of new firms. Additionally, subjective insecurity affects the relation between procedures for starting a business and entrepreneurial activity negatively; not only the number and cost of procedures but the collateral cost of acts of violence in the country are involved. The perception of insecurity among citizens generates other expenses for entrepreneurs, who invest in pricy technological protection systems (Pinazo-Dallenbach et al., 2016). Many entrepreneurs prefer not to create a new business or even abandon their own firm, especially when they are pressured to make illegal

tax payments by criminals (UNDP, 2013).

However, this relationship may differ according to the economic performance; Álvarez and Urbano (2011) suggested that Latin American countries have high rates of informal entrepreneurship, therefore displaying that entrepreneurs avoid following the required legal procedures for starting a business. Brück et al. (2013), in their study on entrepreneurship and conflict in the rural and urban areas of Colombia, Sierra Leone and India, stated that the impact of violence on entrepreneurship differs according to country or region. The perception of insecurity in rural areas influences commercialization, directly affecting the business activity and leading production to focus only on self-consumption in homes as a measure of protection against the danger of displacement. In contrast, urban areas are often not directly affected by violence, but the perception of insecurity that arises from the common delinquency that is formed in cities can generate higher costs for businesses. Though, unlike rural entrepreneurs, who are often the most affected by insecurity, urban areas, as they are the destination of rural displaced persons, may experience more opportunities for profitable businesses and thus procedures to facilitate the formation of companies, which can be useful for allowing entrepreneurs to take advantage of these opportunities; then, new alternatives of occupation for displaced people can be offered. In the case of security, Colombia has long experienced the effects of violence. This is a country with at least a quarter of its population residing in rural areas, which have been the main stages for the internal armed conflict (Ropero, 2015). The rural population has remained at the center of the reality of the armed conflict, which has been a factor related to poverty, displacement, dispossession of assets, violence and other associated conflicts (Ropero, 2015). Therefore, the following hypothesis is proposed:

Hypothesis 2. The perception of subjective insecurity moderates negatively the relation between the procedures for starting a business and the entrepreneurial activity, having a greater effect on rural entrepreneurship than on urban entrepreneurship.

2.3.3. Objective insecurity, social norms and entrepreneurial activity

Violence has social connotations; conflict can result in the cessation of entrepreneurial activity (Muhammad et al., 2016). These conflictual environments must be countered by formal institutions through government policies and military forces as well as informal institutions, such as culture norms and values (Bratton, Callinan, Forshaw, & Sawchuk, 2007). Violence also tends to appear in countries where people are likely not to care about legal norms; any illegal behavior becomes normal as long as it is accepted and engaged in by many people (Axelrod, 1986). In this way, illegal behavior represented in acts of violence can be avoided or reduced for a social norm, and an individual can carry out business if there is a high business perception that other entrepreneurs will do so as well (Tonoyan, Strohmeyer, Habib, & Perlitz, 2010). Formal institutions tend to work well in urban areas but to a lesser extent in rural areas, which are often set in their own customs and values (Nouman, Siddiqi, Asim, & Hussain, 2013). As a result of the armed conflict in Colombia, many rural inhabitants ran away from their territories, which caused transference of property due to criminal organizations' use of force (Garay, 2011). Due to the difficulties for formal institutions to face these forces, social norms may have an effect on the relation between objective insecurity and entrepreneurial activity that could be greater in rural entrepreneurship than in urban areas; in rural areas, there is an accumulation over time of elements in the social, cultural and historical fields through the people who work there (Williams, Balaz, & Wallace, 2004). The study on the northeastern regions of Pakistan conducted by Muhammad et al. (2016) confirmed these assertions, finding that, when the security threat is very strong, the legitimacy of the region's traditional norms and values has a great value that contributes to the creation of alliances or to the search for negotiations that are intended to preserve business activity and thereby benefit the community in general. This type of perception that rural entrepreneurs create regarding the characteristics of the place in which they develop their activities creates the main cause of the rural space to obtain benefits. The place acquires a meaning, which generates feelings of commitment and responsibility towards the community, leading entrepreneurs to develop new businesses that allow local development to take place (Korsgaard et al., 2015). This leads us to propose the following hypothesis:

Hypothesis 3. The favorable perception of social norms moderates positively the relation between objective insecurity and entrepreneurial activity, having a greater effect on rural entrepreneurship than on urban entrepreneurship.

2.3.4. Procedures for starting a business, social norms and entrepreneurial activity

Social norms exert an influence on individuals' desire to create companies; therefore, if the social norms and beliefs of a group accept the entrepreneurial activity, this will affect the business intentions of individuals (Krueger, Reilly, & Carsrud, 2000). In this way, all the social norms that accept the business initiative will favor the implementation of cultural norms and legal procedures that encourage the entrepreneurial activity (Cuervo, 2005).

Stenholm et al. (2013) suggested an interplay between the legal framework, the culture and other institutions for shaping different types of entrepreneurial activity. The legal pressures to enforce the regulations and procedures for starting a business can be reduced for social norms; if entrepreneurial activity is perceived as desirable, entrepreneurial intentions are more likely to occur (Stenholm et al., 2013). These subjective perceptions are related to norms, values and cultural meanings that affect human behavior (North, 1990). As mentioned in the previous section, the inhabitants of the rural areas in a country have a social, cultural and historical root that stands out in all its activities, including business activities (Korsgaard et al., 2015). Several regional studies (Brandth & Haugen, 2011; McGuire, Morton, & Cast, 2013; Stenholm & Hytti, 2014) have found that, in the agricultural sectors of some European countries, the interaction between formal and informal institutions has improved the possibility to develop resources for business activity in these regions, given emphasis to government policies and other institutional forces, like expectations against social norms, and influenced the creation of businesses in rural areas. This is because the legitimacy of the social context is perceived and, with this, the legitimacy of formal rules for business activity is also recognized, being incorporated into the identity of rural

entrepreneurs and thus enabling an understanding of the importance of formal requirements to access various forms of business support. Consequently, the following hypothesis is presented:

Hypothesis 4. The favorable perception of social norms moderates positively the relation between the procedures for starting a business and the entrepreneurial activity, having a greater effect on rural entrepreneurship than on urban entrepreneurship.

3. Data and methodology

This article uses a hierarchical logit model. According to [Liu and Gupta \(2007\)](#), a hierarchical or multilevel approach is recommended when managing data adjustment in progressive steps; at the same time, a reduction in uncertainty is required. Within this hierarchical construct, different types of uncertainties are systematically addressed.

In this way, the hierarchical model's intention is to acquire a common distribution that tends to be difficult to compute; then, the factoring of data into a sequence of conditional probabilities is necessary to facilitate their characterization by employing the available knowledge and data ([Liu & Gupta, 2007](#)).

Some of the main characteristics of multilevel models are the generalizable relationship between the independent and the dependent variables in organizational entities and their frugal and powerful nature. A more evident theory and ideal data collection are obtained from the analysis of the assumptions of variability that is fundamental for each hypothesis; at the same time, different strategies are analyzed for those hypotheses ([Klein, Dansereau, & Hall, 1994](#)).

In this paper, we propose a model with three (3) levels:

Model 1: a model with control variables;

Model 2: a model with control and principal variables;

Model 3: a model with control, principal and moderation variables.

Thus, we use unbalanced panel data for the period 2000–2013, and our first dependent variable, *total entrepreneurial activity* (TEA), is the indicator of the Global Entrepreneurship Monitor (GEM). The TEA shows those entrepreneurs who are motivated to create business opportunities. This variable is calculated for both rural and urban environments in Colombia from the municipalities or territories surveyed by the GEM.

The data on independent variables, specifically those that are informal and formal institutions, are obtained from the GEM (procedures for starting a business and social norms) and the Center for Studies on Economic Development (CEDE; subjective insecurity and objective security). Additionally, data on the economic growth rates are obtained from the World Development Indicators (WDI) database. In terms of the measure of each variable, *overall entrepreneurial activity* (OEA) is the percentage of adults between the ages of 18 and 64 who are setting up a business or owning-managing a young firm (up to 3.5 years old), including self-employment. With respect to *objective insecurity* (OI), this variable captures the number of acts of violence that occur within a territory; *subjective insecurity* is a perception index that captures how insecurity is perceived in each city (rural and urban); *procedures for starting a business* measure the proxy agility and efficiency of procedures, whereby new entrepreneurs can complete all administrative and legal procedures in approximately one week; and *social norms* measure the percentage of the adult population who agree with the statement that, in their country, people ascribe high status to successful entrepreneurs. A logit is used to estimate the rural and urban models.

Given that different data sets are combined, we can obtain a sample of 30 cities in Colombia with a regular time series. Furthermore, regarding the importance of analyzing our issue regarding cities in Colombia (rural and urban), as 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 321 observations and 30 cities.

4. Results and discussion

[Table 2](#) reports the means, standard deviations and correlations of the variables used in this study for two groups: rural and urban. As [Table 2](#) shows, the TEA is correlated with all the formal and informal institutions of this study. Once the correlations are obtained, we test the multicollinearity for each group through the *variance inflation factor* (VIF). The VIF values are low (lower than 1.25 (rural control model), 1.35 (rural principal effect) and 1.5 (rural model with moderations) and 1.18 (urban control model), 1.32 (urban principal effect) and 1.52 (urban model with moderations)).

[Table 3](#) below shows the general results of the hierarchical models performed for rural and urban areas, respectively. The first model is performed with the control of the variables; later, the main effects are included and finally the effects of the moderation. [Table 3](#) shows that, for both groups, the complete model (model 3 for urban and rural) has better adjustment indicators related to the change in F that is significant ($p < 0.00$), allowing us to conclude that it is the best model for both groups.

[Table 4](#) shows the results of the logit model for rural and urban cities with robust estimators. In model 1, the TEA is considered as a function of control variables such as the *population age* (PA) and *economic growth rate* (EGR). On the other hand, model 2 estimates the TEA as a function of control variables and the main effects of formal and informal institutions such as *objective insecurity*, *social norms*, *subjective insecurity* and *procedures for starting a business*. Finally, in model 3, both previous blocks of variables are included, but the idea that informal institutions moderate formal ones is added. All the models are significant, and high explanatory power is obtained, explaining more than 65% of the TEA variance for both rural and urban areas.

The third model for rural and urban areas confirms that all the informal institutions have statistical significance and exert an

Table 1
Description of the variables.

Variable	Definition	Source
Dependent variable	Overall entrepreneurial activity (TEA)	Total early-stage entrepreneurial activity. 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.
Independent variables	Formal institutions	Objective insecurity (OI) Procedures for starting a business (PSB)
	Informal institutions	Subjective insecurity (SI) Social norms (SN)
Control variables	Population ages 15–64 (PA)	Proxy agility of procedures; new entrepreneurs can complete all administrative and legal procedures in approximately one week Perception of insecurity High status indicates the percentage of the adult population who agree with the statement that, in their country, people attach high status to successful entrepreneurs
	Economic growth rate (EGR)	Total population between the ages of 15 and 64 is the number of people who have the potential to be economically active. 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.

WDI: World Development Indicators by the World Bank. <http://databank.worldbank.org/data/home.aspx>. GEM: Global Entrepreneurship Monitor. <http://www.gemconsortium.org/>. CEDE: Center for Studies on Economic Development. <https://datoscede.uniandes.edu.co/microdatos-detalle.php?263/2/153/#tab1>.

Table 2

Descriptive statistics and correlation matrix.

Variables	Mean	S.D	Mean	S.D	1	2	3	4	5	6	7
TEA	3.25	4.1	2.412	0.345	1						
Objective insecurity (OI)	43.995	17.42	48.511	8.228	0.126	1					
Procedures for starting a business (PSB)	4.135	0.975	4.167	0.291	0.445	0.029	1				
Subjective insecurity (SI)	1.221	0.964	0.416	0.123	−0.387	−0.189	0.123	1			
Social norms (SN)	3.23	0.562	5.636	1.26	−0.49	0.125	0.145	0.014	1		
Population aged 15–64 (PA)	24534	1.964	5242	1.123	−0.131	0.008	0.232	−0.113	−0.108	1	
Economic growth rate (EGR)	3.23	0.562	5.636	1.26	−0.334	0.229	−0.493	−0.148	0.516	−0.648	1

Table 3

Adjustment statistics.

Models											
	Model	R	R squared	R squared adjusted	Standard error of estimation	Stats of change					
						Change in R squared			Change in F	Sig. Change in F	
URBAN	1	.589 ^a	0.346	0.342	0.969	0.346			77.125	0	
	2	.635 ^b	0.403	0.392	0.931	0.056			9.039	0	
	3	.657 ^c	0.432	0.416	0.913	0.03			4.938	0.002	
RURAL	1	.619 ^a	0.362	0.358	0.929	0.362			79.52	0	
	2	.682 ^b	0.433	0.430	0.942	0.070			10.055	0	
	3	.711 ^c	0.451	0.448	0.943	0.18			6.927	0.000	

d. Dependent variable: TEA.

^a Predictor: (Constant), PSB, PA.^b Predictor: (Constant), PSB, PA, SN, OI, SI, PSB.^c Predictor: (Constant), PSB, PA, SN, OI, SI, PSB, OI*SN, PSB*SN, OI*SI, PSB*SI.**Table 4**

Estimating the TEA with formal and informal institutions.

(Constant)	Control model		Principal effect model		Model with moderations	
	Rural	Urban	Rural	Urban	Rural	Urban
	coefficient	coefficient	coefficient	coefficient	coefficient	coefficient
Social norms (SN)			.1429 (4.834)	.1321 (3.941)	.048 (1.982)	.0035 (1.351)
Objective insecurity (OI)			−.0258 (−1.158)	−.0221 (−1.021)	−.0551** (2.030)	−.0482** (1.971)
Subjective insecurity (SI)			−.1656 (−2.037)	−.1541 (−1.967)	−.0181 (1.611)	−.0261 (1.731)
Procedures for starting a business (PSB)			.01539 (1.986)	.01345 (1.896)	.0243*** (2.761)	.0203*** (2.032)
OI*SI					−.01428*** (−4.745)	−.01314*** (−3.452)
PSB*SI					−.2520*** (−3.256)	−.2181*** (−2.947)
OI*SN					1.1836*** (8.5453)	1.1361*** (7.5453)
PSB*SN						
Population age (PA)	.12270 (2.81)	.1345 (2.93)	.0002 (1.18)	.0001 (1.10)	.0012 (0.125)	.0008 (0.093)
Economic growth rate (EGR)	−.16257 (12.377)	.234 (4.345)	−.0024 (−1.650)	−.0019 (−1.450)	−.0028 (1.590)	−.0023 (1.380)

impact on entrepreneurial activity ($p < 0.005$). This allows us to confirm the relevance of this type of institution in the Colombian context to the improvement of the entrepreneurial results. With respect to the rural model, the social norms have a positive and significant effect (rural: $b = 0.048$, $p < 0.05$ and urban: $b = 0.039$, $p < 0.10$) on the *total entrepreneurial activity* (TEA) in line with the previous literature reviewed (Stenholm & Hytti, 2014). On the other hand, objective security has a negative and significant effect (rural: $b = 0.0551$, $p < 0.01$ and urban: $b = 0.0482$, $p < 0.05$).

Informal institutions can also be meaningful. *Subjective insecurity* has a negative and significant effect (rural: $b = 0.0181$, $p < 0.10$ and urban: $b = 0.0261$, $p < 0.10$) as well as *procedures for starting a business* (rural: $b = 0.0243$, $p < 0.01$ and urban: $b = 0.0203$, $p < 0.01$).

Concerning the hypothesis testing, *Hypothesis 1* proposed that the perception of subjective insecurity moderates negatively the relation between objective insecurity and entrepreneurial activity. The coefficients for rural and urban are negative and significant (rural: $b = −0.01428$, $p < 0.01$ and urban: $b = −0.01314$, $p < 0.01$). For that reason, entrepreneurial activity is not only affected by terrorist acts, robberies and other criminal acts but also negatively influences the perception of insecurity. The results also show

that the coefficient for rural areas is higher than that for urban ones, supporting [Hypothesis 1](#), which affirms that the perception of subjective insecurity moderates the relationship between objective insecurity and entrepreneurial activity, having a greater effect on rural entrepreneurship than on urban entrepreneurship ($t = 2.45$, $p > 0.01$). This can be stated because the rural contexts are associated with higher levels of insecurity and rejection of the state to protect citizens. This hypothesis is supported by [Brück et al. \(2016\)](#) and [Muhammad et al. \(2016\)](#), who considered that conflict situations in a country and all the collateral problems that can emerge can affect entrepreneurs negatively, not only because they generate a deceleration in investment but also because employers perceive a greater risk (subjective insecurity) and many see uncertainty and insecurity as reasons to close their business. Additionally, the [UNDP \(2013\)](#) indicates that violent acts in a country or region produce a decrease in the performance of companies, limiting the entry of new entrepreneurs. In Colombia, the situation of insecurity tends to affect the rural population more, since historically the armed conflict has been carried out in these areas and has had a direct significant impact on this population, generating social and economic instability in these regions and a wider gap between the conditions of rural and urban areas. These results focus on the importance of the cognitive dimension within informal institutions ([Estrin & Mickiewicz, 2012](#); [Levie & Autio, 2008](#)), yet in this study the effect is the opposite, given that, with negative perceptions, uncertainty in economic decisions tends to increase.

[Hypothesis 2](#) suggested that the perception of subjective insecurity moderates negatively the relation between the procedures for starting a business and the entrepreneurial activity, having a larger effect on rural entrepreneurship than on urban entrepreneurship. This hypothesis is supported by the data presented in this paper; the presence of subjective insecurity in conjunction with a large number of procedures for starting a business has a negative impact on entrepreneurial activity (rural: $b = 0.02520$, $p < 0.01$ and urban: $b = -0.02181$, $p < 0.01$), and the results also show that the coefficient for rural areas is higher than that for urban ones ($t = 1.96$, $p > 0.05$). This is in accordance with the literature by [Rospero \(2015\)](#) and [Pinazo-Dallenbach et al. \(2016\)](#), who mentioned that the costs associated with the creation and development of new companies, added to the costs of protecting themselves and their business against violence and insecurity, can cause entrepreneurs to reverse their decision to create a business. Corresponding to [Hypothesis 2](#), these results demonstrate the influence of entrepreneurs' cognitive aspects related to their perceptions of opportunities according to the environment ([Estrin & Mickiewicz, 2012](#); [Levie & Autio, 2008](#)). In the rural population of Colombia, this relationship is much more remarkable, given that rural entrepreneurs had to pay the same armed actors to guarantee their protection and their companies, thus feeding the existence of these violent illegal groups.

On the other hand, [Hypothesis 3](#) suggested that the favorable perception of social norms positively moderates the relation between objective insecurity and entrepreneurial activity, having a stronger effect on rural entrepreneurship than on urban entrepreneurship. This hypothesis is also confirmed (rural: $b = 0.1832$, $p < 0.01$ and urban: $b = 0.1361$, $p < 0.01$) ($t = 3.12$, $p > 0.01$). The existence of social norms helps to control the negative effects of objective insecurity on entrepreneurial activity; that is to say, it acts as a highly effective control mechanism and is accepted by entrepreneurs ([Muhammad et al., 2016](#); [Williams et al., 2004](#)). Additionally, in rural contexts social norms are easier to consolidate and legitimize among all the citizens, whereas in urban areas the situation is complex due to the lack of unions and the larger population sizes.

[Hypothesis 4](#) suggested that the favorable perception of social norms positively moderates the relationship between the procedures for starting a business and the entrepreneurial activity, having a larger effect on rural entrepreneurship than on urban entrepreneurship. This hypothesis is confirmed for the rural and urban Colombian contexts (rural: $b = 0.1642$, $p < 0.01$ and urban: $b = 0.1212$, $p < 0.01$) ($t = 3.89$, $p > 0.01$). As in the previous hypothesis, the relevant role of social norms is confirmed as a social construction to improve formal mechanisms, such as the existence of procedures for starting businesses established by the previous literature ([Korsgaard et al., 2015](#)). In line with [Bruton et al. \(2009\)](#), the community norms reduce uncertainty in the decision-making process associated with entrepreneurial activity in general. At the rural level, social and cultural norms tend to have greater significance than government policies or norms ([Brandth & Haugen, 2011](#); [Korsgaard et al., 2015](#); [McGuire et al., 2013](#); [Stenholm & Hytti, 2014](#)). In Colombia, the rural population is usually represented by diverse indigenous groups that still have their own culture and set of norms in such a way that social norms can strengthen the compliance with the legal procedures that lead to the creation of new companies.

[Figs. 1 and 2](#) show the moderating effect of informal institutions (subjective insecurity and social norms) on formal institutions (procedures for starting a business and objective insecurity) for both rural and urban populations in Colombia. The Y axis of each graph represents the values obtained for the TEA for different values of each of the informal institutions in rural areas ([Fig. 1](#)) and in urban areas ([Fig. 2](#)), allowing the introduction of the regression function. On the X axis, the different values of each formal institution are presented.

In [Fig. 1](#), the relationships formulated in our hypotheses are contrasted and the significance of the moderating effect of SI or SN on each one of the formal institutions PSB or OI is evidenced. This verification is shown because in all cases the change of effect between **low** and **high** levels is significant ($OI^*SI: \beta_{high} - \beta_{low} = 5.22$; $t = 4.86$; $p < 0.01$; $PSB^*SI: \beta_{high} - \beta_{low} = 4.562$; $t = 4.62$; $p < 0.01$; $OI^*SN: \beta_{high} - \beta_{low} = 2.002$; $t = 1.92$; $p < 0.01$; $PSB^*SI \beta_{high} - \beta_{low} = 1.802$; $t = 1.99$; $p < 0.05$).

In the case of [Fig. 2](#), it can be seen that the significance of the four hypotheses is also fulfilled ($OI^*SI: \beta_{high} - \beta_{low} = 5.22$; $t = 4.86$; $p < 0.01$; $PSB^*SI: \beta_{high} - \beta_{low} = 4.562$; $t = 4.62$; $p < 0.01$; $OI^*SN: \beta_{high} - \beta_{low} = 2.002$; $t = 1.92$; $p < 0.01$; $PSB^*SI \beta_{high} - \beta_{low} = 1.802$; $t = 1.99$; $p < 0.05$).

Additionally, this study allows us to verify that informal institutions encourage the relationship between formal institutions and TEA, which is to say that social norms are a highly effective institution to counteract the negative effects of *objective security* and *procedures for starting a business*. These positive effects are verified to a greater extent in the dimensions of rural areas than in urban ones, where social conditions make people look for mechanisms of control and regulation outside of formal institutions as an alternative to improve the results in the TEA.

These results suggest the possibility of improving the rate of entrepreneurial activity based on the creation of strong social norms and trying to reduce the perception of insecurity (subjective security) within the population.

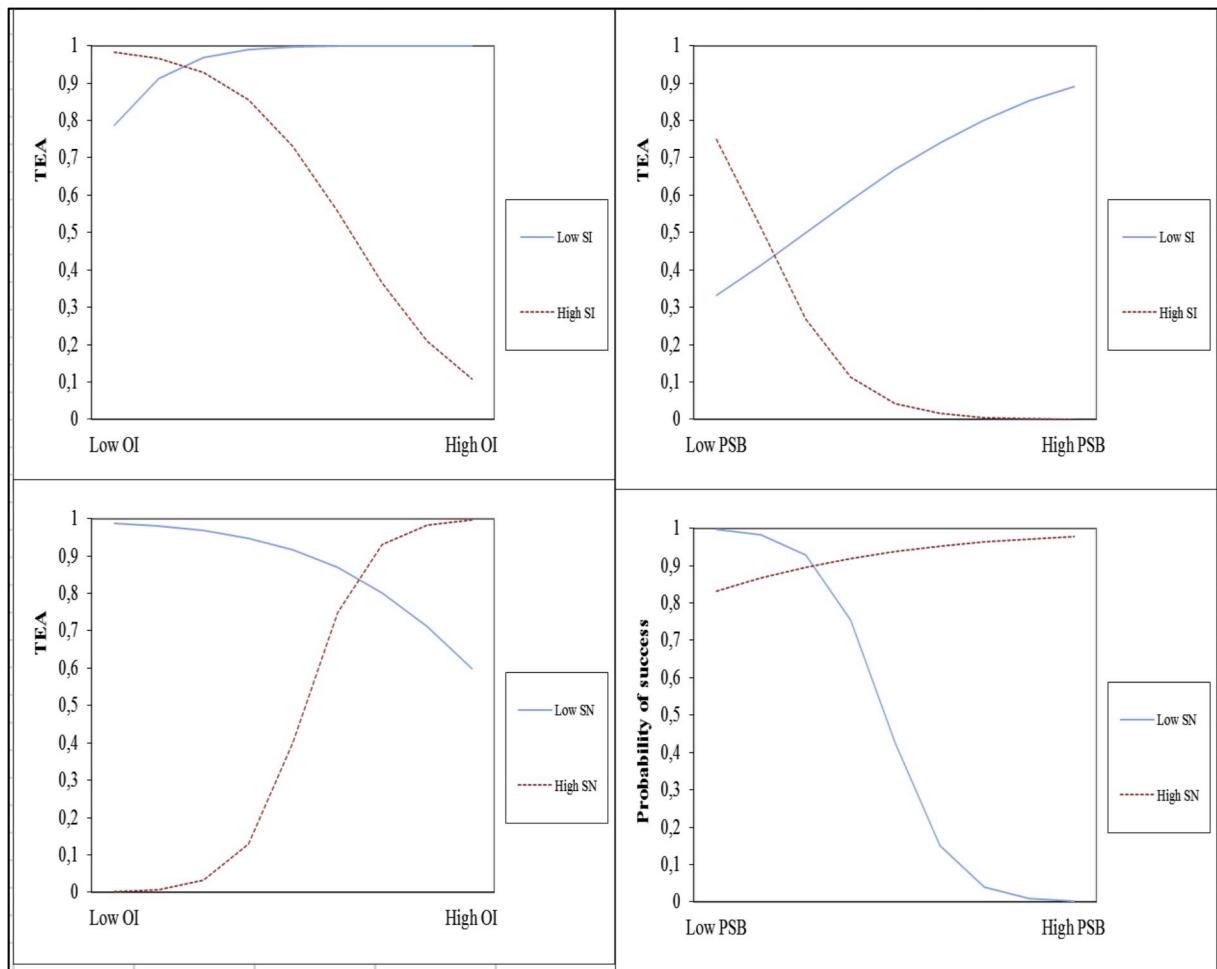


Fig. 1. The moderating effect: Rural areas.

6. Conclusions

During this research, a hierarchical logit model with panel data (2000–2014) was used to examine empirically the effect of institutional factors on entrepreneurship activity in rural and urban areas of Colombia. Based on institutional theory, we analyzed the informal institutions (social norms and subjective insecurity) and formal institutions (objective insecurity and procedures for starting a business) and their impacts on entrepreneurial activity. We also considered this model in rural and urban regions of Colombia. The results obtained confirmed that the impact of formal and informal institutions on entrepreneurial activity is conditioned by the political and social contexts that mark a country or region and that this aspect may affect rural and urban areas in different ways in the same country. To sum up, it can be concluded that, in a country like Colombia, which for years has faced an armed conflict, a perception of constant insecurity for businesses and entrepreneurs has developed that has slowed the creation of new companies. Additionally, this perception is greater among the population of rural areas, where the conflict has had its greatest consequences.

This research yields three key results. First, there is evidence that informal factors serve as moderators in the relationship between formal factors and entrepreneurial activity, consistent with the proposals in foregoing studies. Furthermore, our results support the idea that informal factors are drivers of formal institutions and have a greater impact on entrepreneurial activity than formal institutions (Thornton et al., 2011; Aparicio et al., 2016). Second, social norms constitute an informal institution of vast relevance in entrepreneurial activity, in addition to improving the results of the formal institutions in entrepreneurial activity. The third aspect relies on the fact that rural entrepreneurship constitutes a field of study in the economic development of a country and is of great relevance to explaining the entrepreneurial activity in developing countries such as Colombia. The evidence found confirms that informal institutions achieve greater influence in rural than in urban contexts. Rural enterprises are favored to a greater extent by social norms, because they obtain greater diffusion and acceptance as they are smaller territories with major bonding between citizens. On the contrary, the existence of an informal institution, such as subjective insecurity coupled with objective insecurity, affects rural entrepreneurial activity to a greater extent than urban entrepreneurial activity, given that the perception of insecurity generates a snowball effect that limits the intentions to create new ventures.

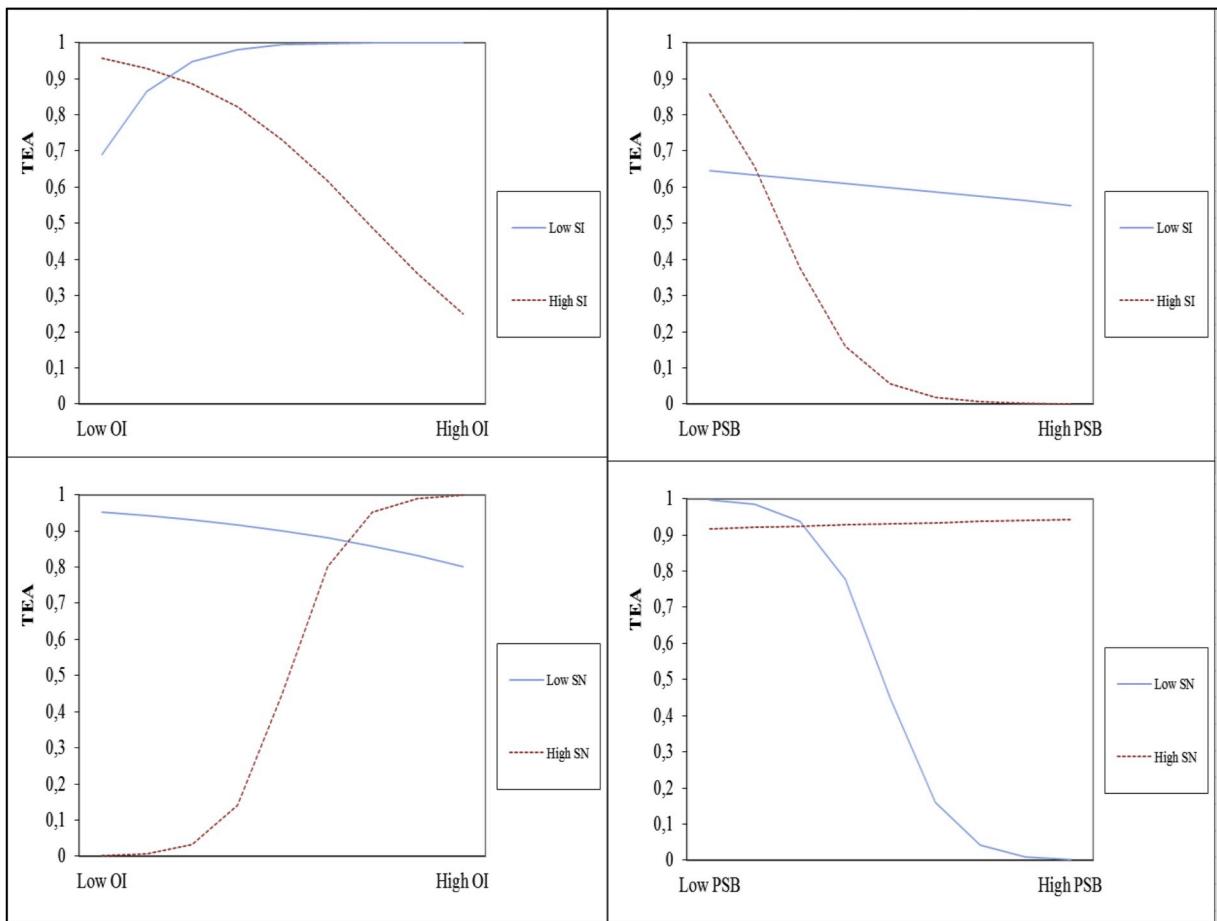


Fig. 2. The moderating effect: Urban areas.

This research contributes to the existing literature in the following ways. For instance, the study provides new empirical insights into the impact of institutions on entrepreneurial activity, especially because entrepreneurship is not analyzed in general but with the aim of explaining the impact of institutions in the rural areas compared with the urban areas of a country, using a sample from 30 different cities in Colombia (GEM, CEDE and WDI data for 2000–2013). Then, this paper helps to advance the study of institutional economics (North, 2005) for the analysis of regional entrepreneurship. Lastly, the work could be useful for the design of policies to foster entrepreneurship in rural and urban environments in Colombia or developing countries with similar conditions, considering the two institutional types analyzed, especially the relevance of social norms to the creation of new firms in rural and urban areas. Moreover, more flexible policies can be encouraged so that the rural population has more opportunities for and access to the creation of new businesses, taking into account the fact that their conditions differ from those of the urban population. In addition, rural entrepreneurial activity must have special support from the government in terms of training and analysis for members of the rural population as entrepreneurs.

It is necessary to consider some boundaries within this research. First of all, this study considers the analysis of rural entrepreneurship in Colombia, which has faced an armed conflict for many years; for that reason, these results cannot be generalized to all rural entrepreneurs in other countries. Consequently, this study could be extended to the analysis of countries with a different social and institutional environment to check whether the established relationships are maintained. Furthermore, it is proposed to carry out comparative studies of rural entrepreneurship among countries with different social and institutional contexts that could enrich the results. For these, the sample size and statistical method have been set up. The lack of highly detailed databases at the level of all rural and urban municipalities makes it difficult to obtain more variables to analyze entrepreneurial activity and obtain estimates with a higher confidence level. However, it is possible to combine reliable and highly relevant databases to contribute to the literature on rural entrepreneurship in developing countries. In contrast, this study uses the TEA, which is based on the percentage of entrepreneurs according to an age range, as a measure of entrepreneurial activity. The use of this measure does not fully reflect entrepreneurial activity, suggesting for future studies the use of constructs for which other aspects, such as the stages of entrepreneurship, are analyzed.

Future research may improve the proxies for variables, especially for independent variables like objective and subjective insecurity. Even though the use of a logit-type panel model allows a robust analysis for all the study units, it is not possible to detect

subgroups, especially in rural contexts. Rural cities have great dispersion among them in terms of resource availability, and, although they are controlled with some variables in this study, it is possible that other limitations can exist. Accordingly, it is suggested that future research should look for cross-sectional data that allow the use of a multilevel model.

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