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Twenty-five years of research on institutions, entrepreneurship, and economic growth: what has been learned?

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Abstract This paper analyzes an emergent stream of research shedding light on the institutional factors shaping entrepreneurial activity and its effect on economic growth. This integrative analysis spanning a broad spectrum of diverse literature enables a distinction between two different research lines in the field of entrepreneurship. The findings of this study, based on articles from the journals included in the Web of Science database, facilitate a broader comprehension of two separate lines of research, which allows an analysis of the interaction among institutions, entrepreneurship, and economic growth. The systematic literature analysis over the last 25 years (1992–2016) of research reveals that institutions could be related to economic growth through entrepreneurship, which would open new research questions about what institutional factors are conducive to entrepreneurship, which in turn spurs economic growth. Thus, not only is understanding both complex relationships and their possible sequence useful for planning strategies and public policies, but it is also helpful for advancing and providing new insights in these research fields, which could be complementary and interdisciplinary.

Keywords Institutional approach · Entrepreneurship · Economic growth · Economic development · Formal and informal institutions · Systematic literature analysis

JEL Classification B52 · L26 · M13 · O17 · O40

1 Introduction

Entrepreneurship research has attracted the attention of many scholars from different social sciences[1] in terms of cross-national variation in entrepreneurial activity, the reasons behind this phenomenon, and its possible consequences on the economy (Baumol and Strom 2007; Carlsson et al. 2009). On the one hand, some authors suggest that part of the reasons lies in the country-specific institutional contexts in which the entrepreneurs operate[2]. On the other hand, regarding the consequences, scholars such as Wennekers and Thurik (1999) and van Praag and

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[1] See the discussion offered by Blackburn and Kovalainen (2009), Fried (2003), Landström et al. (2012), and Teixeira (2011).
[2] See for instance Aidis et al. (2008), Alvarez et al. (2011), Busenitz et al. (2000), Dana (1987), Mueller and Thomas (2001), Reynolds et al. (1999, 2000, 2001), and Urbano and Alvarez (2014), among others.

Versloot (2007) have summarized those studies that empirically assess the effect of entrepreneurship on economic growth.

Although previous studies focused separately on the institutional factors behind entrepreneurship, and on its possible effects on the economy, there is limited understanding of the role that the institutional context plays in economic growth through the influence of entrepreneurial activity. For instance, one important conclusion derived from the studies by Bjørnskov and Foss (2016), Wennekers and Thurik (1999), and van Praag and Versloot (2007) is that the institutional environment needs to be explicit in order to understand why the effect of entrepreneurship on growth differs across regions and countries. In other words, the question is: how does the institutional environment affect entrepreneurship, which is one of the key factors that enhances economic growth? According to Bradley and Klein (2016), Bruton et al. (2010), and Thornton et al. (2011), among others, institutions have proven to be especially helpful in understanding how entrepreneurial activity is shaped and how entrepreneurs make decisions in order to improve the economy. However, Naudé (2011) claims that the understanding of the complete chain from institutions to economic growth remains unexplored. Audretsch et al. (2008) also highlight this idea, stressing the need to include the entrepreneurship factor into the neoclassical production function to assess its effect on economic growth. Although Audretsch et al. (2008) find that entrepreneurship has a positive impact on growth, they suggest not only new research in this line but also improving the measurement of the entrepreneurship variable. In fact, these authors are explicit in stating that institutions are required to explain the endowment of entrepreneurship in each region and country, which could be useful to understanding not only the difference in growth across countries but also why entrepreneurship has different effects on some countries compared with others (Acs et al. 2008a). Additionally, Audretsch (2012) concludes that to perceive the phenomenon of entrepreneurship and economic growth together could better encourage discerning the dynamic in both the entrepreneurship and economic fields (at the micro and macro levels). Thus, not only is understanding both complex relationships and their possible sequence useful for planning strategies and public policies, but it is also useful for advancing and providing new insights in these research fields, which could be complementary and interdisciplinary.

Therefore, the objective of this paper is to identify an emergent stream of research shedding light on the institutional context shaping entrepreneurial activity and its effect on economic growth. In particular, the paper focuses on the analysis of the literature about (a) the institutional factors affecting entrepreneurship; (b) the entrepreneurship impact on economic growth; and (c) the overall sequence from institutions to the relationship between entrepreneurship and economic growth.

Concerning the methodology, we selected articles from the journals included in the Web of Science (WoS) database. This systematic literature analysis covered articles from 1992 to 2016. In order to identify high-quality journals, we considered only journals with a 5-year impact factor higher than 0.1 according to Journal Citation Reports (JCR) for 2015. According to Buela-Casal and Zych (2012), Leydesdorff (2012), and Merigó and Yang (2017), by considering only the impact factor index as selection criterion might be problematic, since some manipulations such as self-citations can be performed in order to increase the index. Thus, WoS introduced 5-year impact factor to reduce such issues. Basically, the threshold we selected in this research is merely informative since practically all journals with a 5-year impact factor in economics, business, management, and related areas have an index higher than 0.1.

We conducted three types of searches, with the aim of exploring the two relationships and the overall sequence. We started with keywords that relate institutions with entrepreneurship and then entrepreneurship with economic growth. Finally, for the overall sequence, we combined all keywords from institutions to economic growth. In this last search, we found 451 articles that most commonly represent the second relationship. To conduct the search of the first relationship, we used the following keywords found in the title, abstract, and text of the articles: "institutions," "institutional theory," "institutional economics," "institutional approach," "institutional dimensions," "institutional perspective," "institutional pillars," "institutional drivers," and "institutional economic theory" which were combined with "entrepreneurship capital," "entrepreneurial activity," "ownership firms," "self-employment," "business ownership," "entrepreneurship," "new firm creation," "new firm formation," "new business creation," and "new venture creation." We obtained 5459 articles, which were filtered through different selection criteria. By following Merigó et al. (2016), we

applied restrictions on the database (Web of Science Core Collection only), business economics and related research areas, document type (articles and reviews only), and language (English only), resulting in 4071 records to be used for this literature analysis. Then, unavailable articles electronically were excluded (Aliaga-Isla and Rialp 2013; Jones et al. 2011).

Since we are interested in the causality from institutions to entrepreneurship at a macro level, we have rescrutinized each of these articles, by reading carefully the abstract and the introduction (and in some cases other sections of the paper) to assure those best fitting the objective of the study. With the same criterion in mind, we have not included in the literature analysis those papers that have studied institutions from the organizational level (cf. DiMaggio and Powell 1991). Thus, the final sample consisted of 104 articles. By using the same criteria and process, we explored the second relationship with the following keywords: "entrepreneurship capital," "entrepreneurial activity," "ownership firms," "self-employment," "business ownership," "entrepreneurship," "new firm creation," "new firm formation," "new business creation," and "new venture creation," which were combined with "economic growth," "economic development," "economic performance," "economic outcome," "regional growth," and "regional development." We initially obtained 4457 papers. After applying the same restrictions as in the first relationship, 2684 articles were identified. Finally, we considered 81 articles, which are focused only upon the impact of entrepreneurship on economic growth[3].

After this brief introduction, the article is structured as follows. In Section 2, we walk through the theoretical framework, which is useful for understanding what institutional factors affect entrepreneurial activity by enhancing economic growth. In Section 3, we present the results in terms of both relationships (institutions-entrepreneurship and entrepreneurship-economic growth), also discussing the structural view that concerns the overall sequence. In this section, we analyze papers per author and journal, theoretical frameworks, and techniques used. Finally, Section 4 concludes and highlights future research lines.

[3] It is important to highlight that we only focus on articles dealing with a country's or region's gross domestic product (GDP-total or per capita) or GDP growth, as well as labor productivity or total factor productivity (TFP) (van Praag and Versloot 2007).

2 Theoretical framework: institutional factors of entrepreneurship and its effects on economic growth

The debate about the determinants of economic growth still remains (Easterly and Easterly 2001; Helpman 2004). Since the work of Solow (1956) and Swan (1956), there has been a need for understanding the complexity of growth phenomena, whose initial factors such as physical capital, labor, and human capital, among others allow the possibility to study economic growth and the differences across countries. Apart from classical factors, since the late 1980s, this debate has turned to other types of determinants that consider new elements in classical production function (Aghion and Howitt 1992; Lucas 1988; Romer 1986). For instance, Weitzman (1996) highlights the role of technology and institutions in the economic growth process. Similarly, North (1990, 2005) provides a theoretical advance, suggesting the importance of institutions in the analysis of growth. According to North, institutions shape the progress intentionality of individuals in each society. From this idea, a new discussion arises to understand the role of institutions in the economic growth process (Rodrik 2003). In this case, Rodrik (2003) suggests that institutions are not linked directly with the aggregated output, but they are behind the endogenous factors of economic growth. Key questions arise from the finding that the institutional context, apart from influencing the traditional inputs such as labor, human capital, physical capital, and knowledge, also conditions the individual choices that generate economic dynamics. Rodrik (2003) and Hausmann and Rodrik (2003) suggest that the links between entrepreneurship and industrial development imply that productive factors are highly influenced by the institutional environment.

Accordingly, North (1990, 2005) posits that both formal and informal institutions contribute to the crucial conditions conducive to economic growth. Following this idea, Acemoglu et al. (2014), Baumol (1990), and Rodrik (2003) suggest that institutions could affect economic growth in an indirect way rather than through a direct effect. Leibenstein (1968), based on Schumpeter's (1911) ideas, has suggested that entrepreneurship exerts an important influence on the business cycle and economic development. In this regard, several works have taken place to highlight the relevance of entrepreneurial activity in the short-, mid-, and long-term growth. For example, Baumol (1990, 1993) and Baumol and Strom

(2007) have discussed how entrepreneurship is needed to achieve better economic performance. At the same time, these authors have suggested that the better institutions the higher the level and quality of entrepreneurship, which ultimately allows for a higher development.

Plenty of literature has emerged to analyze empirically and theoretically the link between entrepreneurship and economic growth[4]. However, as recommended by Audretsch et al. (2008), future research should incorporate new measures of entrepreneurship as well as the understanding of how different institutions help to draw entrepreneurship that affects economic growth positively. Hence, the institutional approach[5] provides a broad insight into understanding how institutions are related to entrepreneurial activity as well as which institutions are most important for explaining entrepreneurship rates that enhance economic growth (Veciana and Urbano 2008). From a general perspective, the institutional approach argues that both the legal and socio-cultural environment determine the individual's decision to start a business[6].

Therefore, this article focuses on institutional economics (North 1990, 2005), which allows us to understand the institutional environmental factors that affect new business creation (Bruton et al. 2010; Thornton et al. 2011). Under this umbrella, institutional factors are the driving conditions for entrepreneurship, distinguishing between formal factors (e.g., procedures and costs to create a business, support mechanisms for new firm creation, etc.) and informal factors (e.g., entrepreneurial culture, attitudes towards entrepreneurship, etc.). On the one hand, according to North (1990), formal institutions (property rights, contracts, procedures, political structure, etc.) tend to reduce the transaction costs in order to enhance market performance related to prices and distribution. Therefore, these formal institutions can help the market work more efficiently by removing market imperfections and rigid administrative regulations (Djankov et al. 2002). One important characteristic of formal institutions is their nature to change in the short term, which facilitates (or hinders) individuals making productive decisions, among other things. On the other hand, informal institutions can be defined as belief systems (role models, independence, and trust, among others), social norms/culture (community-wide normative, embeddedness, a socially supportive culture, among others), and cognitive aspects (skills, risk-taking, and leadership, among others) (North 2005). These informal institutions that tend to endure a long time reduce the uncertainty caused by individual and group decisions. In this sense, some economic decisions could be associated, among others, with entrepreneurial activity.

Drawing on institutional theory, scholars have explored institutions as antecedents of entrepreneurial activity (Bruton et al. 2010). In this sense, institutions may encourage or hinder entrepreneurship by providing an appropriate environment or by imposing barriers. In this regard, Gnyawali and Fogel (1994) suggest that entrepreneurship development requires a suitable environment. Accordingly, government policies and procedures, entrepreneurial and business skills, socio-economic factors, and financial and non-financial assistance affect each stage of the entrepreneurial process from the opportunity recognition to the new venture creation. Scott (2008), in turn, has suggested that organizations at all stages are affected by different institutional pillars (regulative, normative, and cultural-cognitive). Based on North (1990, 2005) and Williamson (1985, 2000), other works have explored the same relationship, though extending the analysis to economic growth. In this regard, Bjørnskov and Foss (2016) have provided a review of the extant literature that addresses the complexity involved in the development process, leveraged by entrepreneurship and institutions. Through this insight, we understand institutions as precedents of entrepreneurship, which is related to the proportion of small businesses in a country and their dynamism, economic performance, and economic activity (Aparicio et al. 2016a; Audretsch et al. 2008; Sobel 2008).

If entrepreneurship connects institutions and economic performance, may the level of entrepreneurial activity be increased enough through policies and regulations such that a higher aggregated output is accomplished? Shane (2009) claims that policies unable of distinguishing between survival and high added-value entrepreneurs may generate harmful long-term outcomes. Blackburn and Ram (2006) argue that badly addressed strategies encouraging entrepreneurship create a social exclusion rather than an inclusive process, since new firms do not reach expected goals due, among other things, to the lack of markets and a supportive structure for social diversity.

[4] See for instance Acs et al. (2012), Audretsch and Keilbach (2004a), Audretsch and Keilbach (2008), and Wennekers and Thurik (1999), among others.

[5] In this article, we use indistinctively institutional approach, institutional perspective, institutional theory, institutional economics, and institutional economic theory.

[6] See for instance Aldrich and Zimmer (1986), Berger (1991), Busenitz et al. (2000), Manolova et al. (2008), Shapero and Sokol (1982), Steyaert and Katz (2004), Stephen et al. (2009), and van Stel et al. (2007), among others.

Thus, the debate on what types of entrepreneurial activities exist and create growth is still alive (Welter et al. 2017). Shane (2012) addresses the debate on what entrepreneurship is, distinguishing entrepreneurial activity as either an event or a process. Accordingly, entrepreneurship can be seen as an individual characteristic/decision, a firm/organization, or as a social phenomenon (Audretsch et al. 2015b). Hence, entrepreneurship, as a conduit between institutions and economic performance (GDP, national income, total factor productivity, labor productivity, regional economic growth, etc.), could be understood in many ways, such as nascent entrepreneurial activity—or TEA at individual level, start-up rates, or density (e.g., entrepreneurship capital at regional or country level), productive or unproductive entrepreneurship, innovative entrepreneurial activity, entrepreneurship engagement, self-employment, and opportunity-necessity entrepreneurial activity (i.e., motivation) (see Fig. 1).

The next section provides the results according to the content of each article, which are analyzed under the institutional lenses. The details of our final sample are contained in Appendix 1 and Appendix 2 in the electronic supplementary material.

3 Results of the literature review

3.1 Entrepreneurship and its institutional determinants

After applying the filters described in the introduction, 104 articles from the empirical (90), theoretical (10), and introduction special issues (4) literature were identified and selected to explain the relationship between institutions and entrepreneurship (see the details in Appendix 1 in the electronic supplementary material). All these articles propose (explicitly or implicitly) hypotheses with the sense that institutions affect entrepreneurship and overwhelmingly find compelling empirical evidence supporting those hypotheses. Thus, in our analysis, we focus only on those results that identify journals, years, authors, theoretical frameworks, and methods used to relate institutions with entrepreneurship. Also, according to the theoretical framework mentioned in the previous section, we identify those articles that use formal, informal, or both types of institutional factors.

Regarding the authors who have published the most articles focusing on this relationship, we found that Urbano has 16 articles, followed by Estrin (seven), Mickiewicz (six), Guerrero (five), Stephan (five), Audretsch (four), Desai (four), Pathak (four), Stephan (four), Aidis (three), Alvarez (three), Aparicio (three), Chowdhury (three), De Clercq (three), Sobel (three), Toledano (three), and Uhlaner (three). In total, we found 172 authors. Apart from those already mentioned, the rest have published one or two articles in this field.

With respect to those journals that publish articles with this relationship, we found that *Small Business Economics* has published the largest number (18.3%), followed by the *Journal of Business Venturing* (13.5%), *Entrepreneurship Theory and*

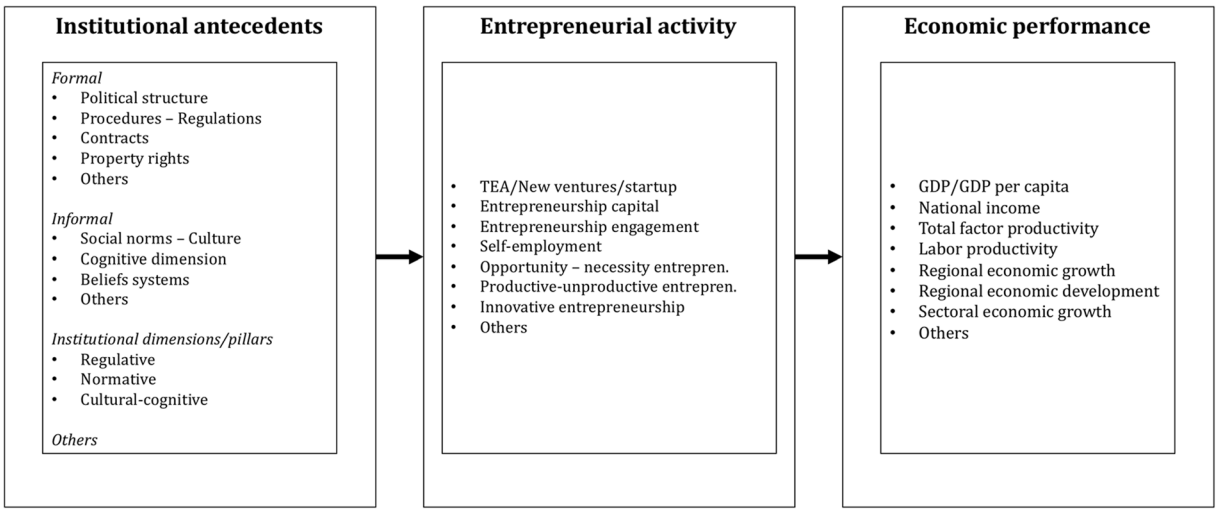

Fig. 1 Linking institutions, entrepreneurship, and economic growth

Practice (8.7%), *International Entrepreneurship and Management Journal* (6.7%), and *International Small Business Journal and* the *Journal of Business Research* (3.9% each). In addition, the *European Journal of Law and Economics*, the *Journal of Evolutionary Economics*, the *Journal of International Business Studies,* and the *Journal of Small Business Management* have 2.9% for each journal. The rest of the journals have published one or two articles, representing 1% (21 journals) or 1.9% (seven journals) of the total works analyzed. It is interesting to note that most articles hypothesizing that institutions have effects on entrepreneurship were published in the period between 2012 and 2016 (see Table 1). Also, note that in the period 2007–2011, the number of articles published reaches 33, followed by 54 in 2012–2016, indicating that this relationship is a vibrant and current research field of study by an increasing number of scholars. Here it is important to highlight that the *International Entrepreneurship and Management Journal* published an introduction special issue in December 2008 about the institutional approach to entrepreneurship. Similarly, *Entrepreneurship Theory and Practice* published in May 2010 a special issue about institutional theory and entrepreneurship; while in April 2011, the *International Small Business Journal* published a special issue on socio-cultural factors and entrepreneurial activity; the *Journal of Business Venturing* dedicated a number to institutions, entrepreneurs, and community in January 2013; and *Small Business Economics* published a special issue about institutions and entrepreneurship in March 2014 and other articles regarding this relationship in April 2014. The *European Journal of Law and Economics* was focused on regulation, firm dynamics, and entrepreneurship in August 2015, and the *Academy of Management Perspectives* dedicated a symposium in August 2016 of institutions, economic freedom, and entrepreneurship.

With respect to the theoretical framework, we found different approaches (see Table 2). Given our focus of analysis, the main framework found in our literature review is the institutional approach (70.2%). This approach uses North's (1990, 2005) ideas in terms of formal and informal institutions and their effects on entrepreneurship. Nonetheless, we also found that several papers using the institutional approach refer to this framework through different labels. The difference could be related to the decision on how to operationalize each type of institution (see Table 3). For example, formal institutions could be measured as policies, regulations, and governmental variables, among others[7], and informal institutions could be measured as attitudes, values, social norms, and religion, among others[8]. Similar to formal institutional factors (see Table 2), contract theory (6.1%) offers a framework to understand how the norm is created and what the possible effects are on entrepreneurial activity. Authors such as Anokhin and Schulze (2009), Bruno et al. (2013), Calcagno and Sobel (2014), Klapper et al. (2006), Román et al. (2011), Stephen et al. (2009), Van de Ven (1993) and van Stel et al. (2007) have used this theory to understand how entrepreneurship can be configured ex-ante and ex-post; in other words, what affects the creation of a new business and its subsequent development. Regarding those determinants more related with individual characteristics, occupational choice (5.3%) explains from a microeconomic point of view the decision to become an entrepreneur (cf. Gohmann 2012; Malchow-Møller et al. 2010). Finally, additional theories and perspectives that were found include social capital theory (Estrin et al. 2013b; De Clercq et al. 2010), resource-based view (Guerrero and Urbano 2012; Guerrero et al. 2014), geographical economics (Freire-Gibb and Nielsen 2014), a dissatisfaction perspective (Uhlaner and Thurik 2007), and Baumol's theory of productive and unproductive entrepreneurship (Sobel 2008), among others. All of these together, which we classified as "others," represent 18.4% of the total articles in Table 2.

These theories are helpful in explaining why it is important to use a set of variables from institutions (or institutional environment) that affect entrepreneurial engagement. Since North (1990, 2005) suggested a framework to understand how individuals make decisions (in particular, entrepreneurial choices) based on formal and

[7] Some works have analyzed this type of institution. For instance, Aidis et al. (2012), Baughn et al. (2006), Bruton et al. (2009), Busenitz et al. (2000), Chowdhury et al. (2015a, 2015b), and Estrin et al. (2013a), among others.

[8] For example, Aidis et al. (2008), Estrin and Mickiewicz (2012), Field et al. (2010), Levie and Autio (2008), Meek et al. (2010), Stephan et al. (2015), and van Hemmen et al. (2015), among others.

Table 1 Journals and published articles per year regarding institutions and entrepreneurship

Articles/year	1992–1996	1997–2001	2002–2006	2007–2011	2012–2016	Total	%
Small Business Economics	1	0	0	6	12	19	18.27
Journal of Business Venturing	2	1	0	6	5	14	13.46
Entrepreneurship Theory and Practice	1	0	2	3	3	9	8.65
International Entrepreneurship and Management Journal	0	0	0	3	4	7	6.73
International Small Business Journal	0	0	1	2	1	4	3.85
Journal of Business Research	0	0	1	0	3	4	3.85
European Journal of Law and Economics	0	0	0	0	3	3	2.88
Journal of Evolutionary Economics	0	0	0	1	2	3	2.88
Journal of International Business Studies	0	0	0	2	1	3	2.88
Journal of Small Business Management	1	0	0	0	2	3	2.88
Academy of Management Perspectives	0	0	0	0	2	2	1.92
Entrepreneurship & Regional Development	0	0	0	1	1	2	1.92
International Business Review	0	0	0	1	1	2	1.92
Journal of Economic Behavior & Organization	0	0	0	1	1	2	1.92
Journal of Technology Transfer	0	0	0	0	2	2	1.92
Research Policy	0	1	0	0	1	2	1.92
Technological Forecasting and Social Change	0	0	0	0	2	2	1.92
Academy of Management Journal	0	1	0	0	0	1	0.96
Academy of Management Review	1	0	0	0	0	1	0.96
American Behavioral Scientist	0	1	0	0	0	1	0.96
American Economic Review	0	0	0	1	0	1	0.96
Asia Pacific Journal of Management	0	0	0	0	1	1	0.96
Canadian Journal of Administrative Science	0	0	0	1	0	1	0.96
Cybernetics and Systems	0	0	0	0	1	1	0.96
Economic Modelling	0	0	1	0	0	1	0.96
European Journal of International Management	0	0	0	1	0	1	0.96
Feminist Economics	0	0	0	1	0	1	0.96
Journal of Comparative Economics	0	0	0	0	1	1	0.96
Journal of Financial Economics	0	0	1	0	0	1	0.96
Journal of International Management	0	0	0	0	1	1	0.96
Journal of Public Economics	0	0	0	1	0	1	0.96
Management Science	0	1	0	0	0	1	0.96
Organization Science	0	0	0	0	1	1	0.96
Public Choice	0	0	0	1	0	1	0.96
Regional Studies	0	0	0	0	1	1	0.96
Review of Development Economics	0	0	0	0	1	1	0.96
Review of Economics and Statistics	0	0	0	0	1	1	0.96
Service Industries Journal	0	0	0	1	0	1	0.96
Total	6	5	6	33	54	104	100

informal institutions, some scholars have tried to explore different measures of institutions in the field of entrepreneurship. In terms of formal institutions, North (1990) suggests that factors such as contracts, procedures, political structure, and property rights are associated with reductions in the transaction costs based on

Table 2 Theoretical framework used in articles

Theory	Articles	
	No.	%
Institutional approach	80	70.18
Contract theory	7	6.14
Occupational choice	6	5.26
Others	21	18.42
Total	114	100

regulations. In addition to studies that analyze regulatory issues[9], others look at procedures that are related to access to stock markets (Bruton et al. 2009), the financial system (Autio and Fu 2015; Klapper et al. 2006), hiring and firing rules and controls (Goltz et al. 2015; van Stel et al. 2007), political structure (specifically corruption) (Chowdhury et al. 2015a, b; Estrin et al. 2013a), democracy (Bruno et al. 2013), and government size and capability (De Clercq and Dakhli 2009; Estrin et al. 2013a, b). Finally, we found that including measures of property rights is less common in the literature (Chowdhury et al. 2015b). Authors such as Estrin et al. (2013a, b), Estrin and Mickiewicz (2012), Klapper et al. (2006), Nyström (2008), and Pathak et al. (2013) have tried to explain how this type of regulation fosters entrepreneurship given the idea of warranties to protect goods and services based on knowledge.

In terms of the informal institutional environment, as we mentioned before, North (2005) emphasizes the relevance of belief systems, social norms and culture, and cognitive dimensions in order to reduce the uncertainty caused by individual and group decisions. Regarding belief systems, the variable most used is role models, in which one entrepreneur knows another entrepreneur through the socialization process, which could influence choices related to entrepreneurial engagement[10], followed by welfare and society (Field et al. 2010; Kanniainen and Vesala 2005). With respect to social norms and culture, some variables such as control of corruption (Anokhin and Schulze 2009; Aparicio et al. 2016a) and community-wide normative

[9] See for instance Aldrich and Fiol (1994), Braunerhjelm et al. (2015),-Busenitz et al. (2000), Calcagno and Sobel (2014), De Clercq et al. (2010), Meek et al. (2010), Manolova et al. (2008), Spencer and Gómez (2004), Stenholm et al. (2013), and Valdez and Richardson (2013).

[10] Some of the works are Aidis et al. (2008), Bauernschuster et al. (2010), Estrin et al. (2013a, 2013b), Estrin and Mickiewicz (2012), Urbano et al. (2011), and Urbano and Alvarez (2014).

Table 3 Operationalization of formal and informal institutions in analyzed articles

Institution	Type	Articles	
		No.	%
Formal	Political structure	34	19.43
	Procedures-regulations	27	15.43
	Contracts	24	13.71
	Property rights	8	4.57
Informal	Social norms-culture	34	19.43
	Cognitive dimension[a]	26	14.86
	Beliefs systems	21	12.00
Others		1	0.57
Total		**175**	**100**

Note: Some articles use both formal and informal institutions, while others use either formal or informal to explain entrepreneurial activity

[a] It is worth noting that although we classify cognitive dimension as informal institution, Scott (2008, 2014) suggests that cultural-cognitive dimension or pillar relates the external world of stimuli and the response of the individual. Here, we believe that cognitive elements are directly sensitive to the primary socialization process, and therefore, those variables associated with this dimension are classified as informal institutions.

(Bruton et al. 2009; Sobel 2008), among others, were found. Cognitive dimensions such as confidence, motivation, and opportunity perception are used by Estrin and Mickiewicz (2012), Hafer and Jones (2015), and Levie and Autio (2008). As Thornton et al. (2011) suggest, informal institutions, although they are less dynamic, could impact entrepreneurship more than contracts, procedures, political structure, and property rights, which are related to formal institutions.

According to Blackburn and Kovalainen (2009) and Blackburn and Smallbone (2008), among others, entrepreneurship research has grown in terms of empirical evidence and stylized facts, which have been analyzed through different qualitative and quantitative methods. In this regard, all the previous variables were assessed by scholars in functions where the dependent variable is entrepreneurship (see Table 4 and Appendix 1 in the electronic supplementary material). The most prevalent estimation method used by the authors is linear regression (19.4%), followed by panel data (16.3%), binomial and multinomial techniques (logit and probit) (14.3%), single/multiple case studies and multilevel estimation (8.2%), structural equation models (6.1%), and descriptive statistics and hierarchical linear models (5.1%). We identify only two articles using instrumental variables

Table 4 Techniques used in analyzed articles

Methods	Articles		Author and year of publication
	No.	%	
Linear regression	19	19.39	Bauke et al. (2016), Collins et al. (2016), Davidsson et al. (2006), Davis and Williamson (2016), De Clercq and Dakhli (2009), Hafer and Jones (2015), Hechavarría (2016), Hoogendoorn et al. (2016), Huggins and Thompson (2016), Kanniainen and Vesala (2005), Klapper et al. (2006), Lerner et al. (1997), Sobel (2008), Stephan and Uhlaner (2010), Stephen et al. (2009), Uhlaner and Thurik (2007), Urbano et al. (2016a), Valdez and Richardson (2013), van Hemmen et al. (2015)
Panel data	16	16.33	Aidis et al. (2012), Anokhin and Schulze (2009), Aparicio et al. (2016a), Autio and Fu (2015), Belitski et al. (2016), Calcagno and Sobel (2014), Carbonara et al. (2016), Chowdhury et al. (2015a), Chowdhury et al. (2015b), Da Rin et al. (2011), Dutta and Sobel (2016), García-Posada and Mora-Sanguinetti (2015), Krasniqi and Desai (2016), Levie and Autio (2008), Meek et al. (2010), Nyström (2008)
Logit, probit, multinomial, ordered	14	14.29	Aidis et al. (2008), Audretsch et al. (2013), Eesley (2016), Estrin and Mickiewicz (2012), Freire-Gibb and Nielsen (2014), Gohmann (2012), Hopp and Stephan (2012), Krasniqi and Mustafa (2016), Lechner and Pfeiffer (1993), Maimone Ansaldo Patti et al. (2016), Román et al. (2011), Urbano and Alvarez (2014), Urbano et al. (2016b), Zhang (2015)
Single/multiple case studie(s)	8	8.16	Ben Letaifa and Goglio-Primard (2016), Fligstein (1997), Guerrero et al. (2014), Mair and Marti (2009), Toledano and Urbano (2008), Urbano et al. (2010, 2011), Welter and Smallbone (2008)
Multilevel estimation	8	8.16	Estrin et al. (2013a, b), Estrin and Mickiewicz (2011), Kibler and Kautonen (2016), Lim et al. (2016), Pathak and Muralidharan (2016), Stephan and Pathak (2016), Stephan et al. (2015)
Structural equation model	6	6.12	Guerrero and Urbano (2012), Kirby et al. (2011), Liñán et al. (2011), Manolova et al. (2008), Spencer and Gómez (2004), Stenholm et al. (2013)
Descriptive statistics	5	5.10	Aidis et al. (2007), Peng et al. (2010), Storey and Tether (1998), Watson and Everett (1996), Welter and Smallbone (2008)
Hierarchical (non)linear model	5	5.10	Baughn et al. (2006), Goltz et al. (2015), Hechavarria and Reynolds (2009), Pathak et al. (2013), Yeganegi et al. (2016)
Instrumental variables	2	2.04	Field et al. (2010), Hopp and Stephan (2012)
Others	15	15.31	Álvarez et al. (2014), Anokhin and Schulze (2009), Bjørnskov and Foss (2016), Bruno et al. (2013), Bruton et al. (2009, 2010), Busenitz et al. (2000), De Clercq et al. (2010), Hayton et al. (2002), Kim and Kang (2014), Kuckertz et al. (2016), Malchow-Møller et al. (2010), McGrath et al. (1992), Shane and Foo (1999), van Stel et al. (2007)
Total	98	100.00	

Note: Some articles use various methodologies, while others (not included) are merely theoretical

(2.0%). The rest of the techniques presented in Table 4 are classified as "others" (15.3%).

3.2 Linking entrepreneurship with economic growth

As mentioned previously, the number of articles selected to explain this relationship was 81, classified by three types: (a) empirical (57), (b) theoretical (16), and (c) introduction to special issues (8). As also mentioned, following van Praag and Versloot's (2007) work, these articles are concerned only with a country's or region's GDP (total or per capita), GDP growth, labor productivity, or total-factor productivity (TFP). In general, the hypotheses posit that entrepreneurship impacts

positively on economic growth, and the main findings support these hypotheses. Therefore, in our analysis, we focus on the results found by keywords, pointing out journals, years, authors, theoretical frameworks, and methods used to relate entrepreneurship with economic growth. Table 5 presents empirical and theoretical papers and also the introduction to special issues or editorials.

There is no doubt that the link between entrepreneurship and economic growth has been thoroughly analyzed (39 articles), whereas the relationship between entrepreneurship and sectorial growth reports only three articles. Regarding other approaches, this literature review reports that regional economic growth or development has been considered as a dependent variable, which could be explained by entrepreneurship. The number of articles found in both relationships was 16 and 12, respectively. Also, six articles deal with the relationship between entrepreneurship capital and regional economic growth and five articles are about entrepreneurship capital and national economic growth.

The authors who published the most articles focused on this relationship are Audretsch (16), Acs (seven), Keilbach (seven), and Urbano (six). Authors such as Braunerhjelm, Carree, Thurik, and van Stel have five articles; Desai, and Wennekers four; and Aparicio, Carlsson, Fritsch, Galindo, Guerrero, and Méndez have three. In total, 108 authors were found in this topic. The others have published one or two articles. Note that Audretsch has the most articles published and proposes (with Keilbach) the concept of entrepreneurship capital as a new variable in the Solow-Swan model.

Clearly, particular journals play a key role in the analyzed relationship; these include *Small Business Economics* (32.1% of the articles), followed by *Regional Studies* (7.4%), then *Annals of Regional Science* (4.9%), *Entrepreneurship & Regional Development*, *Industrial and Corporate Change*, and *Strategic Entrepreneurship Journal* (3.7%). The rest of the journals published one or two articles on this topic. It is interesting to note that among the articles whose main hypothesis is that entrepreneurship has effects on economic growth and regional development, most were published in the period 2012–2017, indicating that this relationship is a current research field of study by several scholars. Unlike to the previous topic, entrepreneurship and economic growth have called the attention of scholars since early 2000s. An example of this interest could be seen through the special issues, especially those published by *Small Business Economics* and *Regional Studies* (see Table 6 and Appendix 2 in the electronic supplementary material).

Table 5 Decision criteria for selecting papers

Criteria	No. of articles
Entrepreneurship and national economic growth	39
Entrepreneurship and regional economic growth	16
Entrepreneurship and regional economic development	12
Entrepreneurship capital on regional economic growth	6
Entrepreneurship capital and national economic growth	5
Entrepreneurship and sectorial growth	3
Total	81

The special issue that provides an opportunity to deeply explore the relationship between entrepreneurship and economic development was edited by Sternberg and Wennekers (2005). This special issue collects up-to-date research and introduces new empirical evidence using several approaches to entrepreneurship, specifically those based on the Global Entrepreneurship Monitor (GEM) dataset (van Stel et al. 2005; Wong et al. 2005). Also, special issues compiled by Acs and Storey (2004), Fritsch (2008), and Dejardin and Fritsch (2011) allow the possibility to discuss in depth the role played by entrepreneurship in the regional development process. Likewise, Acs and Szerb (2007), Acs et al. (2008a), and Naudé (2010) contribute to the literature by organizing special issues dealing with the public policy discussion that arises through the analysis of entrepreneurial activity and economic growth. Thus, the relationship between entrepreneurship and economic growth has been studied using different theoretical frameworks and methodologies.

Regarding to the theoretical frameworks, we find different approaches. The first approach uses a neoclassical economic growth theory that identifies those factors that affect economic growth in the short and long run. Authors such as Minniti and Lévesque (2010) use this theory to incorporate entrepreneurship behavior in the Solow-Swan growth model. Other authors such as Aparicio et al. (2016a), Audretsch and Keilbach (2004a, b, 2005, 2008), Bjørnskov and Foss (2013), González-Pernía and Peña-Legazkue (2015), and Iyigun and Owen (1999) assess the effect of entrepreneurship on economic

Table 6 Journals and published articles per year

Articles/year	1992–1996	1997–2001	2002–2006	2007–2011	2012–2016	Total	%
Small Business Economics	1	1	5	14	5	26	32.10
Regional Studies	2	0	4	0	0	6	7.41
Annals of Regional Science	0	0	1	0	3	4	4.94
Entrepreneurship & Regional Development	0	0	0	2	1	3	3.70
Industrial and Corporate Change	0	1	0	1	1	3	3.70
Strategic Entrepreneurship Journal	0	0	0	2	1	3	3.70
Entrepreneurship Theory and Practice	0	0	1	0	1	2	2.47
Journal of Business Venturing	0	0	0	2	0	2	2.47
Journal of Evolutionary Economics	0	0	1	0	1	2	2.47
Journal of Technology Transfer	0	0	0	0	2	2	2.47
Management Decision	0	0	0	0	2	2	2.47
Research Policy	0	0	0	1	1	2	2.47
Technological Forecasting and Social Change	0	0	0	0	2	2	2.47
World Development	0	1	0	0	1	2	2.47
Academic of Management Perspective	0	0	0	0	1	1	1.23
Econometrica	1	0	0	0	0	1	1.23
Economic Development Quarterly	0	0	0	0	1	1	1.23
Economy and Society	0	0	0	1	0	1	1.23
European Planning Studies	0	0	0	0	1	1	1.23
Growth and Change	0	0	0	1	0	1	1.23
International Small Business Journal	0	0	1	0	0	1	1.23
Journal of Economic Growth	0	1	0	0	0	1	1.23
Journal of Business Research	0	0	0	0	1	1	1.23
Journal of Development Studies	1	0	0	0	0	1	1.23
Journal of Monetary Economics	1	0	0	0	0	1	1.23
Journal of Business Economics and Management	0	0	0	0	1	1	1.23
Oxford Bulletin of Economics and Statistics	0	0	1	0	0	1	1.23
Oxford Review of Economic Policy	0	0	0	1	0	1	1.23
Papers in Regional Science	0	0	0	1	0	1	1.23
R & D Management	0	0	1	0	0	1	1.23
Futures	0	0	0	0	1	1	1.23
International Regional Science Review	0	0	0	0	1	1	1.23
Journal of Economics	0	0	0	0	1	1	1.23
Labour Economics	0	1	0	0	0	1	1.23
Total	6	5	15	26	29	81	100.00

growth through econometric techniques in a Solow-Swan specification. It is important to mention that this theory does not explicitly take entrepreneurship into account, because it is assumed in production decisions.

The theory that takes into account entrepreneurs and their behavior is Schumpeterian theory (Schumpeter 1911), which states that entrepreneurship encourages an innovation process that affects development. Some authors such as Agarwal et al. (2007), Audretsch et al. (2015a), Audretsch and Fritsch (2002), Biondi (2008), Bjørnskov and Foss (2013), Bosma et al. (2011), Carree et al. (2002, 2007), Low and Isserman (2015), Rocha (2004), Sternberg and Wennekers (2005), van Stel and Carree (2004), van Stel et al. (2005), Wennekers and Thurik (1999), and Wong et al. (2005) use this theory to

support the hypotheses that relate entrepreneurship not only with economic growth but also with economic development. This theory allows for the possibility to consider the role of entrepreneurship in growth and development processes and to also include, with theoretical support, entrepreneurship variables in growth models.

Taking into account new variables in the economic growth model supported in theoretical frameworks, it is possible to discuss an evolution of neoclassical growth theory, mentioned by Baumol (1993). According to this author, entrepreneurship can be considered an important driver of growth in both the short and long run. Using this idea plus previous approaches, the number of published articles increases considerably because since that time many authors have tested their hypotheses with the most structured theory of growth. Thus, authors such as Acs and Szerb (2007), Acs et al. (2012), Audretsch and Keilbach (2008), Braunerhjelm and Henrekson (2013), Fritsch (2008), Giordani (2015), Gries and Naudé (2010), Hessels and van Stel (2011), Mueller (2007), Noseleit (2013), Stephens and Partridge (2011), and Valliere and Peterson (2009), among others, prove the link between entrepreneurship and economic growth supported by endogenous growth theory. However, Audretsch and Keilbach (2004b, 2005, 2008), who use both neoclassical growth theory and endogenous growth theory, claim the importance not only of relating entrepreneurship with economic growth but also the relevance of the context in which this relationship occurs.

Those authors that argue for institutions to consider the context that enhances new firms to positively affect economic growth use institutional economic theory. Baumol and Strom (2007) and Naudé (2010) discuss the importance of this theory. Regarding their discussion, the next step to understanding the link between entrepreneurship and economic growth is through institutions (Aparicio et al. 2016a). In this sense, Bjørnskov and Foss (2013) introduce institutions, specifically regulative institutions, into the production function. Also, Liñán and Fernandez-Serrano (2014) assess the interaction between culture and entrepreneurship, which explains the growth differences across European countries. Overall, these recent articles show that institutional theory apparently is quite an important framework for understanding the relationship between entrepreneurship and economic growth (see Table 7).

Table 7 Theoretical framework used in articles

Theory	Articles	
	No.	%
Neoclassical economic growth theory	11	12.22
Schumpeterian theory	20	22.22
Endogenous growth theory	29	32.22
Economic development theory	3	3.33
Institutional economic theory	11	12.22
Other	16	17.78
Total	90	100

If most articles use neoclassical economic growth theory, Schumpeterian theory, or endogenous growth theory, we expect a priori that the methodology most used is the time series, because the Solow-Swan model requires a short- and long-run analysis. However, the literature review reports that other types of methodologies are used in order to analyze the relationship between entrepreneurship and economic growth. According to Wooldridge (2010), depending on data, researchers use cross section, time series, or panel data, which have different techniques of estimation. We show in Table 8 the type of data and the technique used by each author(s). Table 8 also shows not only traditional econometrics techniques used but also spatial econometrics and qualitative methods.

The techniques used by authors most often are based on cross section, panel data, and time series datasets, with 17, 19, and 9 articles, respectively. Indeed, it is interesting that some authors identify endogeneity problems in their models. Therefore, some of them apply three-stage least-square (3SLS) (Audretsch and Keilbach 2004c, 2008) and instrumental variables (IV) (Stephens and Partridge 2011) in cross section analysis. In terms of time series approach, models based on estimations techniques such as autoregressive models (AR) (Carree and Thurik 2008; Johnson and Parker 1996), least absolute deviations (LAD) (Berkowitz and DeJong 2005), and two-stage least-square (2SLS) (Berkowitz and DeJong 2005; Bjørnskov and Foss 2013) were also found. Also, dynamic panel data (Dejardin 2011), 2SLS or 3SLS in panel data (Aparicio et al. 2016a; González-Pernía and Peña-

Table 8 Statistical techniques used in analyzed articles

Type of data[a]	Technique	Articles		Author(s)
		No.	%	
Time series	OLS	3	33.33	Blanchflower (2000), Bjørnskov and Foss (2013), Hessels and van Stel (2011).
	AR	2	22.22	Carree and Thurik (2008), Johnson and Parker (1996).
	2SLS	2	22.22	Berkowitz and DeJong (2005), Bjørnskov and Foss (2013).
	Difference equations	1	11.11	Iyigun and Owen (1999).
	LAD	1	11.11	Berkowitz and DeJong (2005).
Cross section	OLS	10	58.82	Audretsch and Fritsch (2002), Audretsch and Keilbach (2004a, b), Audretsch and Keilbach (2005), Davidsson et al. (1994), Díaz Casero et al. (2013), Liñán and Fernandez-Serrano (2014), Noseleit (2013), Stephens and Partridge (2011), Wong et al. (2005).
	Descriptive statistics	5	29.41	Acs et al. (2008a), Acs et al. (2008b), Braunerhjelm and Henrekson (2013), Fritsch (2008), Valliere and Peterson (2009).
	2SLS/3SLS	2	11.76	Audretsch and Keilbach (2004c), Audretsch and Keilbach (2008).
	IV	1	5.88	Stephens and Partridge (2011).
Panel data	Random/fixed effects, IV, 2SLS, 3SLS, EGLS, threshold, dynamic	11	57.89	Acs et al. (2012), Aparicio et al. (2016a), Aubry et al. (2015), Audretsch et al. (2015a), Braunerhjelm and Borgman (2004), Carmona et al. (2016), Carree et al. (2007), Dejardin (2011), González-Pernía and Peña-Legazkue (2015), Méndez-Picazo et al. (2012), Urbano and Aparicio (2016).
	OLS	7	36.84	Bosma et al. (2011), Carree et al. (2002), Mueller (2007), Noseleit (2013), Prieger et al. (2016), van Stel and Carree (2004), van Stel et al. (2005).
	FGLS	1	5.26	Acs et al. (2012).
Pooling data	OLS	2	33.33	Belitski and Desai (2016), Braunerhjelm et al. (2010).
	GLS/2SLS/3SLS	3	50.00	Braunerhjelm et al. (2010), King and Levine (1993), van Oort and Bosma (2013).
	AR	1	16.67	Braunerhjelm et al. (2010).
Mathematical economics	ME	4	100	Giordani (2015), Gries and Naudé (2010), Huggins and Thompson (2015), Minniti and Lévesque (2010).
Spatial econometrics	GLS	3	100	Audretsch and Keilbach (2007), Capello and Lenzi (2016), Low and Isserman (2015).
Structural Equation Model	SEM	3	100	Audretsch et al. (2008), Guerrero et al. (2015), Guerrero et al. (2016a).
Partial least square	PLS/fsQCA	2	100	Castaño-Martínez et al. (2015), Castaño et al. (2016).
Qualitative	Case study	2	100	Etzkowitz and Klofsten (2005), Urbano and Guerrero (2013).
Descriptive statistics	Median/Frequency	1	100	Chang and Kozul-Wright (1994).
System dynamics	SD	1	100	Aparicio et al. (2016b).
Total		**67**		

Note: Some articles use various methodologies, while others (not included) are merely theoretical

[a] There are 9 articles using time series, 17 cross section, 19 panel data, 6 pooling data, 4 mathematical economics, 3 spatial econometrics, 3 structural equation model, 2 partial least square, 2 qualitative technique, 1 descriptive statistics, and 1 system dynamics. Each percentage was computed taking into account total articles per type of data

Legazkue 2015, and random/fixed effects[11] were identified.

Throughout the empirical assessment and theoretical discussions, it is possible to draw some interesting conclusions. For instance, Iyigun and Owen (1999) presented an endogenous growth model by which individuals choose to increase either their human capital or their experience through entrepreneurial activity. The authors found that both decisions positively affect economic growth. Also, Wennekers and Thurik (1999) presented a literature review on the benefits of entrepreneurship, not only as a direct driver of growth but also as a conduit for knowledge and innovation. Blanchflower (2000) used self-employment as a proxy for entrepreneurship to analyze its determinants and effects on the economic growth of OECD countries in the period 1966–1997. This author found a negative relationship between entrepreneurship and economic growth. Following that, Carree et al. (2002) established the hypothesis that the relationship between these two variables has a U-shaped form. Countries with low-income levels have high self-employment rates; medium-income countries present low self-employment rates; more developed economies have self-employment rates that are higher than medium-income economies but lower than those of developing economies. In summary, there are hypotheses about the effects of entrepreneurship and economic growth, as well as about the U-shaped curve that show the different relationships with economic development, depending on the stage of each country.

Regarding the regional level, another hypothesis was identified that posits how entrepreneurship affects regional economic growth. Indeed, Audretsch and Fritsch (2002), Audretsch and Keilbach (2004a, b, c, 2005), Dejardin (2011), González-Pernía and Peña-Legazkue (2015), Müller (2016) and Noseleit (2013) used regional data to find that there is a positive impact of entrepreneurship on regional economic growth. Berkowitz and DeJong (2005), Mueller (2007), Yu (1998) and Stephens and Partridge (2011) tested this hypothesis in other regions and found similar results. This could indicate that the effects of entrepreneurship are robust at both the national and regional levels. Most of these studies have focused on European regions (e.g., Germany, Belgium, Spain, Sweden), as well as Canada and the USA. In this sense, geography plays a role in this relationship and helps make it possible to understand not only economic growth but also economic development. This is another type of hypothesis found in the literature review. For instance, some studies such as those by Acs and Szerb (2007), Carree et al. (2002, 2007), Liñán and Fernandez-Serrano (2014), and van Stel and Carree (2004) related entrepreneurship to economic development (GDP per capita) depending on the stage of development. Additionally, it has been found that entrepreneurship plays a useful role as a conduit of knowledge spillover that positively affects economic growth[12].

3.3 Institutions, entrepreneurship, and economic growth

From the previous section, two results suggest further analysis. First, among other conceptual works in the field of entrepreneurship,[13] this article suggests that the institutional approach has gained relevance in the sense that it seems an appropriate framework for understanding the factors that encourage or discourage entrepreneurial engagement across countries and regions. Indeed, on the one hand, authors such as Aidis et al. (2008), Chowdhury et al. (2015a, b), Goltz et al. (2015), and Urbano and Alvarez (2014), among others, have applied explicitly the institutional approach (North 1990, 2005) to understand the institutional matrix in which individuals become entrepreneurs. On the other hand, authors such as Aidis et al. (2012), Bruton et al. (2009), De Clercq et al. (2010), and Gnyawali and Fogel (1994), among others, have implicitly followed the institutional approach. Second, even though the relationship between entrepreneurship and economic growth follows the Schumpeterian theory or endogenous growth theory, some authors have used the institutional approach to understand the link between these two variables (Baumol and Strom 2007; Bjørnskov and Foss 2013). These two facts indicate that, using the same framework, two separate perspectives of entrepreneurship research could be used to analyze together such a sequence in which entrepreneurship could play a crucial role.

[11] See for example Aubry et al. (2015), Audretsch et al. (2015a), Bosma et al. (2011), Braunerhjelm and Borgman (2004), and van Stel et al. (2005).

[12] Some of the works conducting this analysis are Acs et al. (2008b, 2012), Agarwal et al. (2007), Audretsch (2007), Audretsch and Keilbach (2004a, 2008), and Noseleit (2013).

[13] For instance, Bruton et al. (2010), Thornton et al. (2011), Veciana and Urbano (2008), and Welter and Smallbone (2008, 2011), among others.

Theoretically, North (1990, 2005) asserts that institutions matter for explaining the differences in growth and development across regions and countries. However, we base our analysis on the ideas of Acemoglu et al. (2014), Baumol (1990), Bjørnskov and Foss (2016), North and Thomas (1973), and Rodrik (2003) about entrepreneurship as a conduit of institutions to achieve economic growth. In this sense, it is important to highlight the role of institutions in entrepreneurship, on the one hand, and how entrepreneurial activity influenced by institutions plays a key role in the growth process, on the other (Sobel 2008). The first one was documented using several articles, whose main results indicate that formal and informal institutional factors encourage or discourage the entrepreneurial behavior. In fact, informal institutional factors tend to impact higher and more positively on entrepreneurship than formal factors, as Thornton et al. (2011) suggest. The second one is more implicit. Although authors such as Amorós et al. (2012) and Terjesen and Amorós (2010) relate institutions to the stage of economic development in order to explain entrepreneurial activity in emerging economies, they still leave space to keep exploring the differentiated impact of institutions on entrepreneurship and this factor on economic growth. A similar analysis is presented by Carree et al. (2002, 2007), who find that business ownership has a U-shaped relationship with economic growth. Nevertheless, van Stel et al. (2007) have studied the effect of business regulation on nascent and established entrepreneurs, whose decisions regarding regulation depend on the political legacy and the economic development stage. Some important conclusions can be derived from these works: (a) there is a correlation between institutions and economic development; (b) given the capacity and efficiency to create norms and laws, entrepreneurial activity will increase or decrease; therefore (c) entrepreneurship will have a greater impact in some regions and countries than in others.

From another perspective, authors such as Audretsch (2007), Audretsch and Keilbach (2004a, b, 2005, 2007), Audretsch et al. (2008), and Urbano and Aparicio (2016) explore the last conclusion assuming that institutions affect the rate of entrepreneurship capital. They find that effectively this factor impacts positively on economic growth, but at the same time, they claim that more studies are needed to understand better how entrepreneurship capital is configured concerning the institutional context. Even more, they recommend future research that would study entrepreneurship capital, considering the effect of institutions. Hence, institutional factors can be an accurate framework in which entrepreneurship and economic growth interact (Audretsch et al. 2008). Some empirical evidence is presented by Bjørnskov and Foss (2013) and Nissan et al. (2011), who find that legal institutions (procedures or the time to create a new business) affect economic growth. Nevertheless, as Baumol and Strom (2007) and Audretsch and Keilbach (2004a, b) have discussed, it is important to understand 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 this sense, institutions and economic growth are linked through entrepreneurship. Hence, those institutions shaping entrepreneurial behavior have a vital influence on the growth and innovation that characterizes each economy. At the same time, institutions (formal and informal) motivate those individuals with innovative ideas to set up new businesses and therefore contribute to economic growth and development.

The previous discussion suggests, therefore, that the two separate perspectives could be analyzed together, which could enhance the understanding of the complex system involved in the economic growth process. Thus, as Audretsch and Keilbach (2008) suggest, simultaneity between institutions, entrepreneurship, and economic growth is required. On the one hand, the institutional approach offers a comprehension of the determinant institutional environment in which entrepreneurs make decisions for themselves and the entire society, leading to a growth process. On the other hand, because of interaction and interdependence involving high complexity, a unidirectional model will lead to biased results. Therefore, it is worth considering simultaneously the impact of the institutional context on entrepreneurial activity and this variable on economic growth. The virtue of this approach is not only in the correction of the statistical bias. By explicitly instrumenting entrepreneurship in a second equation, we are able to analyze how policy could actually influence economic growth by generating more entrepreneurial activity.

In order to complement the graphical representations of the above results, we developed a correspondence analysis. These correspondences allow associations and similarities (Hoffman and Franke 1986) to be explicitly analyzed and identified in publications dealing with both relationships. For example, we initially examined whether it was possible to establish a statistically

significant association between the statistical techniques used in the articles and both relationships presented in the previous section (i.e., entrepreneurship/entrepreneurship-economic growth). The results indicated that the X^2 is 34.66 with 8 degrees of freedom and is significant at 0.000. Therefore, we concluded that there is a statistical association between the statistical techniques and the focus of each relationship.

Likewise, we explored the relationship between the technique and the theoretical framework used. The results indicated that the X^2 is 83.76 with 64 degrees of freedom and is significant at 0.049. Therefore, we concluded that there is a statistical association between these two categories. A graphical representation helps to visualize this relationship. Figure 2 presents the scatter diagram between the technique and theoretical framework. For each variable on the graph, the distances between the category points reflect the relationship between the categories, with similar categories being closer to each other. Figure 2 shows that occupational choice, contract theory, and social capital theory are more associated with the structural equation model and discrete choice model (logit, probit, and so on); institutional theory is related to multiple regression in which simultaneous equations have been used; neo-classical growth theory, endogenous growth theory, and Schumpeterian theory are associated with time series techniques; while development economic theory is related to descriptive and multivariate statistics.

From Fig. 2, one might suggest that future research should align highly advanced techniques to understand both the effect of institutions on entrepreneurship and the consequences of entrepreneurial activity on economic performance. This could imply that further analysis at the individual level and grounded upon occupational, contract, social

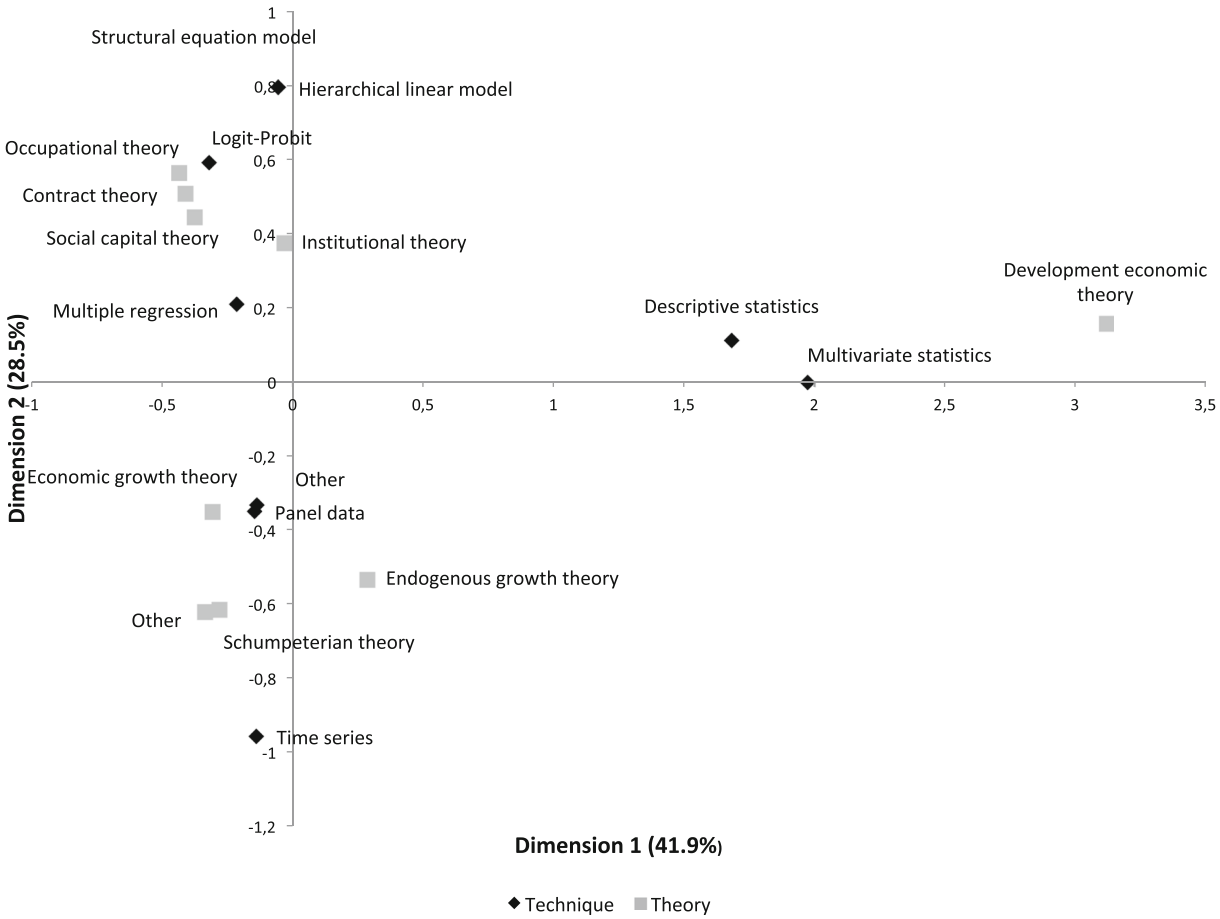

Fig. 2 Technique vs. theoretical framework

capital, and institutional theory needs to include a multilevel approach that captures the nearest and furthest socialization processes (Urbano and Alvarez 2014). Since GEM data has a cross section structure, empirical analysis and different insights can be obtained by applying multilevel estimations or pseudo-panel models. At the country level, Fig. 2 may suggest that studies analyzing economic development need undoubtedly the time dimension as long as a dynamic exploration is involved. Nowadays there are more opportunities for conducting time series analysis since year after year information on entrepreneurship is being gathered. In the case of panel data, the pioneering work by Ács et al. (2014) suggests that new data is emerging to explore how institutions, entrepreneurship, and economic development are recursively linked (e.g., the project called the global entrepreneurship and development index—GEDI). Although the micro data is not publicly available (as GEM), a cross-country analysis can be perfectly carried out. Thus, further tools are emerging to conduct future research that combines institutional analysis as an antecedent of entrepreneurship and economic growth.

Finally, we also found a statistically significant association of 0.000 (X^2 is 298.35 with 90 degrees of freedom) between the different dependent and independent variables identified in the empirical papers (see Appendix 1 and Appendix 2 in the electronic supplementary material). This association shows a clear relationship between different measures of institutions, entrepreneurship, and economic growth, which indicates that these types of variables are closely related. Only self-employment and total factor productivity are separated from the rest of the measures.

4 Conclusions and future research

Entrepreneurship research has evolved rapidly since its origins (Blackburn and Kovalainen 2009; Carlsson et al. 2013). According to the literature studied in the current article, on the one hand, some scholars have analyzed the determinants that encourage entrepreneurial activity. On the other, entrepreneurship research has focused on the effects of new business creation. The first issue has been studied under psychological, organizational, institutional, and economic lenses[14]. The second issue could be explored using an institutional or economic framework.

In this article, a systematic literature analysis based on an institutional approach was conducted. Using the idea that institutions shape human behavior in order to enhance economic growth, we explored the papers that analyze how institutional factors through entrepreneurial activity affect economic growth. We studied those articles within the Web of Science in the period 1992–2016, focusing on the relationships between institutions and entrepreneurship and entrepreneurship and economic growth. Thus, not only is understanding both complex relationships and their possible consequences helpful for advancing and providing new insights in these complementary research fields, but it is also useful for formulating public policies, particularly strategies that reinforce the sustainable creation of new businesses that effectively enhance economic performance and provide well-being, not only for the entrepreneurial firms but also for the entire society.

With respect to the theoretical frameworks used in both relationships, we found the predominance of an institutional approach, which increased remarkably during the period 2012–2016. Through quantitative and qualitative techniques, the authors conclude that institutions affect entrepreneurship, but informal institutions have a higher and more positive effect than formal institutions. Although most of them applied either explicitly or implicitly North's ideas about institutions in the field of entrepreneurship, some scholars have used different approaches such as Scott's (2008, 2014) institutional dimensions or pillars (regulative in terms of formal institutions, normative in terms of informal institutions, and cultural-cognitive—this dimension relates the external world and the individual). Regarding the impact of entrepreneurial activity on economic growth, we

[14] Apart from the institutional and economic approaches considered in this article, perspectives that involve psychological (Collins et al. 1964; McClelland 1961; Krueger 1993 and Krueger and Brazeal 1994; Shepherd 2015; among others) and organizational (Alvarez and Busenitz 2001; Barney 1991; Barney et al. 2001; Chesbrough 2003, 2006; Leih and Teece 2016; Teece et al. 1997; Teece 2007; among others) approaches are also used in our field of research. However, some studies are starting to consider another level of analysis, just between the organization and the environment; this type of analysis, the entrepreneurship-innovation ecosystems approach, mainly focuses on clusters, business-innovation, or industry (Isenberg 2010; Mason and Brown 2014, among others).

found that neo-classical economic growth theory is used in the majority of the articles. In the analyzed papers, different measures of entrepreneurship and economic growth have been employed, concluding that in general there is a positive effect of entrepreneurship on economic growth. Likewise, authors such as Bjørnskov and Foss (2013) and Nissan et al. (2011) found that institutions also affect economic growth, as North (1990, 2005) highlights. However, the discussion about the direct or indirect effect of institutions on economic growth was carried out by Acemoglu et al. (2014), Baumol (1990), North and Thomas (1973), and Rodrik (2003), who conclude that institutions affect economic growth through endogenous factors, such as entrepreneurship and industrial development. Following this idea, Aparicio et al. (2016a), Audretsch and Keilbach (2004a, b), Audretsch et al. (2008), Bjørnskov and Foss (2016), Terjesen et al. (2016) and Baumol and Strom (2007) discuss that it is important to understand how institutions affect entrepreneurial activity and therefore make it possible to identify how entrepreneurship and economic growth interact in different institutional environments (culture, beliefs, social values, etc.). In this sense, although Bjørnskov and Foss (2016) conduct a similar literature analysis, this paper might be complimentary through the idea that informal institutions are more relevant for explaining entrepreneurial activity and its economic consequences. Additionally, as Bjørnskov and Foss (2016) discussed, entrepreneurial actions need certain conditions. In this regard, our approach suggests the social norms, culture, and so on are the primary factors that create such conditions.

Therefore, some research questions persist in seeking an understanding of the role of entrepreneurship in the field of economic growth. In this context, an institutional approach can be crucial in order to include institutions as a key variable in the analysis. Then, simultaneous identification is required to understand the dynamic relationship between institutions, entrepreneurship, and economic growth in the short and long term. In particular, we identified that property rights (formal institutions) and the belief systems (informal institutions) should be further analyzed, since there is still a scarcity of evidence dealing with these types of institutions. Among those few authors who have analyzed these institutional factors, Czarnitzki et al. (2016) claim that studies on property rights are needed since the rapid explosion of entrepreneurs must be balanced in order to encourage innovative entrepreneurship (as productive entrepreneurship) rather than unproductive entrepreneurship. In terms of informal institutions, Audretsch et al. (2013) and Hoogendoorn et al. (2016) suggest that the belief systems such as religion are important elements for understanding the differences of entrepreneurship across countries, and therefore, more studies are needed to provide a broader perspective. Also, the interplay between entrepreneurship and institutions, where a bidirectional relationship takes place, needs further research. Institutions shape entrepreneurship, but at the same time, entrepreneurs tend to affect institutions (Elert and Henrekson 2017). In addition, we noticed that measures of entrepreneurship that were not considered in the current paper could improve the comprehension on the evolution of this research field. For instance, intrapreneurship or corporate entrepreneurship, analyzed from the institutional perspective, could serve to study how entrepreneurs within firms are shaped by the institutional environment[15].

Similarly, future research might consider the question of how and why the diversity in entrepreneurship research is particularly important for economic growth through different institutional conditions. Some poignant examples of this diversity include female entrepreneurship (Ahl and Marlow 2012; Collins and Low 2010; De Bruin et al. 2007; Minniti and Naudé 2010), social entrepreneurship (Acs et al. 2013; Nicholls 2010; Zahra et al. 2009), immigrant and transnational entrepreneurship (Collins and Low 2010; Drori et al. 2009; Li et al. 2017), entrepreneurial universities (Guerrero et al. 2016b; Wennberg et al. 2011), family business (Chrisman et al. 2010; Cruz et al. 2012; Debicki et al. 2009; Van Gils et al. 2014; Zahra et al. 2008), green or sustainable entrepreneurship (Dean and McMullen 2007; Gast et al. 2017; Shepherd et al. 2013), entrepreneurial growth aspirations (Autio and Acs 2010; Estrin et al. 2013a), etc. Due to data limitations and the lack of strong theoretical approaches, this type of distinction has not often been made yet in the empirical literature. With regard to economic growth, Alvarez and Barney

[15] See for instance Gómez-Haro et al. (2011), Ribeiro-Soriano and Urbano (2009), Toledano et al. (2010), Turró et al. (2014), and Turro et al. (2016).

(2014), Blackburn and Ram (2006), Bruton et al. (2013), Carter (2011), and McMullen (2011) discuss the importance of entrepreneurship to explain not only the economic performance but also inclusive growth, well-being, social mobility, and the alleviation of poverty. These authors suggest that future research directions should link entrepreneurial activity to measures beyond the traditional GDP, since it is recognized that entrepreneurship brings benefits for the whole society. According to Welter et al. (2017), there are particular austerity demands concerning the government budget constraints, impeding to reactivate the economic level of regions and nations, which result in a reduced inclusive growth outcome. Thus, entrepreneurial diversity may serve as a policy instrument to connect those excluded households with economic dynamics.

Those factors analyzed in this literature review plus some additional elements may be considered by scholars in entrepreneurship research in order to push out the extant frontier, framed of course, by the causal chain running from institutions and entrepreneurship to economic growth. This causal chain might serve to depict the growth and development process across regions and countries. In each of these two levels, future research and public policies should consider that local and national differences may exist. In this regard, as identified in this literature analysis, further policy reports and articles are needed. These should address the question about what are the conducive institutions in developing and developed countries such that entrepreneurship leverages the economic development process. Certainly, there are different trends depending on the context in which entrepreneurs make decisions (Beynon et al. 2016). For instances, Bruton et al. (2013) and De Castro et al. (2014) discuss the challenge in terms of the unofficial economy confronting developing countries, which, despite such challenges, individuals still decide to become entrepreneurs. In one way or another, this is the labor market structure that shapes the entrepreneurial intentions and decisions, which perhaps represent the best (short-term) solution for those families living in emerging economies (Bruton et al. 2012). Thus, new insights could tackle the fact that institutions (mainly the formal ones) exert lower influence on entrepreneurial activities formally registered. In this sense, an analysis of informal institutions, encouraging (direct and indirectly) both formal institutions and higher quality of entrepreneurship, is needed.

In the developed country context, the analysis of the causal chain suggests an important tool to analyze the recent crises. First, the huge immigrant flows from developing to developed countries (Bizri 2017; Collins and Low 2010) and, second, the still unstable economic platform of the USA, UK, and Europe (Giotopoulos et al. 2017; Koellinger and Thurik 2012; Varvarigos and Gil-Moltó 2016), among other types of crises, create opportunities for entrepreneurship scholars to provide compelling evidence and a broader debate regarding the importance of entrepreneurial activity as a policy last resort. Ács et al. (2014) and Acs et al. (2017) recognize that the national system of entrepreneurship is a new way to comprehend the functioning of the economic process, leveraged by entrepreneurs who are, at the same time, embedded in a particular environment. In particular, Ács et al. (2014) have introduced new metrics of entrepreneurial activity and economic development called the GEDI, which understand entrepreneurship as a system. Measurement advances like this offer ways forward to explore in depth institutions, entrepreneurship, and economic development at the individual, regional, and country level, facilitating at the same time the creation of long-term policies.

Both conceptual and policy implications could be derived from this paper. First, to consider an integrated model including institutions, entrepreneurship, and economic growth could advance research in the entrepreneurship and economic fields. Also, this model permits distinguishing by type of institution (formal, informal, etc.), entrepreneurial activity (necessity, opportunity, etc.), and economic performance (growth, development, etc.). Second, this study is useful for formulating strategies and public policies, particularly those strategies that reinforce the sustainable creation of new businesses that enhance the standard of living for not just the entrepreneurs but also the entire society.

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