

## **An overview of the economics of entrepreneurship and small business: The legacy of David Audretsch**

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**Abstract:** Few scholars can be considered beacons who guide interested (and often disoriented) researchers. David Audretsch is one such scholar, who has shed light on entrepreneurship in a broad sense as well as on the economics of entrepreneurship and small business as a distinct field. Given his noteworthy and abundant contributions, a synthesis is required in order to understand the evolution of entrepreneurial thought from an economics perspective. Based on searches using Google Scholar and Web of Science (WoS), we therefore aim to quantitatively and analytically examine Audretsch's contributions to the economics of entrepreneurship and small business. We employ bibliometric indicators to identify his seminal and most cited articles. We also use keywords analysis and co-occurrence to identify his key concepts over the years. Complementing this general view, we analyze the content of numerous publications that highlight the ways in which the economics of entrepreneurship and small firms has evolved. Suggestions for future research are also provided, which may prove useful for economists and specialists in related areas in order that the field may continue to advance.

**Keywords:** David Audretsch, Economics of entrepreneurship and small business, Bibliometrics, Literature analysis.

### **1. Introduction**

The field of entrepreneurship and small business research is young but rapidly growing. Carlsson et al. (2013) and Landstrom (1999) have commented on the discipline's fortunes since its origins, as entrepreneurship and small business studies have been viewed and analyzed from various scientific perspectives. Indeed, fields including (but by no means limited to) economics, sociology, geography, anthropology, management, and psychology have contributed to the expansion of entrepreneurship as a research field. Within each science, outstanding scholars have emerged through their devotion and hard work. As an example, every year the Swedish Entrepreneurship Forum (Entreprenörskapsforum), the Research Institute of Industrial Economics (IFN), VINNOVA, and the Stockholms Köpmansklubb offer an award to scholars who have particularly contributed to the development of entrepreneurship and small business research.

In 2001, David Audretsch and Zoltan Acs received the Global Award for Entrepreneurship Research. From an economics perspective, these researchers have shaped our understanding of the creation of new ventures and their importance for economic development. The career of David Audretsch has demonstrated his considerable impact, not only in entrepreneurship and small business research, but also in economics as a whole. For instance, Linß (2014) has highlighted Audretsch's academic influence by analyzing the 60 most important economists from Aristotle to Paul Romer. Accordingly, Audretsch has explored related topics such as innovation in large and small companies, industry development, entrepreneurship and firm growth, competitiveness, economic growth and development, and public policy. As an example, an important concept emerged thanks to Audretsch and Keilbach (2004), in which entrepreneurship is considered an additional capital that spurs economic growth. As such, his contributions span a broad spectrum of areas that have helped consolidate entrepreneurship and small business research in terms of theory, practice and policy.

Therefore, we aim to quantitatively and analytically examine his contributions to the economics of entrepreneurship and small business from 2007 until 2018 (July). To this end, our research combines different tools to gather and analyze his papers in several journals, as well as his books and chapters written with coauthors. First, an overview is provided via bibliometric analysis. This consists of capturing quantitative trends through analyzing his publications, most representative works, citations, co-citations and so forth. According to Landström et al. (2012), such techniques can uncover connections between scholars and their research agendas. It is also argued that through bibliometrics it is possible to obtain an overview of any discipline (Broadus, 1987). In this regard, in order to shed light on recent advances in economics entrepreneurship and small business research, bibliometric indicators including the number of publications, number of citations, keywords and connections are analyzed, facilitating the development of conclusions according to the specific parameters studied (Merigó et al., 2016). Second, the bibliometric results are combined with content analysis in order to understand concept development, scope and future research derived from Audretsch's contributions. The most cited papers and recently published works of an author may help define the research field and the salient agenda that continues to advance the knowledge frontier. In this regard, Landström et al. (2012) have demonstrated how Audretsch joined other scholars in building knowledge, especially after 2000. Here the importance of Audretsch and his peers' works is recognized as a basis to entrepreneurship and small business theory.

This paper is based on searches using Google Scholar and Web of Science (WoS), which are widely regarded as the most influential databases because they only index well-recognized academic journals and editorials (Harzing & Alakangas, 2016). By using the keyword "Audretsch, D\*" in the author profile (Google Scholar) or author search option (WoS), we obtained information regarding his academic production. We opted to consider articles (especially those pertaining to research, editorial notes and book reviews), books and book chapters. Based on this information, we analyzed the most representative papers that can be considered seminal works and mark significant trends in different areas of the field. From Google Scholar we attained information regarding 155 publications and analyzed their content. We used the title, abstract and introduction to identify how each document may explain different questions related to the economics of entrepreneurship and small business. Overall, the results enabled us to understand the emergence and evolution of economics of entrepreneurship and small business research as a discipline, increasing our understanding of competitiveness and industrial development (first), and institutions and economic development at national and regional levels (second). Innovations in small versus large firms represented a key component of Audretsch's analysis (cf. Acs & Audretsch, 1988), providing the basis for small business and entrepreneurship (as a capital input) (Audretsch & Keilbach, 2004), knowledge spillover theory of entrepreneurship (Acs et al., 2013), entrepreneurial society (Audretsch, 2007), and other widely used concepts and theories.

The remainder of this chapter proceeds as follows. Section 2 explores the concept of the economics of entrepreneurship, including the definitions and approaches discussed by different authors. Section 3 presents the results of the bibliometrics and content analysis. Finally, Section 4 concludes and discusses future research directions.

## **2. The economics of entrepreneurship and small business**

It has been suggested that the research basis of entrepreneurship stems from Schumpeterian analysis of economic development (Carlsson et al., 2013). Indeed, Schumpeter (1911) placed entrepreneurs at the center of economic activity. Although his analysis started from a general equilibrium perspective, he went beyond by suggesting that entrepreneurs create shocks to push up the steady state. The rationale behind Schumpeter's coining of the concept of "entrepreneurs" was that such individuals bring innovations to the market, simultaneously stimulating different cycles in the economy. Since then, entrepreneurs (individuals) and entrepreneurship (actions) have gained considerable relevance in academia and have become significant subjects of study.

Various outstanding economists have considered Schumpeter's ideas, which were published in the *Journal of Evolutionary Economics*. For instance, Samuelson (2015, p. 34) has stated that "what will ever be remembered was his [Schumpeter] now century old emphasis on entrepreneurial innovation as a cardinal catalyst for economic progress". In essence, economists have recognized that entrepreneurship and entrepreneurs are fundamental agents within economic analysis. Although Schumpeter's ideas scarcely seemed sufficient to explaining economic development, Audretsch (2015, p. 213) has suggested that "in the end, though, it is Schumpeter's scholarship, and certainly his analysis of innovation, entrepreneurship and creative destruction, that has stood the test of time."

In spite of this recognition, Audretsch et al. (2016, p. 1) have claimed that even though entrepreneurship is studied from different disciplines, economists have been less tempted than scholars from management, sociology and finance to further explore entrepreneurial activity. Baumol (1968) has discussed the absence of entrepreneurs even from the theory of the firm, which was dedicated to understanding the profit maximization process. Based on Schumpeter's ideas, Baumol (1968) has suggested that the analysis of entrepreneurship serves to comprehend why some shifts occur. He has adduced these changes not to external shocks, but to the ability and leadership of entrepreneurs, who are capable of introducing innovations. Minniti (2016) has developed these ideas by asking Baumol to expand upon how entrepreneurs are important agents in the economy, and therefore worthy of attention from economists. Based on their microeconomic behavior, entrepreneurs are innovative, enabling firms to improve their performance, whereas the aggregated outcome leads to greater economic growth. Minniti (2016) has also highlighted Baumol's ideas regarding the importance of institutions to foster entrepreneurship, connected with economic development. Accordingly, from institutional economics (North, 1990, 2005) it is possible to understand the environment in which entrepreneurs behave to spur the aggregated output (Urbano et al., 2018).

Entrepreneurs and entrepreneurship are subjects that might fall into the analysis of traditional streams in economics, namely micro- and macro-economics. In this regard, Parker (2004, 2018) has offered a thorough perspective regarding the so-called economics of entrepreneurship. Parker (2018, p. 2) perceives this as a research field and explains that "the economics of entrepreneurship literature continues to develop rapidly, generating numerous insights about how entrepreneurship interacts with the economy." As numerous other authors have argued (cf. Audretsch et al., 2015), entrepreneurship is marked by a lack of definition and all-embracing theory. Acs and Audretsch (1990) and Parker (2004, 2018) have sought to provide a rigorous theoretical model that understands economic factors regarding entrepreneurial and firm activity while highlighting how the economic perspective remains meaningful for entrepreneurship and SMEs. Other scholars have been encouraged by this call, and have provided further comment on this research field. For instance, Minniti and Lévesque (2008) and Audretsch et al. (2016) have organized different special journal issues gathering outstanding pieces of research, all aimed at comprehending economic antecedents and the consequences of entrepreneurship and small firms.

One may argue that Audretsch's research agenda is aligned with the perspective of the economics of entrepreneurship and small business, given that many of his contributions tackle questions pertaining to economic development, within which entrepreneurs and small firms are fundamental gears. In order to understand different aspects of the economics of entrepreneurship and small business, Parker (2005, pp. 5-6) has suggested different questions that frame how economists can contribute (or have contributed) to the field. These are as follows:

- [1.] How many jobs do entrepreneurs create?*
- [2.] Are small entrepreneurial firms more innovative than large corporations?*
- [3.] Do tax cuts stimulate entrepreneurship?*
- [4.] Why are blacks and females less likely to be entrepreneurs in Britain and America?*
- [5.] Do banks ration credit to new enterprises, and do capital constraints significantly impede entry into entrepreneurship?*

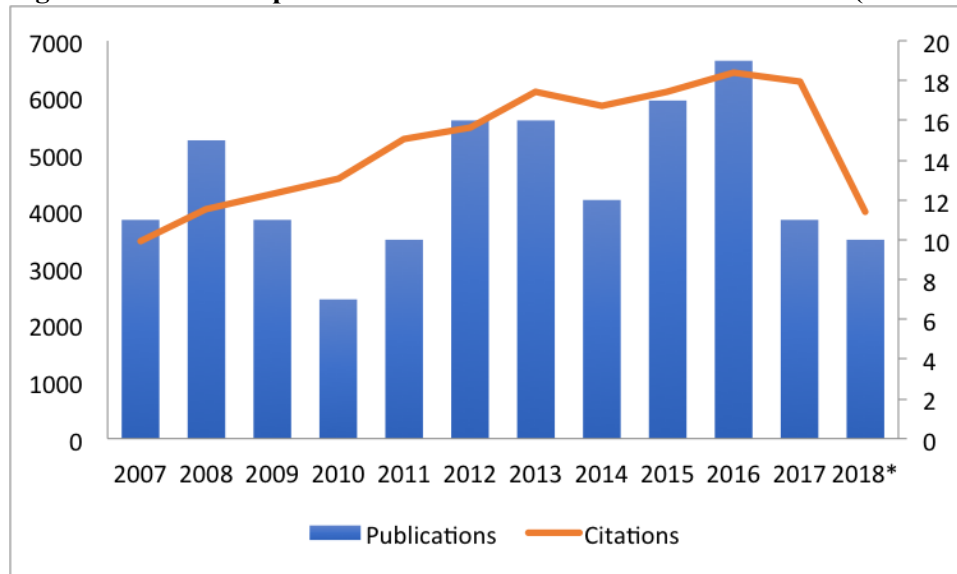
- [6.] *How successful are loan guarantee schemes in providing credit to new enterprises?*
- [7.] *Which entrepreneurial ventures are most likely to survive and grow?*
- [8.] *Why do entrepreneurs work so hard for such little pay?*
- [9.] *Does entrepreneurship cause economic growth?*
- [10.] *Should governments encourage or discourage entrepreneurship?"*

### 3. Main results

#### 3.1. Bibliometric findings

In one way or another, David Audretsch (alongside his co-authors) has provided insightful answers to the questions listed above. Part of his ability to offer impactful ideas is due to his readiness to share knowledge via different publications regarding small firms, entrepreneurship, innovation and economic development. Such contributions have been acknowledged highly by other academics, who continue to conduct research based on his ideas. For instance, Figure 1 shows that between 2007 and 2018 (until July), Audretsch produced 154 documents (articles, books, chapters, etc.), and received 61,915 citations on Google Scholar.

**Figure 1. Number of publications and citations of David Audretsch (2007-2018)**



\* Until July 2018.

In considering these widely cited works, it is possible to recognize that Audretsch initially approached entrepreneurship by exploring small firms' performance. Audretsch and Lehmann (2015) explained that an initial motivation came from reviewing statistics concerning large companies in both the United States of America (USA) and Germany. They realized that SMEs' performance was increasing whereas larger enterprises' productivity was declining. Innovation capacity constituted one of Audretsch and colleagues' hypotheses. Indeed, Audretsch suggested that SMEs are capable of introducing new processes and adapting to new environments, at least faster than their large counterparts. This idea was entirely aligned with Schumpeter's claims regarding innovation and entrepreneurship as a mechanism to turn new processes and ideas into new market products. Having undertaken SME and innovation analysis, the next topic explored by Audretsch comprised entrepreneurial activity and its backward (e.g., innovation capacity, knowledge, and geography) and forward links (e.g. productivity, economic growth, and competitiveness). This evolution of thought has been recognized by academics from around the world, who have cited Audretsch's publications. Table 1 displays the top 30 works, ranked according to citations on WoS and Google Scholar.

In terms of Audretsch's academic production, it is possible to observe the ways in which different concepts were embraced (or even developed). Figure 2 displays the keywords used in Audretsch's

publications. The x-axis is merely informative and enables us to identify the total number of keywords (119) across publications over the years (y-axis). Particularly striking is how the analysis of entrepreneurship and small firms has evolved into understanding the institutions that affect entrepreneurial activity, thus producing socio-economic outcomes (e.g., entrepreneurial society, entrepreneurial university, entrepreneurship capital, entrepreneurship policy, and entrepreneurial choice).

**Figure 2. The keywords used in David Audretsch's publications**

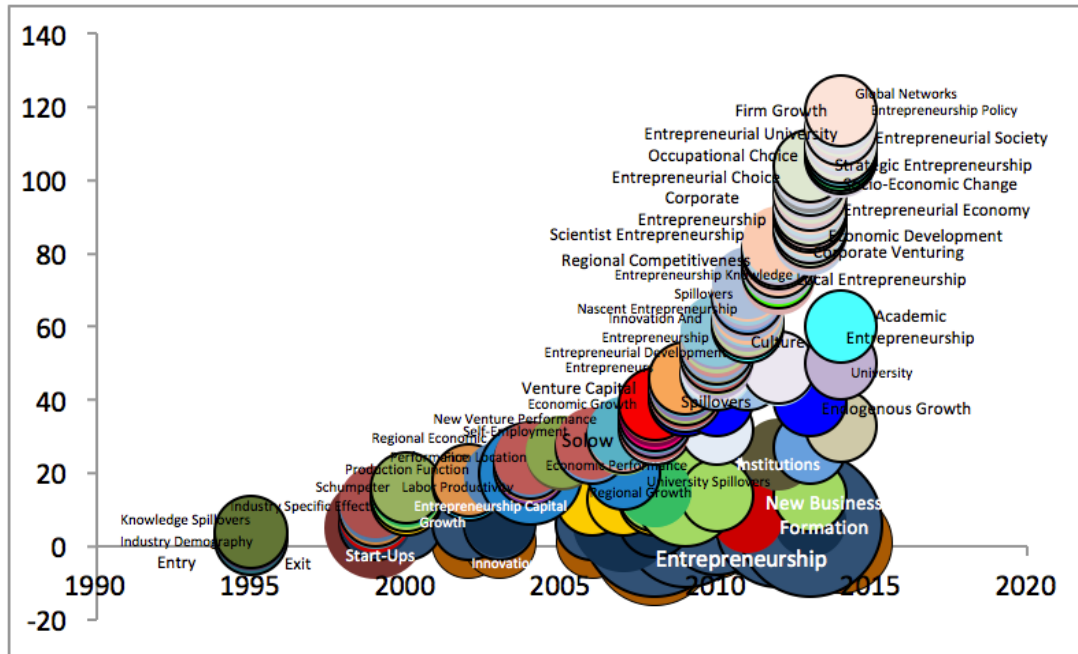


Figure 3 in turn displays the connections between keywords. In this case, we used co-occurrence networks through VOSviewer software. This technique enabled us to appreciate the ways in which keywords co-occur in at least two different publications written by David Audretsch and colleagues. Li et al. (2017) have explained that this method permits exploration of the most commonly used keywords in articles. Audretsch's orientation in analyzing entrepreneurship and small firms is thus evident. The central cluster (dark blue) connects entrepreneurship (capital) and innovation with traditional measures in economics (i.e., economic growth and economic development). These concepts are also connected with the upper cluster (green), regarding other variables related to public policy (i.e., university technology transfer, institutions, and performance). The cluster on the left-hand side (red) indicates those components that are close to innovation but that are additionally connected to entrepreneurial activity (such as R&D, market structure, academic research, productivity, among others). Finally, the cluster at the bottom (yellow) reveals some emerging topics that Audretsch leaves for further exploration (including the dynamics of entrepreneurship, time issues, and entry decisions). Overall, these connections facilitate appreciation of the varied concepts that surround entrepreneurial activity and SMEs in terms of both antecedents and consequences.

### 3.2. Findings from content analysis

The information presented so far permits an understanding of the landscape upon which Audretsch draws when analyzing entrepreneurship and small firms. However, the questions explored in Section 2 cannot be answered by only taking into consideration bibliometric information. Therefore, we used content analysis to identify works that in some way correspond to each of the questions proposed by Parker (2005). In total, we encountered 154 articles, books and book chapters in a time span from 2007 until July 2018. Although previous years were also devoted to exploring entrepreneurship, on the one hand analysis was more significantly focused

on innovation than on entrepreneurship, and on the other (and using Figure 2) from 2007 an explosion of concepts that fall into the intersection between entrepreneurship and economics occurred. In this regard, the analyzed articles offer some clues about how Audretsch has contributed to the development of economics of entrepreneurship and small firms.

#### *How many jobs do entrepreneurs create?*

In order to answer this question, we have identified five articles that facilitate understanding of how effective entrepreneurial activity contributes to reductions in unemployment. In particular, Thurik et al. (2008) have explored how self-employment (as a proxy of entrepreneurship) reduces unemployment. They found that in Organisation for Economic Co-operation and Development (OECD) countries where self-employment increased by 2.7% on average, unemployment fell by an average of 3.4%. Throughout this contribution, dynamic analysis was used to observe the ways in which entrepreneurship can bring long term-benefits. Similarly, Stuetzer et al. (2016) predicted a significant correlation between entrepreneurship and employment share, even when historical analysis is introduced. In this regard, we might state that entrepreneurs do create jobs, and therefore labor policies should consider entrepreneurship as a mechanism when defining regional and national objectives.

#### *Are small entrepreneurial firms more innovative than large corporations?*

Other sorts of policies that must be considered by regional and national governments are those related to the promotion of innovation within small firms. To answer this particular question, we have identified 25 publications that continue Audretsch's initial research agenda. Current studies compare the importance of SMEs for the economy, especially considering that they create a larger number of employees than their bigger counterparts (cf. Acs & Audretsch, 2013). Audretsch (2008) has explained that the evolution of the economic system is in fact supported by the creative destruction process (Schumpeter, 1911), in which incumbent firms as well as entrepreneurs must renovate and innovate to survive. This may imply the diffusion and absorption of knowledge – which is typically easier for SMEs than for big companies (Audretsch & Keilbach, 2008b) – appropriate corporate governance (Audretsch & Lehmann, 2011), and a national system of innovation (Acs et al., 2017a), where universities play an important role in providing bridging education programmes focused on innovation with market needs (Alshumaimri et al., 2010).

#### *Do tax cuts stimulate entrepreneurship?*

National systems of innovation and entrepreneurship require governments to align their purposes with the productive sector. This implies that certain barriers should be removed in order to generate a continuous flow of ideas, new businesses and products (Audretsch & Aldridge, 2009). Although we only identified one article related to this question (Chowdhury et al., 2015a), other areas within the economics of entrepreneurship and small firms can facilitate an understanding of how governments may become enemies of entrepreneurship. The first aspect explored by economists who analyze governmental distortion is related to fiscal policy. Indeed, the national treasury of each country is aware of its limited budget, and so businesses become an easy target for taxation. Chowdhury et al. (2015a) have demonstrated that these sorts of initiatives discourage entry decision. Another reason found in the literature deals with the correlation between taxes and corruption. Indeed, higher taxes may imply an inefficient use of public expenditure. In this regard, Aparicio et al. (2016) have demonstrated that entrepreneurial activity may increase if corruption is reduced.

**Table 1. Top 30 publications by David Audretsch**

WoS					Google Scholar					
Authors (year)	Title	Journal/ Editorial	Citations	Type	Authors (year)	Title	Journal/ Editorial	Citations	Type	
1 Audretsch and Feldman (1996)	R&D spillovers and the geography of innovation and production	AER	1785	A	1 Audretsch and Feldman (1996)	R&D spillovers and the geography of innovation and production	AER	6434	A	
2 Acs and Audretsch (1988)	Innovation in large and small firms: an empirical analysis	AER	764	A	2 Acs and Audretsch (1990)	Innovation and small firms	MIT	2885	B	
3 Feldman and Audretsch (1999)	Innovation in cities: Science-based diversity, specialization and localized competition	EER	612	A	3 Audretsch (1995)	Innovation and industry evolution	MIT	2690	B	
4 Audretsch and Stephan (1996)	Company-scientist locational links: The case of biotechnology	AER	493	A	4 Acs and Audretsch (1988)	Innovation in large and small firms: an empirical analysis	AER	2675	A	
5 Acs et al. (2009)	The knowledge spillover theory of entrepreneurship	SBE	384	A	5 Feldman and Audretsch (1999)	Innovation in cities: Science-based diversity, specialization and localized competition	EER	2381	A	
6 Audretsch (1998)	Agglomeration and the location of innovative activity	OREP	369	A	6 Audretsch (1998)	Agglomeration and the location of innovative activity	OREP	1599	A	
7 Acs et al. (1994)	R&D spillovers and recipient firm size	RES	347	A	7 Audretsch and Stephan (1996)	Company-scientist locational links: The case of biotechnology	AER	1524	A	
8 Acs and Audretsch (1987)	Innovation, market structure, and firm size	RES	339	A	8 Acs and Audretsch (1987)	Innovation, market structure, and firm size	RES	1444	A	
9 Audretsch and Mahmood (1995)	New firm survival: new results using a hazard function	RES	324	A	9 Audretsch et al. (2006)	Entrepreneurship and economic growth	Oxford	1351	B	
10 Audretsch and Keilbach (2004)	Entrepreneurship capital and economic performance	RS	298	A	10 Audretsch and Feldman (2004)	Knowledge spillovers and the geography of innovation	HRUE	1262	C	
11 Audretsch (1991)	New-firm survival and the technological regime	RES	288	A	11 Acs et al. (1994)	R&D spillovers and recipient firm size	RES	1207	A	
12 Acs et al. (1992)	Real effects of academic research: Comment	AER	282	A	12 Audretsch and Thurik (2001)	What's new about the new economy? Sources of growth in the managed and entrepreneurial economies	ICC	1190	A	
13 Audretsch (1995)	Innovation, growth and survival	IJIO	276	A	13 Audretsch and Mahmood (1995)	New firm survival: new results using a hazard function	RES	1139	A	

14	Audretsch and Feldman (1996)	Innovative clusters and the industry life cycle	RIO	259	A	14	Acs et al. (1992)	Real effects of academic research: Comment	AER	1117	A
15	Audretsch and Lehmann (2005)	Does the knowledge spillover theory of entrepreneurship hold for regions?	RP	235	A	15	Audretsch (1991)	New-firm survival and the technological regime	RES	1097	A
16	Gilbert et al. (2006)	New venture growth: A review and extension	JOM	215	A	16	Audretsch (1995)	Innovation, growth and survival	IJIO	991	A
17	Audretsch and Fritsch (2002)	Growth regimes over time and space	RS	203	A	17	Audretsch and Feldman (1996)	Innovative clusters and the industry life cycle	RIO	926	A
18	Audretsch and Thurik (2000)	Capitalism and democracy in the 21st century: from the managed to the entrepreneurial economy	JEE	193	A	18	Audretsch and Keilbach (2004)	Entrepreneurship capital and economic performance	RS	922	A
19	Acs and Audretsch (1989)	Patents as a measure of innovative activity	Kyklos	178	A	19	Audretsch and Thurik (2000)	Capitalism and democracy in the 21st century: from the managed to the entrepreneurial economy	JEE	758	A
20	Audretsch et al. (2005)	University spillovers and new firm location	RP	178	A	20	Verheul et al. (2002)	An eclectic theory of entrepreneurship: policies, institutions and culture	Ent	721	C
21	Audretsch and Fritsch (1994)	The geography of firm births in Germany	RS	176	A	21	Audretsch (2007)	The entrepreneurial society	Oxford	691	B
22	Thurik et al. (2008)	Does self-employment reduce unemployment?	JBV	157	C	22	Audretsch and Fritsch (2002)	Growth regimes over time and space	RS	661	A
23	Agarwal and Audretsch (2001)	Does entry size matter? The impact of the life cycle and technology on firm survival	JIE	157	A	23	Audretsch and Lehmann (2005)	Does the knowledge spillover theory of entrepreneurship hold for regions?	RP	621	A
24	Audretsch et al. (1999)	Start-up size and industrial dynamics: some evidence from Italian manufacturing	IJIO	144	A	24	Agarwal and Audretsch (2001)	Does entry size matter? The impact of the life cycle and technology on firm survival	JIE	620	A
25	Audretsch and Keilbach (2007a)	The theory of knowledge spillover entrepreneurship	JMS	134	A	25	Gilbert et al. (2006)	New venture growth: A review and extension	JOM	610	A
26	Braunerhjelm et al. (2010)	The missing link: knowledge diffusion and entrepreneurship in endogenous growth	SBE	129	A	26	Thurik et al. (2008)	Does self-employment reduce unemployment?	JBV	570	A
27	Agarwal et al. (2007)	The process of creative construction: Knowledge spillovers, entrepreneurship, and economic growth	SEJ	128	A	27	Acs and Audretsch (1989)	Patents as a measure of innovative activity	Kyklos	554	A
28	Gilbert et al. (2008)	Clusters, knowledge spillovers and new venture performance: An empirical examination	JBV	124	A	28	Audretsch and Fritsch (1994)	The geography of firm births in Germany	RS	542	A





*Why are minority groups less likely to be entrepreneurs in Britain and America?*

Governments not only affect entrepreneurial activity through fiscal issues, but also via policies that favor some communities more than others. We have found that seven publications involving Audretsch's collaboration have analyzed how cultural diversity and specific laws can explain differences in entrepreneurship among countries. For example, Audretsch et al. (2010) have explored the influence of some religions (supported by governments) on entrepreneurial activity and SMEs' performance. Cultural practices in which women are only valued for specific household activities demonstrate lower levels of entrepreneurship and quality (e.g., those that are necessity-driven). Welter et al. (2017) have suggested that policies should guarantee the equality of genders and communities, as well as other social aspects. Effectively, these authors argue that institutional and cultural differences exist not only at the macro level, but also at the individual level. In this sense, such differences should be identified so that the strategies implemented provide equal benefits for the entire community, regardless of the type of motivation.

*Do banks ration credit to new enterprises, and do capital constraints significantly impede entry into entrepreneurship?*

Some strategies that may create egalitarian results are focused on providing capital for those potential entrepreneurs that manifest intention, but for some reason cannot afford the current loan schemes. In order to answer this question, we found six articles that (although not precisely related to the subject) offer some clue regarding how long-term policies support a stable financial system. Audretsch and Aldridge (2012) have emphasized the importance of education in increasing salaries through gaining human capital. For those involved in academia, the experience obtained may enable them to apply for different loan mechanisms that leverage entrepreneurial initiatives. Audretsch et al. (2012a) have found that innovative nascent ventures demonstrate interest in accessing funding for their initiatives. In this regard, if the financial system creates barriers to access, small firms are unable to undertake new product or service development.

*How successful are loan guarantee schemes in providing credit to new enterprises?*

It is critical for entrepreneurship and SMEs to rely on the support of commercial banks, investors and public funds. This question leads us towards the understanding of entrepreneurial finance, which facilitates understanding of the strategic movement of entrepreneurs to attain and manage funding. We can note four articles that explain different means of obtaining funding and surviving in aggressive markets. For instance, Audretsch and Lehmann (2007, 2008) have demonstrated how mergers and acquisitions help the business system to grow, while providing funds for entrepreneurs involved in the inception of the project. In particular, Audretsch and Lehmann (2008) have demonstrated the important role of the financial system (with accessible loans) in the formation and survival of small businesses.

*Which entrepreneurial ventures are most likely to survive and grow?*

Public and private strategies can present opportunities to engage in entrepreneurship with growth aspirations, as entrepreneurs can undertake their work without worrying about financial pressures. Nonetheless, Audretsch (2012b) has explained that the adaptation process should also be considered. In this case, small and nascent firms tend to adapt more easily to either the process, product or service than large companies. This may imply that firms must have entrepreneurial spirit and motivation, as the market can change abruptly, causing chaos within the firm (Audretsch & Link, 2012a). These entrepreneurial firms are typically characterized by aspects that differentiate them from others. For example, they take greater risks such as by exploring international markets (Audretsch et al., 2018b) and connections with other companies (Gilbert et al., 2008). Overall, these firms work hard, aware that the payments they receive may appreciate after five years or more.

*Why do entrepreneurs work so hard for such little pay?*

Entrepreneurial characteristics, intentions and motivations are key components during the entrepreneurial process. Although the 24 works classified under this question do not compare workers' salaries with the benefits obtained by entrepreneurs, Audretsch has increased

understandings of why people remain interested in entrepreneurship as a career choice. One of the main reasons is based on the idea that entrepreneurs are constantly innovating. Audretsch (2015b), while synthesizing Shaker Zahra’s contribution to entrepreneurship research, has explained that entrepreneurial activity may be manifested through different ways (corporate entrepreneurship and international entrepreneurship), suggesting that everyone can be (and in fact is) an entrepreneur. Audretsch et al. (2015a) have shown how entrepreneurship, by definition, involves elements of organization, psychology and economics that support an understanding of intention, behavior and performance.

*Does entrepreneurship cause economic growth?*

Acs et al. (2012) have noted that if we as individuals are part of the entrepreneurial system in one way or another, then better results can be obtained for the economy as a whole. Akin to the first question regarding the importance of entrepreneurship for job creation, Audretsch has demonstrated that entrepreneurial activity matters for economic growth. For example, 33 works have explained the contributions of entrepreneurship to the economy. Audretsch and Keilbach (2008a) have developed the idea that innovative entrepreneurs, who are contained within the concept of entrepreneurship capital, may create superior results in terms of economic growth. Entrepreneurship capital (Audretsch & Keilbach, 2004), therefore, represents the endowment that each society has in terms of innovation, coordination and orientation towards entrepreneurship. Again, following the Schumpeterian (1911) notion, Audretsch and Lehmann (2017) have assumed that the key component in entrepreneurship is innovation. Combining these two elements, new ideas can be developed, with some information remaining in the market to be easily absorbed by other entrepreneurs. According to Braunerhjelm et al. (2010), knowledge flows through the economy, new entrepreneurs emerge, and greater economic growth is facilitated.

*Should governments encourage or discourage entrepreneurship?*

Part of the challenge of increasing economic performance is to create an environment in which people feel encouraged to engage in entrepreneurial activities that bring social and economic benefit (Audretsch & Keilbach, 2008a; Aparicio et al., 2016). As mentioned, the role of different agents is crucial in the development of an entrepreneurial society (Audretsch, 2007). Governments represent one such agent, providing mechanisms that help people to overcome different social circumstances, such as poverty and exclusion). In this regard, entrepreneurship is deemed a vehicle that helps individuals to be included into the labor market. According to Audretsch and Thurik (2007) and Audretsch and Lehmann (2016c), part of the success of countries such as Germany is due to the special attention they afford entrepreneurs and SMEs, viewing them as drivers of social and economic transformation. Thus, governments should consider consolidating an amenable financial system (Audretsch & Link, 2017a) and form clusters (Audretsch & Lehmann, 2016b) and infrastructure at the local level (Audretsch et al., 2015g). Table 2 summarizes the works analyzed from the economics of entrepreneurship and small business perspective.

**Table 2. Works that contribute to the field of economics of entrepreneurship and small business**

	<b>Question</b>	<b>Works</b>	<b>Total</b>
1	How many jobs do entrepreneurs create?	Audretsch et al. (2008c); Audretsch et al. (2015b); Stuetzer et al. (2016); Thurik et al. (2008); Welfens et al. (2012).	5

2	Are small entrepreneurial firms more innovative than large corporations?	Acs and Audretsch (2013); Acs et al. (2017a); Alshumaimri et al. (2010); Amoroso et al. (2018); Audretsch (2008); Audretsch (2018); Audretsch and Aldridge (2009); Audretsch and Keilbach (2008b); Audretsch and Lehmann (2011); Audretsch et al. (2008b); Audretsch et al. (2009a); Audretsch et al. (2011a); Audretsch et al. (2011c); Audretsch et al. (2014a); Audretsch et al. (2014c); Audretsch et al. (2014d); Audretsch and Caiazza (2016); Audretsch et al. (2016b); Audretsch et al. (2018c); De Massis et al. (2018); Demircioglu and Audretsch (2017); Gulbranson and Audretsch (2008); Huang et al. (2013); Tamvada and Audretsch (2008); Zhang et al. (2015).	25
3	Do tax cuts stimulate entrepreneurship?	Chowdhury et al. (2015a).	1
4	Why are minority groups less likely to be entrepreneurs in Britain and America?	Audretsch et al. (2010); Audretsch et al. (2016a); Audretsch et al. (2017a); Chowdhury and Audretsch (2014); Lyons et al. (2012); Obschonka et al. (2016); Welter et al. (2017).	7
5	Do banks ration credit to new enterprises, and do capital constraints significantly impede entry into entrepreneurship?	Audretsch and Aldridge (2012); Audretsch et al. (2011b); Audretsch et al. (2012a); Elston and Audretsch (2010); Guerzoni et al. (2014); Patzelt and Audretsch (2008).	6
6	How successful are loan guarantee schemes in providing credit to new enterprises?	Audretsch and Lehmann (2007); Audretsch and Lehmann (2008); Audretsch et al. (2016c); Elston and Audretsch (2011).	4
7	Which entrepreneurial ventures are most likely to survive and grow?	Audretsch (2012b); Audretsch and Dohse (2007); Audretsch and Link (2012a); Audretsch et al. (2009c); Audretsch et al. (2013b); Audretsch et al. (2014b). Firm growth and innovation; Audretsch et al. (2016b); Audretsch et al. (2017b); Audretsch et al. (2018b); Gilbert et al. (2008).	10
8	Why do entrepreneurs work so hard for such a little pay?	Acs and Audretsch (2009); Acs et al. (2010); Agarwal et al. (2010); Aldridge et al. (2014); Alshumaimri et al. (2012); Alvarez et al. (2016); Audretsch (2012a); Audretsch (2014c); Audretsch (2015b); Audretsch (2015d); Aldridge and Audretsch (2011); Audretsch and Lehmann (2016a); Audretsch et al. (2013a); Audretsch et al. (2015a); Audretsch et al. (2015d); Audretsch et al. (2016d); Caiazza and Audretsch (2013); Chowdhury et al. (2015b); Kuratko and Audretsch (2009); Kuratko and Audretsch (2013); Rocha et al. (2013); Stam et al. (2008); Welpe et al. (2012); Wiklund et al. (2011).	24
9	Does entrepreneurship cause economic growth?	Acs et al. (2012); Acs et al. (2013); Aparicio et al. (2016); Audretsch (2007b); Audretsch (2014a); Audretsch (2014b); Audretsch and Aldridge (2008); Audretsch and Aydogan (2009); Audretsch and Belitski (2013); Audretsch and Callejón Forniellas (2007); Audretsch and Keilbach (2007a); Audretsch and Keilbach (2007b); Audretsch and Keilbach (2008a); Audretsch and Peña-Legazkue (2012); Audretsch and Monsen (2008); Audretsch and Walshok (2013); Audretsch and Welfens (2013); Audretsch et al. (2008a); Audretsch et al. (2011b); Audretsch et al. (2012b); Audretsch et al. (2012c); Audretsch et al. (2013c); Audretsch et al. (2013d); Audretsch et al. (2015c); Audretsch et al. (2016f); Audretsch and Lehmann (2017); Braunerhjelm et al. (2010); Caiazza et al. (2015); Carlsson et al. (2009); Obschonka et al. (2015); Stuetzer et al. (2018); Urbano et al. (2018); Thurik et al. (2013).	33
10	Should governments encourage or discourage entrepreneurship?	Ács et al. (2009); Acs et al. (2016a); Acs et al. (2016b); Acs et al. (2017b); Aldridge and Audretsch (2010); Amable et al. (2008); Audretsch (2007a); Audretsch (2009b); Audretsch (2013a); Audretsch (2013b); Audretsch (2015a); Audretsch (2015c); Audretsch (2017); Audretsch and Beckmann (2007); Audretsch and Lehmann (2014); Audretsch and Lehmann (2016b); Audretsch and Link (2012b); Audretsch and Thurik (2007); Audretsch et al. (2007); Audretsch et al. (2009b); Audretsch et al. (2011b); Audretsch et al. (2012d); Audretsch et al. (2012e); Audretsch et al. (2015e); Audretsch et al. (2015f); Audretsch et al. (2015g); Audretsch and Lehmann (2016c); Audretsch et al. (2016a); Audretsch et al. (2016e); Audretsch and Belitski (2017); Audretsch and Link (2016); Audretsch and Link (2017a); Audretsch and Link (2017b); Audretsch et al. (2018a); Bischoff et al. (2018); Caiazza and Audretsch (2015); Caiazza et al. (2014); Chowdhury et al. (2018); Tanas and Audretsch (2011).	39

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#### 4. Conclusions and discussion regarding future research avenues

In this chapter, we quantitatively and analytically examined Audretsch's contributions to the economics of entrepreneurship and small business, from 2007 until the present day (July 2018). Based on searches using Google Scholar and Web of Science (WoS), we relied upon bibliometrics and content analyses to explore production indexes (number of publications, top articles, citations, keywords and networks) and to show the evolution of the research field.

We have noted that Audretsch is a remarkable scholar, publishing an average of 13 articles, books or chapters per year. Such productivity has been recognized by researchers from all over the world, with Audretsch receiving an average of 5,960 citations each year. In reviewing his seminal works, it is possible to identify an evolution in his research agenda, beginning with the examination of innovation in SMEs relative to large companies, and later exploring industrial structure in terms of its actors, such as incumbent firms, governments and entrepreneurs. Thus, entrepreneurship, innovation and SMEs have become key units of analysis, which can be seen as leveraging economic growth. Such findings are corroborated by analysis of keywords and co-occurrence.

David Audretsch has been a key scholar in advancing understandings of entrepreneurship from an economics perspective. By revising the content of 154 articles on Google Scholar, published between 2007 and July 2018, we found that different questions regarding the economics of entrepreneurship and small business (cf. Parker, 2005) were completely answered. Audretsch's contributions present general overviews and specific evidence that demonstrate the pertinence of entrepreneurship within the economics of science.

Although we would have liked to embrace all of Audretsch's publications, we are confident that our time period is pertinent to understanding advances in entrepreneurship research. Nevertheless, we believe that future research avenues may create further insights not only regarding entrepreneurial activity as a field of inquiry, but also in terms of the identification and conceptualization of other subfields within the economics of entrepreneurship and small business. These may stimulate further analysis concerning the complexity behind economic development, in which institutions guide entrepreneurs to produce social solutions and outcomes (Audretsch & Keilbach, 2008a; Braunerhjelm et al., 2010; Urbano et al., 2018). Here, institutional economics could be applied to the analysis of diversity in entrepreneurship and small firms, as these elements also contribute to the development of markets, places, industries and so forth (Urbano et al., 2018; Welter et al., 2017). In addition, further analysis of Audretsch's publications may help connect social and economic policies aimed at the promotion of an entrepreneurial society, characterized by different types of entrepreneurs, from different communities and contexts.

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