



## Innovation management in small and medium enterprises: A bibliometric analysis approach between 1985 and 2019

### *Gestión de la innovación en la pequeña y mediana empresa: un enfoque de análisis bibliométrico entre 1985 y 2019*

Denisse Liliana Ballardo Cárdenas<sup>a</sup>, Ramón Martínez Huerta<sup>b</sup>, Ernesto León Castro<sup>\*</sup>, Kenia Caroly Sánchez Valenzuela<sup>c</sup>

<sup>a</sup> Universidad Autónoma de Occidente (UAdeO). Blvd. Lola Beltrán and Blvd. Rolando Arjona, 4 de marzo, Z.C. 80020 Culiacán Rosales, Sinaloa, México – denisse.ballardo@uadeo.mx – <https://orcid.org/0000-0002-2363-7376>

<sup>b</sup> Universidad Autónoma de Occidente (UAdeO). Blvd. Lola Beltrán and Blvd. Rolando Arjona, 4 de marzo, Z.C. 80020 Culiacán Rosales, Sinaloa, México – ramon.martinez@uadeo.mx – <https://orcid.org/0000-0001-7934-4217>

<sup>c</sup> Universidad Autónoma de Occidente (UAdeO). Blvd. Lola Beltrán and Blvd. Rolando Arjona, 4 de marzo, Z.C. 80020 Culiacán Rosales, Sinaloa, México – kenia.sanchez@uadeo.mx – <https://orcid.org/0000-0001-9605-625X>

<sup>\*</sup> **Corresponding author:** Universidad Católica de la Santísima Concepción. Av. Alonso de Ribera 2850, Concepción, Bío Bío, Chile – [eleon@ucsc.cl](mailto:eleon@ucsc.cl) – <https://orcid.org/0000-0002-0087-2226>

#### ARTICLE INFO

Received 29 June 2021,  
Accepted 23 December 2021

Available online 4 March 2022

DOI: 10.5295/cdg.211551el

JEL: A14, O30

#### ABSTRACT

Many changes have come over the business with the onset of globalization and the digitization of the economy, including the last two years. In addition, relevant changes have been caused by the COVID-19 pandemic, demonstrating the relevance of innovation management (IM) within organizations as a process to face these new realities. This article aims to present the main contributions on innovation management in small- and medium-sized enterprises (IM in SMEs). To determine the state-of-the-art innovation techniques, the study systematically reviews articles related to this subject using a bibliometric study approach between 1985 and 2019 using the Web of Science (WoS) database. The study analyzes and presents the most cited articles, the main authors, institutions, countries, and the most productive journals. Additionally, VOSviewer was used to provide a more in-depth analysis of the data obtained from the search. Among the main results, it is clear that the most productive universities and the most influential and productive authors are in the United States, leaving a relevant possibility of taking this analysis to different countries, mainly developing countries, to adjust adequate innovation processes according to the specific realities of each country.

**Keywords:** Innovation Management; Small and Medium Businesses; Bibliometric Analysis; VOSviewer.

#### RESUMEN

Muchos cambios empresariales se han generado con la globalización y la digitalización de la economía, incluyendo estos últimos 2 años se han generado cambios relevantes derivados de la pandemia Covid 19, demostrando la relevancia de la gestión de la innovación dentro de las organizaciones, como proceso para afrontar estas nuevas realidades. Este artículo tiene como objetivo presentar las principales aportaciones sobre el tema de la gestión de la innovación en la pequeña y mediana empresa (IM in SME). Para conocer el estado del arte del tema, el estudio revisa sistemáticamente artículos relacionados con este tema a través de un enfoque de estudio bibliométrico entre 1985 y 2019 utilizando bases de datos de Web of Science (WoS). El estudio analiza y presenta los artículos más citados, los principales autores, instituciones, países y las revistas más productivas. Además, se utilizó el software VOSviewer para proporcionar un análisis más profundo de los datos obtenidos de la búsqueda. Entre los principales resultados, está claro que las universidades más productivas, los autores más influyentes y productivos se encuentran en Estados Unidos dejando una posibilidad muy relevante de llevar este análisis a diferentes países, principalmente países en vías de desarrollo, para ajustar procesos de innovación adecuados de acuerdo con las realidades específicas de cada país.

**Palabras clave:** Gestión de Innovación; Pequeñas y Medianas Empresas; Análisis Bibliométrico; VOSviewer.

## 1. INTRODUCTION

The business world states that the dynamic nature of most markets seems to explain why it is almost impossible to find an industry that is not involved in innovation (Hurley & Hult, 1998). In this way, innovation stands out as one of the most effective ways of conducting business because it has been an important engine of growth and competitiveness for companies (OECD, 2005). Therefore, companies need to innovate, and it is possible through only a complex interaction of human, organizational, technological, and market elements. Innovation management (IM) seeks to understand and find better ways to manage these interactions for successful innovations.

IM seeks to understand and find better ways to manage these interactions for successful innovations. The literature on IM has constantly evolved (Keupp *et al.*, 2012). In the study of IM, there is an interest focused on small- and medium-sized companies (SMEs) (Alfaro-García *et al.*, 2017; Aragón-Sánchez & Sánchez-Marín, 2005). SMEs introduce notable innovations (Keizer *et al.*, 2001) that strengthen the position of the industry and generate profits above the market average (Porter, 1998) and are an important part of all countries' economies regarding their impact on economic growth, poverty reduction and job creation. However, SMEs are not only an important source of employment; they can also become a source of innovation and increased productivity (Herr & Nettekoven, 2018). As a result, SMEs have become increasingly important players in the international business arena (Torres-Ortega *et al.*, 2015). Notwithstanding, studies focused on SMEs are scarce and inconclusive (Solano Acosta *et al.*, 2018).

The bibliometric study is considered the quantitative study of bibliographic material that can show a general image of a field of research (Merigó & Yang, 2017). Additionally, it is a timely approach to examine the evolution of research domains, including topics and authors, based on disciplines' social, intellectual, and conceptual structures (Donthu *et al.*, 2020).

For example, bibliometric analyses of specific journals (Byington *et al.*, 2019; Merigó *et al.*, 2018) and research areas such as e-health informatics (Kokol *et al.*, 2018), corporate social responsibility (Bhattacharyya & Verma, 2020), and fuzzy decision-making (Blanco-Mesa *et al.*, 2017; Merigó *et al.*, 2015) have been performed. Hence, this paper aims to provide useful information on scientific research publications about IM in SMEs from 1985 to 2019 through a bibliometric analysis.

Using VOSviewer software, the study uses a bibliometric approach to map authors, institutions, countries, and journals (van Eck & Waltman, 2010). Among other results, this paper shows a growing field of study and that a considerable number of articles and citations are concentrated in different magazines. This paper continues as follows: Section 2 describes the research method by describing the bibliometric study, Section 3 presents the results of our bibliometric study, and Section 4 develops a graphical visualization of the results using VOSviewer software. Finally, Section 5 presents the main conclusions of the paper.

## 2. THEORETICAL FRAMEWORK

The concept of IM originates in Bruns and Stalker (1961) with an essentially sociological starting point, although it is related to industrial organization and business management.

IM includes research and development (R&D) management and aspects such as the launch of new products and the study of the reasons for their success or failure (Escorsa & Valls Pasola, 1997).

Addressing SMEs, IM studies are traditionally disconnected from technological innovation works. Therefore, some authors explore whether technological innovators benefit from introducing IM (Hervas-Oliver *et al.*, 2015) and to what extent complementarities exist between IM and technological innovation (Volberda *et al.*, 2013).

Furthermore, the managers of most companies know that carrying out innovative activities contributes to improving the competitiveness of their organizations and, consequently, to obtain higher incomes (Igartua & Errasti, 2007). Similarly, companies become aware of the importance of innovation in their futures and the need to manage innovation to become highly competitive. Finally, they understand that innovation is key to the organization's survival, as it is in public organizations that need to improve their services (Eveleens, 2010) or organizations that need to compete for market share or profits.

Therefore, IM in SMEs is an important instrument for the transformation of companies when the entire organization is ready to update and reform (Bilton & Cummings, 2010) and can play a central role in the process of organizational change, facilitating organizational adaptation to the external environment and increasing the efficiency and effectiveness of internal processes (Walker *et al.*, 2011).

## 3. RESEARCH METHODOLOGY

Currently, measuring the quality and quantity of scientific production is a necessity since almost every research assessment decision depends upon the scientific merits of the involved researchers (Gutiérrez-Salcedo *et al.*, 2018). To do that, we introduce two main bibliometric procedures to analyze the impact of a research field and its scientific structures.

Particularly, this analysis is performed with the bibliographic search in which the Web of Science collection database is used (WoS). This database was previously used in academic research as the main source (Cancino *et al.*, 2018; Rey-Martí *et al.*, 2016; Rialti *et al.*, 2019; van Nunen *et al.*, 2018). In this sense, to search for articles that have focused on IM in SMEs, the research includes the following steps:

Step 1. The study uses "innovation management" and SME or "small and medium enterprise\*?". This selection of keywords helps determine the study sample and considers the objective and criteria equivalent to innovation management in small and medium enterprises. The analysis considered any work available in WoS between 1985 and 2019 to capture as many possible combinations of terms related to IM in SMEs. This search finds 3,117 articles, which have become 3,055 studies by considering only articles, reviews, and letters. The analysis considered any work available in WoS between 1985 and 2019 to capture as many possible combinations of terms relate to IM in SMEs. This search finds 3117 academic papers, that have become 3055 academic papers by only considering articles, reviews, and letters available in WoS.

Step 2. Additionally, the search was defined by management, business, economics, industrial engineering, and operation re-

search management science. After applying this filter, a sample of 1,772 were the total number of documents obtained. Until 2019, IM in SME had received 25,260 citations from other documents available in the WoS database. This results in an average number of citations per article of 15.04, and the h index was 72. Of the 1,772 documents, 72 have received 72 citations or more, in addition to articles in which they are cited. The search began on June 6, 2021.

Step 3. Moreover, this study included bibliometric indicator citations by year, citations by paper, thresholds by appointment, and the articles they cited. Another indicator is the h-index (Hirsch, 2005) proposed and defined by the physicist Hirsch to measure a researcher’s productivity to take into account his publications and citations obtained. The h-index combines articles with citations indicating “x” number of studies that have received “y” or more citations. In addition, this study considers a ranking of universities in the Academic Ranking of World Universities (ARWU) and the Quacquarelli Symonds University Ranking (QS). These bibliometric indicators allow the display of the information and facilitate the understanding of the topic.

Step 4. Finally, the study graphically maps the bibliographic material using VOSviewer. The VOSviewer has been used in several studies (Caputo et al., 2018; Martínez-López et al., 2020; Sarkodie & Strezov, 2019; Shah et al., 2020) to collect data employed to conduct co-citation, bibliographic coupling, and co-occurrence of author keywords in a descriptive analysis.

4. RESULTS

This section presents the results of this bibliometric contribution to IM in SMEs from 1985 to 2019 in the WoS database. It provides tables and figures, classified by the most cited papers, leading journals, and the most productive authors, institutions, and countries.

4.1. General perspective

According to the results obtained, the subject of the IM in SMEs has been studied over the years. As a result, it shows a growing evolution, from 1 article in 1985 to 254 in 2019. In addition, many of the publications are concentrated in the last five years; this evolution is observed through the information provided in Figure 1.

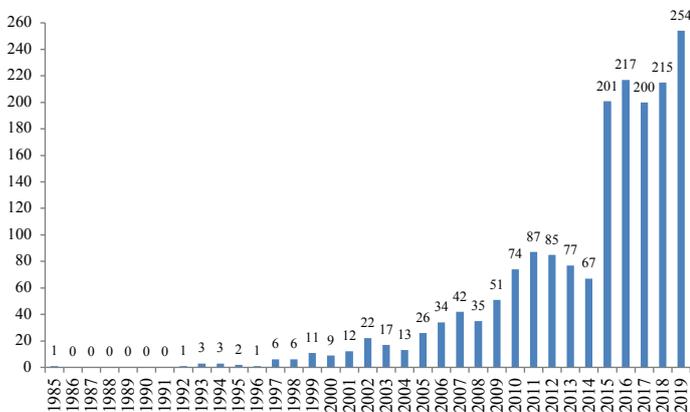


Figure 1

The annual number of papers published in IM in SME

Source: Own elaboration.

Table 1  
Annual citation structure of IM in SME

Year	TP	TC	Thresholds						
			>200	>100	>50	>20	>10	>5	>1
1982	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0
1985	1	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0
1992	1	15	0	0	0	0	1	0	0
1993	3	57	0	0	0	1	0	1	1
1994	3	64	0	0	1	0	0	0	0
1995	2	23	0	0	0	1	0	0	1
1996	1	4	0	0	0	0	0	0	1
1997	6	65	0	0	0	1	2	2	1
1998	6	122	0	0	1	1	1	2	0
1999	11	758	1	3	1	1	2	1	2
2000	9	375	0	0	5	1	0	1	1
2001	12	596	1	1	1	4	0	2	2
2002	22	1 011	1	1	3	9	5	1	2
2003	17	593	0	2	2	5	3	2	2
2004	13	716	1	1	3	3	2	0	2
2005	26	1 913	2	3	4	8	3	2	4
2006	34	1 748	1	3	11	8	5	3	1
2007	42	1 525	2	1	3	7	8	5	7
2008	35	739	0	0	6	6	6	4	7
2009	51	2 101	2	5	7	10	4	6	9
2010	74	1 879	1	2	9	16	10	13	13
2011	87	1 629	0	2	7	15	9	12	33
2012	85	1 688	0	4	7	13	21	7	14
2013	77	1 110	0	1	3	15	17	13	18
2014	67	913	0	0	3	11	19	10	13
2015	201	1 920	0	0	3	28	33	40	61
2016	217	1 561	0	0	2	16	39	46	63
2017	200	1 123	0	0	2	12	20	37	84
2018	215	645	0	0	0	3	12	27	111
2019	254	367	0	0	0	1	5	17	95
Total	1 772	25 260	12	29	84	196	227	254	548
	100%		0.67	1.63	4.7	11.06	12.81	14.33	30.92

Note: Abbreviations: TP and TC = Total papers and citations; the thresholds ≥200, ≥100, ≥50, ≥20, ≥10, ≥5, ≥1 = number of papers with equal or more than 200, 100, 50, 20, 10, 5 and 1 citations respectively.

Source: Own elaboration.

Table 1 presents the growth in the number of citations over time. Of particular note, the study is increasing with a total of 1,772 productions and 25,260 citations. For example, the topic of IM in SMEs was studied mainly in 2016 and 2019 according to the number of publications. Still, the largest number of citations was from 2009, with 2,101 and 55 publications.

Table 2  
The 30 most cited papers in IM in SME between 1985 and 2019

R	TC	Title	Author/s	Y	C/Y
1	499	Internationalization and the performance of born-global SMEs: the mediating role of social networks	Zhou <i>et al.</i>	(2007)	42
2	486	Entrepreneurship, innovation and economic growth: Evidence from GEM data	Wong <i>et al.</i>	(2005)	35
3	413	Critical success factors for implementing knowledge management in small and medium enterprises	Yew Wong	(2005)	30
4	355	The competitiveness of small and medium enterprises - A conceptualization with focus on entrepreneurial competencies	Man <i>et al.</i>	(2002)	21
5	280	Small and medium enterprises across the globe	Ayyagari <i>et al.</i>	(2007)	23
6	279	Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: a resource-based view	Terziovski	(2010)	31
7	235	SMEs and CSR theory: Evidence and implications from an Italian perspective	Perrini	(2006)	18
8	215	Bank competition and access to finance: International evidence	Beck <i>et al.</i>	(2004)	14
9	214	The export orientation and export performance of high-technology SMEs in emerging markets: The effects of knowledge transfer by returnee entrepreneurs	Filatotchev <i>et al.</i>	(2009)	21
10	208	Selecting management systems for sustainable development in SMEs: A novel hybrid model based on DEMATEL, ANP, and ZOGP	Tsai & Chai.	(2009)	21
11	204	Manufacturing strategy - Literature review and some issues	Dangayach & Deshmukh	(2001)	11
12	201	Small firms, social capital and the enhancement of business performance through innovation programmes	Cooke & Wills	(1999)	10
13	192	Convergence Versus Divergence of CSR in Developing Countries: An Embedded Multi-Layered Institutional Lens	Jamali & Neville	(2011)	24
14	192	Innovation and internationalization through exports	Cassiman <i>et al.</i>	(2011)	24
15	189	Intellectual capital and new product development performance: The mediating role of organizational learning capability	Hsu & Fang	(2009)	19
16	185	Knowledge codification and the geography of innovation: the case of Brescia mechanical cluster	Lissoni, F	(2001)	10
17	182	SMEs, growth, and poverty: Cross-country evidence	Beck <i>et al.</i>	(2005)	13
18	172	The antecedents of SME innovativeness in an emerging transition economy	Radas & Bozic	(2009)	17
19	167	The competitive advantage of early and rapidly internationalizing SMEs in the biotechnology industry: A knowledge-based view	Gassmann & Keupp.	(2007)	14
20	165	Factors impacting the adoption of the Internet among SMEs	Dholakia <i>et al.</i>	(2004)	11
21	157	The Role of Networks in Small and Medium-Sized Enterprise Innovation and Firm Performance	Gronum <i>et al.</i>	(2012)	22
22	156	Peculiar Strengths and Relational Attributes of SMEs in the Context of CSR	Jamali <i>et al.</i>	(2009)	16
23	155	Managing 'green' product innovation in small firms	Noci <i>et al.</i>	(1999)	8
24	153	Strategic orientation, management characteristics, and performance: A study of Spanish SMEs	Aragon-Sanchez <i>et al.</i>	(2005)	11
25	151	Information internalization and hurdle rates in small and medium enterprise internationalization	Liesch & Knight	(1999)	8
26	145	International business competence and the contemporary firm	Knight & Kim	(2009)	15
27	138	Innovation systems and 'inertia' in R&D location: Norwegian firms and the role of systemic lock-in	Narula	(2002)	8
28	135	Bank involvement with SMEs: Beyond relationship lending	De la Torre <i>et al.</i>	(2010)	15
29	133	Capabilities, Proactive CSR and Financial Performance in SMEs: Empirical Evidence from an Australian Manufacturing Industry Sector	Torugsa <i>et al.</i>	(2012)	19
30	129	Firm survival through a crisis The influence of market orientation, marketing innovation and business strategy	Naidoo	(2010)	14

Note: Abbreviations: R = Rank; TC = Total citations; C/Y = Citations per year.

Source: Own elaboration.

Table 2 presents the thirty most cited papers of the journal at all times. Keep in mind that for this study, 1985 to 2019 is considered to be a period. Therefore, in this table, the five most cited papers were published in 2002, 2005 and 2007.

Internationalization and the performance of born-global SMEs: The mediating role of social networks is the most cited article with 499 citations, written by Zhou *et al.* (2007), and is ranked first. This article studies the purported relationship between internationalization and firm performance in the context of born global small and medium enterprises (SMEs) and argues that home-based social networks play a mediating role in the relationship between inward and outward internationalization and firm performance. This paper shows a social network explanation for the purported relationship between internationalization and firm performance in the context of born-global small and medium enterprises (SMEs). Home-based social networks play a mediating role in the relationship between inward and outward internationalization in the firm performance. They used survey data from SMEs in the largest emerging economy of China, they found some support for this mediating role of social networks in the form of guanxi. The results show that international business managers should consider social networks as an efficient means of helping internationally oriented SMEs to go international more rapidly and profitably (Zhou *et al.*, 2007).

Following is the article Entrepreneurship, innovation, and economic growth: Evidence from GEM data with 486 citations and written by Wong *et al.* (2005). This paper focuses on exploring the impact of entrepreneurship in conjunction with innovation on macro-level economic growth.

Ranked third is the article Critical success factors for implementing knowledge management in small and medium enterprises with 413 citations and is written by Yew Wong (2005). In this article, the author compares, and reviews critical success factors proposed by various authors in the literature for implementing knowledge management in small and medium enterprises (SMEs).

Ranked fourth is the article The competitiveness of small and medium enterprises - A conceptualization focusing on entrepreneurial competencies with a total of 355 citations and written by Man *et al.* (2002). In this article, the authors develop a conceptual model to link the characteristics of SMEs' owner-managers and their firms' performance.

Finally, the article Small and medium enterprises across the globe are ranked fifth with a total of 280 citations and are written by Ayyagari *et al.* (2007). This article analyzes the relationship between the relative size of the SME sector and the business environment in 76 countries.

The paper describes a new and unique cross-country database that presents consistent and comparable information on the contribution of the SME sector to total employment in manufacturing and GDP across different countries and relates the importance of SMEs and the informal economy to indicators of different dimensions of the business environment.

#### 4.2. Leading authors, institutions and countries

This section will analyse the authors, institutions, and countries that have the most publications about IM in SMEs. First,

the most influential authors in the development of this research field will be analyzed. Note that in the case of a tie, the ranking is according to the number of citations.

Table 3 highlights the most important researchers in IM in SMEs and lists thirty authors. Sohn SY is the most productive leader in this classification, with 12 articles, 233 citations and an h-index of 9, followed by Ahmad NH with 11 articles, 21 citations and an h-index of 3. Gunasekaran ranks third, with a total of 9 publications and a considerable number of 268 citations. Gunasekaran stands out for the author with the highest h-index of 57 among the 30 most productive authors.

Finally, Demirguc-Kunt stands out for being the author with the most citations, with a total of 754 citations and five publications. Although this author's level of productivity is not similar to that of leaders, his influence is evident from the total number of citations received.

Next, in Table 4, we analyze the most productive institutions to determine which universities produce the most documents and identify the universities that publish the most science in IM in SMEs.

The World Bank located in the United States is the most productive institution, with 18 papers and 1,288 citations, the highest number in this top 30. The Indian Institute of Technology System IIT System located in India ranked second, with 18 papers but fewer citations (390).

Likewise, in this top 30, the countries with the largest institutions are Malaysia, Spain, Italy, and the United States.

Another aspect to consider is that universities are highlighted by their h-index. For example, the State University System of Florida, located in the USA, has an h-index of 13 and 412 citations by paper.

Countries make considerable efforts to promote scientific development. This development places them at the forefront and enables them to attain a leading position in the research field. Table 5 highlights the most important countries that have contributed to the development of the IM in SMEs. The USA is the most influential country on the topic, the most productive with 169 papers, the most cited country with 5,369 total citations, and highlights with the h-index 38. England is ranked second, with 12 papers of difference and 3,701 citations and an h-index of 36. Italy, which has 142 publications and 2,820 of the total citations of the total productivity, ranks third; its h-index is 30. India is another country with important productivity, with 132 publications, an h-index of 17, and 1,215 citations. From this perspective, Spain and China obtain remarkable results, ranking fifth and sixth, respectively.

Table 3  
**Top 30 most productive and influential authors in IM in SMEs**

R	Author	University	Country	TP	TC	H	C/P	Thresholds		
								≥200	≥100	≥50
1	Sohn SY	Yonsei University	South Korea	12	233	9	25.89	0	0	1
2	Ahmad NHs	Universiti Sains Malaysia	Malaysia	11	21	3	7	0	0	0
3	Gunasekaran	California State University Bakersfield	USA	9	268	57	4.70	0	0	3
4	Ramayah T	Universiti Sains Malaysia	Malaysia	9	16	26	0.62	0	0	0
5	Halim Ha	Universiti Sains Malaysia	Malaysia	8	7	7	1	0	0	0
6	Garengo P	University of Padua	Italy	7	191	15	12.73	0	0	1
7	Depablos Po	University of Oviedo	Spain	7	14	21	0.67	0	0	0
8	Belas J	Tomas Bata University Zlin	Czech Republic	6	120	15	8	0	0	0
9	Lee H	Tokyo University of Technology	Japan	6	147	1	147	0	0	1
10	Esposito E	University of Naples Federico II	Italy	6	122	18	6.78	0	0	0
11	Paoluccie E	Polytechnic University of Turin	Italy	6	70	8	8.75	0	0	1
12	Rahman Sa	National University of Sciences & Technology	Pakistan	6	11	8	1.38	0	0	0
13	Demirguc-Kunt A	The World Bank	USA	5	754	49	15.39	2	1	1
14	Cerchioner R	Parthenope University Naples	Italy	5	117	14	8.36	0	0	0
15	Kumar V	Roever Coll Engn & Technol	India	5	51	1	51	0	0	0
16	Neirotti P	Polytechnic University of Turin	Italy	5	30	12	2.50	0	0	0
17	Rahman A	Tomas Bata University Zlin	Czech Republic	5	43	4	10.75	0	0	0
18	Rasiah R	Universiti Malaya	Malaysia	5	27	17	1.59	0	0	0
19	Lesakoval L	Matej Bel University	Slovakia	5	18	5	3.60	0	0	0
20	Kharub M	CVR Coll Engn	India	5	17	13	1.31	0	0	0
21	Beck T	University of London	England	4	704	41	17.17	2	1	0
22	Dangayach GS	Malaviya National Institute of Technology Jaipur	India	4	246	14	17.57	1	0	0
23	Gupta H	Shri Mata Vaishno Devi University	India	4	104	2	52	0	0	1
24	Barua Mk	Indian Institute of Technology	India	4	96	14	6.86	0	0	1
25	Centobelli P	University of Naples Federico II	Italy	4	85	11	7.73	0	0	0
26	Cegarra-Navarro JG	Universidad Politecnica of Cartagena	Spain	4	71	20	3.55	0	0	0
27	Afrifa Ga	University of Kent	England	4	32	5	6.40	0	0	0
28	Fan L	Wuhan University of Technology	China	4	23	4	5.75	0	0	0
29	Bi Gb	University of Science & Technology of China	China	4	11	3	3.67	0	0	0
30	Aliz Z	University of Science & Technology of China	China	4	10	2	5	0	0	0

Note: Abbreviations available in Tables 1 and 3 except: C/P = Cites per paper; H = h -index.

Source: Own elaboration.

Table 4  
**Top 30 most productive and influential institutions in the IM in SMEs**

R	Institution	Country	TP	TC	C/P	H	Thresholds			ARWU	QS
							≥200	≥100	≥50		
1	The World Bank	USA	18	1 288	71.56	12	2	3	3		
2	Indian Institute of Technology System IIT System	India	18	390	21.67	7	1	0	1	501-600	172
3	Universiti Sains Malaysia	Malaysia	17	76	4.47	6	0	0	0	501-600	207
4	Universiti Malaya	Malaysia	16	164	10.25	7	0	0	1	301-400	87
5	University of Padua	Italy	14	311	22.21	8	0	0	2	201-300	249
6	Polytechnic University of Milan	Italy	13	419	32.23	9	0	1	1	201-300	156
7	Yonsei University	South Korea	13	254	19.54	9	0	0	1	201-300	107
8	Polytechnic University of Turin	Italy	13	126	9.69	6	0	0	1	501-600	571-580
9	University of Valencia	Spain	12	154	12.83	5	0	0	1	201-300	561-570
10	Bucharest University of Economic Studies	Romania	12	79	6.58	5	0	0	0	901-1 000	801-1 000
11	Universiti Teknologi Malaysia	Malaysia	11	572	52	6	1	0	1	501-600	228
12	University of Zagreb	Croatia	11	256	23.27	5	0	1	0	401-500	801-1 000
13	University System of Georgia	USA	11	136	12.36	5	0	0	1	501-600	431
14	Universidad Politecnica of Cartagena	Spain	11	90	8.18	5	0	0	0		
15	State University System of Florida	USA	10	412	41.20	13	0	2	1	201-300	472
16	University of Murcia	Spain	10	370	37	6	0	2	1	701-800	801-1 000
17	Tomas Bata University Zlin	Czech Republic	10	159	15.90	7	0	0	0		
18	University of Nottingham	United Kingdom	9	328	36.44	6	1	0	1	101-150	82
19	Massey University	New Zealand	9	204	22.67	6	0	0	1	601-700	332
20	Universidade do Minho	Portugal	9	162	18	5	0	0	0	401-500	651-700
21	Brunel University	United Kingdom	9	94	10.44	6	0	0	0	501-600	332
22	University of Ljubljana	Slovenia	9	89	9.89	6	0	0	0	501-600	651.7
23	Complutense University of Madrid	Spain	9	74	8.22	5	0	0	0	201-300	206
24	University of Zulia	Venezuela	9	3	0.33	1	0	0	0		
25	Bocconi University	Italy	8	495	61.88	4	1	1	1		
26	Deakin University	Australia	8	191	23.88	5	0	1	0	201-300	309
27	Multimedia University	Malaysia	8	173	21.63	4	0	1	0		801-1 000
28	California State University System	USA	8	130	16.25	4	0	0	1		
29	Islamic Azad University	Iran	8	62	7.75	4	0	0	0		
30	Hse University National Research University Higher School of Economics	Russia	8	46	5.75	3	0	0	0	901- 1 000	343

Note: Abbreviations are available in the previous tables except: ARWU and QS = Ranking in the general ARWU and QS university rankings.  
 Source: Own elaboration.

Table 5  
Top 30 most productive and influential countries in the IM in SMEs

R	Country	TP	TC	H	C/P	Thresholds			P/Po	C/Po
						≥200	≥100	≥50		
1	USA	169	5 369	38	31.77	3	11	18	0.51	16.32
2	England	157	3 701	36	23.57	1	3	22	2.36	55.53
3	Italy	142	2 820	30	19.86	1	2	8	2.35	46.57
4	India	132	1 215	17	9.20	1	0	4	0.10	0.89
5	Spain	120	2 052	24	17.10	1	2	8	2.57	43.90
6	China	93	2 086	21	22.43	2	0	7	0.06	1.45
7	Malaysia	86	1 356	17	15.77	1	1	5	2.69	42.44
8	Australia	85	2 567	24	30.20	1	4	10	3.37	101.87
9	South Korea	62	1 014	18	16.35	0	1	4	1.21	19.79
10	France	53	809	15	15.26	0	1	5	0.81	12.42
11	Taiwan	53	1 421	22	26.81	4	0	3	2.23	59.78
12	Indonesia	49	237	8	4.84	0	0	1	0.18	0.88
13	Poland	48	235	8	4.90	0	0	0	1.27	6.20
14	Germany	47	443	12	9.43	0	0	1	0.56	5.30
15	South Africa	47	186	8	3.96	0	0	0	0.80	3.18
16	Brazil	45	271	8	6.02	0	0	2	0.21	1.28
17	Portugal	44	555	14	12.61	0	0	0	4.30	54.25
18	Japan	43	675	14	15.70	0	0	5	0.34	5.32
19	Mexico	41	165	5	4.02	0	0	1	0.32	1.29
20	Canada	40	856	17	21.40	0	1	4	0.61	13.14
21	Slovakia	37	299	10	8.08	0	0	0	6.78	54.76
22	Czech Republic	29	393	10	13.55	0	0	1	2.71	36.73
23	Netherlands	26	855	14	32.88	2	0	1	1.52	50
24	Thailand	25	155	7	6.20	0	0	0	0.36	2.23
25	New Zealand	24	501	10	20.88	0	0	4	5.02	104.81
26	Romania	24	162	7	6.75	0	0	0	1.24	8.36
27	Russia	23	104	5	4.52	0	0	0	0.16	0.71
28	Colombia	22	67	5	3.05	0	0	0	0.44	1.33
29	Pakistan	22	119	7	5.41	0	0	0	0.10	0.55
30	Iran	21	214	6	10.19	0	0	1	0.25	2.58

Note: Abbreviations available in previous tables except: P/Po and C/Po = Papers and cites per million inhabitants.

Source: Own elaboration.

### 4.3. Graphical analysis of IM in SMEs with VOSviewer

In this section, to provide a deeper analysis of the data obtained from the search, we graphically analyze bibliographic material about IM in SMEs using the VOSviewer software (van Eck & Waltman, 2010).

This program can build and view graphic maps through bibliographic coupling, analysis of citations and cocitations, coauthorship, and co-occurrence of author keywords (Caputo et al., 2018; Shukla et al., 2020).

Recall that bibliographic coupling appears when two documents cite the same third document (Kessler, 1963). Cocitation between two documents occurs when they receive a citation from the same third document. The co-occurrence of author keywords measures the most common keywords and those that appear more frequently in the same papers.

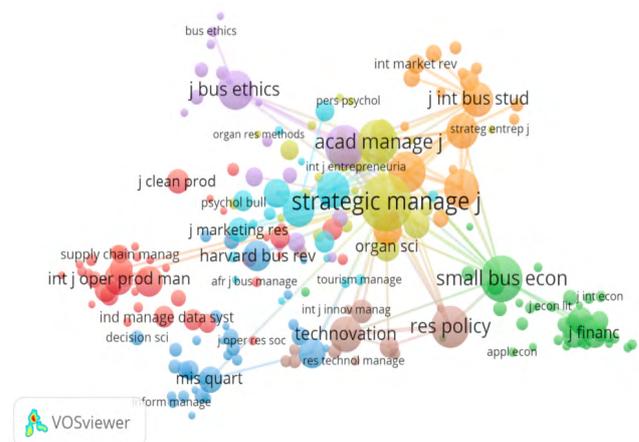


Figure 2  
Cocitation of journals cited in IM in SMEs

Source: Own elaboration.

Figure 2 presents the general visualization between 1985 and 2019 with a minimum of fifty cites and the 210 most representative connections. Note that the colours of the journals' circles indicate the cluster to which the journals belong.

Next, the bibliographic coupling of authors that publish IM in SMEs will be analyzed. Figure 3 presents the most productive authors with a minimum of two published documents and the three hundred fifty-six strongest bibliographic coupling links between authors. The advantage of this figure is the graphical mapping of authors that connects or clusters those with similar research profiles, those that cite similar bibliographic material. The results of this figure are under Table 3.

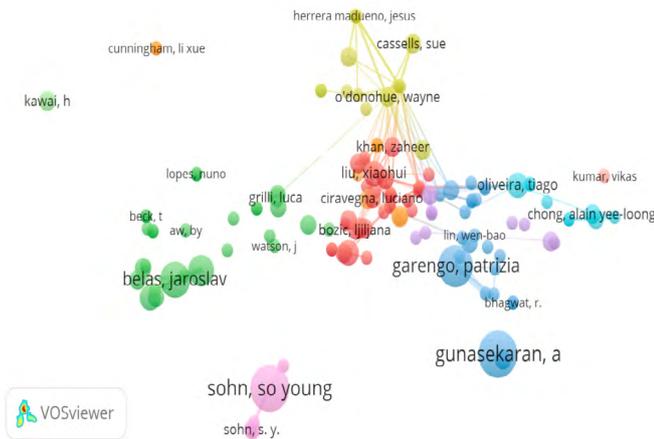


Figure 3

**Bibliographic coupling of authors that publish in IM in SMEs**

Source: Own elaboration.

Next, the bibliographic coupling of institutions will be examined. Figure 4 visualizes the data considering a minimum threshold of two documents and 119 connections. In addition to presenting as many registered documents with a higher h-index, the World Bank has a strong relationship with various institutions.

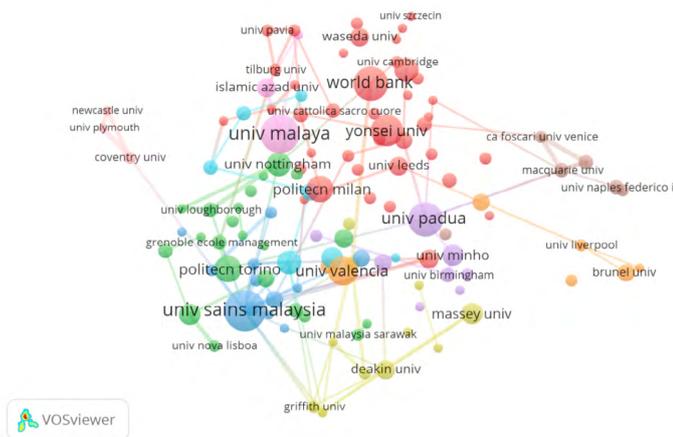


Figure 4

**Bibliographic coupling of institutions that publish in IM in SMEs**

Source: Own elaboration.

To summarize the results at the country level, Figure 5 presents the bibliographic coupling of countries with a threshold of

two documents and eighty connections. The results are under Table 5, where the USA is the most productive country, followed by England. The countries in the first positions are related to most other countries. On the other hand, countries with lower weights are related only to countries ranked first in production and data.

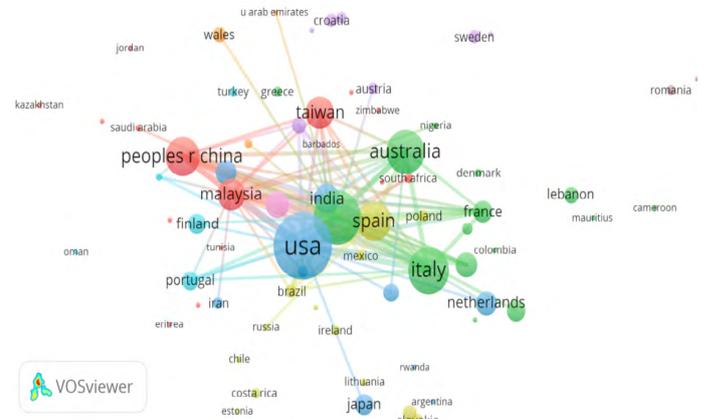


Figure 5

**Bibliographic coupling of countries that publish in IM in SMEs**

Source: Own elaboration.

Figure 6 considers the coincidence of the author's keywords of the period 1985-2019 by analyzing the main keywords of the topic IM in SMEs and considering a threshold of twelve occurrences and the forty-five most representative connections. It is noted that the larger node refers to the keywords "small and medium enterprises" as a central theme that has been carried out for the development of the research field and presents 288 Author keyword occurrences and 182 Author keyword co-occurrences links.

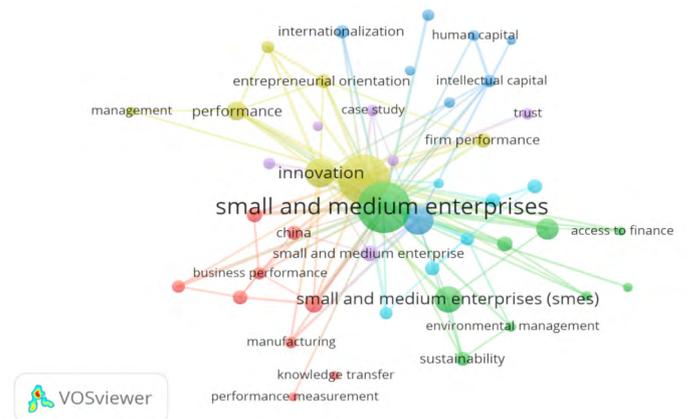


Figure 6

**Co-occurrence of author keywords of documents published in IM in SMEs**

Source: Own elaboration.

**5. CONCLUSIONS**

This work presents a general overview of the most cited articles, the leading authors, institutions, countries and journals in IM in SMEs between 1985 and 2019. In addition, different anal-

yses were performed, both at a general level for the described based on the Web of Science database (WoS) in which the sample is 1,772.

The first IM in SME was identified to have been studied primarily in 2016 and 2019. This finding indicates the recent relevance of IM in SMEs. The highest number of citations over time is shown in 2009, with 2,101 citations and 55 publications. The publications in this research area are growing exponentially, and we have to develop bibliometric tools that allow us to address the IM in SME research that is appearing in science.

Second, the analysis focused on studying a ranking of 30 authors, 30 institutions and 30 countries, leading to greater productivity in the discipline. In this ranking, one can observe an interesting discussion that reveals that the most productive institution also has the most productive country, i.e., those who have a greater quantity of published work. Furthermore, one can observe who the most influential are, i.e., those who have more citations by the scientific community.

Additionally, it is possible to observe that the most productive authors are not necessarily the most influential. Those authors are neither in the most productive institutions nor the most productive countries; only one case, Gunasekaran A, is the third most productive author.

Finally, within the IM in SMEs investigation, the keyword is "small and medium enterprises". This finding indicates the relevance of its evolution.

The results of this paper can be useful for researchers and students who want to deepen the study of IM in SMEs by providing a pathway to building a theoretical framework on the subject and appropriate analysis of new developments in IM in SMEs.

### 5.1. Future research

The study uses Web of Science as the only database; however, in future research, the results may be expanded by using other databases. IM in SMEs research will continue growing, and it is necessary to deepen the analysis of the authors, countries and universities that lead research in this discipline, which are not only the most productive authors but also the most influential.

Another important future research direction is to conduct a more in-depth analysis of these studies by country. This will be important because the realities and characteristics of each country are different, and knowing how IM is being done in different places can improve the success when migrating strategies from other countries or areas.

## 6. ACKNOWLEDGMENT

This research was funded by the Chilean Government through FONDECYT initiation, grant number 11190056. Research supported by Red Sistemas Inteligentes y Expertos Modelos Computacionales Iberoamericanos (SIEMCI), project number 522RT0130 in Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo (CYTED)

## 7. REFERENCES

- Alfaro-García, V. G., Gil-Lafuente, A. M., & Alfaro Calderón, G. G. (2017). A fuzzy methodology for innovation management measurement. *Kybernetes*, 46(1), 50-66. <https://doi.org/10.1108/K-06-2016-0153>
- Aragón-Sánchez, A., & Sánchez-Marín, G. (2005). Strategic orientation, management characteristics, and performance: A study of Spanish SMEs. *Journal of Small Business Management*, 43(3), 287-308. <https://doi.org/10.1111/j.1540-627X.2005.00138.x>
- Ayyagari, M., Beck, T., & Demirguc-Kunt, A. (2007). Small and medium enterprises across the globe. *Small Business Economics*, 29(4), 415-434. <https://doi.org/10.1007/s11187-006-9002-5>
- Beck, T., Demirguc-Kunt, A., & Levine, R. (2005). SMEs, growth, and poverty: Cross-country evidence. *Journal of Economic Growth*, 10(3), 199-229. <https://doi.org/10.1007/s10887-005-3533-5>
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2004). Bank competition and access to finance: International evidence. *Journal of Money, Credit and Banking*, 627-648.
- Bhattacharyya, S. S., & Verma, S. (2020). The intellectual contours of corporate social responsibility literature: Co-citation analysis study. *International Journal of Sociology and Social Policy*, 40(11-12), 1551-1583. <https://doi.org/10.1108/IJSSP-12-2019-0263>
- Bilton, C., & Cummings, S. (2010). *Creative strategy: Reconnecting business and innovation* (Vol. 3). John Wiley & Sons.
- Blanco-Mesa, F., Merigó, J. M., & Gil-Lafuente, A. M. (2017). Fuzzy decision making: A bibliometric-based review. *Journal of Intelligent & Fuzzy Systems*, 32(3), 2033-2050.
- Bruns, T., & Stalker, G. (1961). The management of innovation. *Tavistock, London*, 120-122.
- Byington, E. K., Felps, W., & Baruch, Y. (2019). Mapping the Journal of Vocational Behavior: A 23-year review. *Journal of Vocational Behavior*, 110, 229-244. <https://doi.org/10.1016/j.jvb.2018.07.007>
- Cancino, C. A., Merigo, J. M., Torres, J. P., & Diaz, D. (2018). A bibliometric analysis of venture capital research. *Journal of Economics, Finance and Administrative Science*, 23(45), 182-195. <https://doi.org/10.1108/JEFAS-01-2018-0016>
- Caputo, A., Marzi, G., Pellegrini, M. M., & Rialti, R. (2018). Conflict management in family businesses: A bibliometric analysis and systematic literature review. *International Journal of Conflict Management*, 29(4), 519-542. <https://doi.org/10.1108/IJCMA-02-2018-0027>
- Cassiman, B., & Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42(1), 56-75. <https://doi.org/10.1057/jibs.2010.36>
- Cooke, P., & Wills, D. (1999). Small Firms, Social Capital and the Enhancement of Business Performance Through Innovation Programmes. *Small Business Economics*, 13(3), 219-234. <https://doi.org/10.1023/A:1008178808631>
- Dangayach, G. S., & Deshmukh, S. G. (2001). Manufacturing strategy Literature review and some issues. *International Journal of Operations and Production Management*, 21(7), 884-932. <https://doi.org/10.1108/01443570110393414>
- de la Torre, A., Martínez Peria, M. S., & Schmukler, S. L. (2010). Bank involvement with SMEs: Beyond relationship lending. *Journal of Banking and Finance*, 34(9), 2280-2293. <https://doi.org/10.1016/j.jbankfin.2010.02.014>
- Dholakia, R. R., & Kshetri, N. (2004). Factors impacting the adoption of the Internet among SMEs. *Small Business Economics*, 23(4), 311-322. <https://doi.org/10.1023/B:SBEJ.0000032036.90353.1f>
- Donthu, N., Kumar, S., & Pattnaik, D. (2020). Forty-five years of Journal of Business Research: A bibliometric analysis. *Journal of Business Research*, 109, 1-14. <https://doi.org/10.1016/j.jbusres.2019.10.039>
- Escorsa, P., & Valls Pasola, J. (1997). *Tecnología e innovación en la empresa: Dirección y gestión*. Edicions UPC.

- Eveleens, C. (2010). Innovation management; a literature review of innovation process models and their implications. *Science*, 800(2010), 900-916.
- Filatotchev, I., Liu, X., Buck, T., & Wright, M. (2009). The export orientation and export performance of high-technology SMEs in emerging markets: The effects of knowledge transfer by returnee entrepreneurs. *Journal of International Business Studies*, 40(6), 1005-1021. <https://doi.org/10.1057/jibs.2008.105>
- Gassmann, O., & Keupp, M. M. (2007). The competitive advantage of early and rapidly internationalising SMEs in the biotechnology industry: A knowledge-based view. *Journal of World Business*, 42(3), 350-366. <https://doi.org/10.1016/j.jwb.2007.04.006>
- Gronum, S., Verreynne, M.-L., & Kstelle, T. (2012). The Role of Networks in Small and Medium-Sized Enterprise Innovation and Firm Performance. *Journal of Small Business Management*, 50(2), 257-282. <https://doi.org/10.1111/j.1540-627X.2012.00353.x>
- Gutiérrez-Salcedo, M., Martínez, M. Á., Moral-Munoz, J. A., Herrera-Viedma, E., & Cobo, M. J. (2018). Some bibliometric procedures for analyzing and evaluating research fields. *Applied Intelligence*, 48(5), 1275-1287. <https://doi.org/10.1007/s10489-017-1105-y>
- Herr, H., & Nettekoven, Z. M. (2018). *The role of small and medium-sized enterprises in development: What can be learned from the German experience?* Global Labour University Working Paper.
- Hervas-Oliver, J.-L., Sempere-Ripoll, F., Boronat-Moll, C., & Rojas, R. (2015). Technological innovation without R&D: unfolding the extra gains of management innovations on technological performance. *Technology Analysis and Strategic Management*, 27(1), 19-38. <https://doi.org/10.1080/09537325.2014.944147>
- Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences*, 102(46), 16569-16572.
- Hsu, Y.-H., & Fang, W. (2009). Intellectual capital and new product development performance: The mediating role of organizational learning capability. *Technological Forecasting and Social Change*, 76(5), 664-677. <https://doi.org/10.1016/j.techfore.2008.03.012>
- Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: An integration and empirical examination. *Journal of marketing*, 62(3), 42-54.
- Igartua, J. I., & Errasti, A. (2007). *La Innovación en una Corporación Industrial: El caso de MCC*. 1127-1136.
- Jamali, D., & Neville, B. (2011). Convergence Versus Divergence of CSR in Developing Countries: An Embedded Multi-Layered Institutional Lens. *Journal of Business Ethics*, 102(4), 599-621. <https://doi.org/10.1007/s10551-011-0830-0>
- Jamali, D., Zanhour, M., & Keshishian, T. (2009). Peculiar strengths and relational attributes of SMEs in the context of CSR. *Journal of Business Ethics*, 87(3), 355-377. <https://doi.org/10.1007/s10551-008-9925-7>
- Keizer, J. A., Dijkstra, L., & Halman, J. I. M. (2001). Explaining innovative efforts of SMEs. An exploratory survey among SMEs in the mechanical and electrical engineering sector in The Netherlands. *Technovation*, 22(1), 1-13. [https://doi.org/10.1016/S0166-4972\(00\)00091-2](https://doi.org/10.1016/S0166-4972(00)00091-2)
- Kessler, M. M. (1963). Bibliographic coupling between scientific papers. *American documentation*, 14(1), 10-25.
- Keupp, M.M., Palmié, M. and Gassmann, O., 2012. The strategic management of innovation: a systematic review and paths for future research. HYPERLINK "http://www.emeraldinsight.com/action/showLinks?crossref=10.1111%2Fj.1468-2370.2011.00321.x&i-si=000310542700001" *International Journal of Management Reviews*, 14(4), 367-390.
- Knight, G. A., & Kim, D. (2009). International business competence and the contemporary firm. *Journal of International Business Studies*, 40(2), 255-273. <https://doi.org/10.1057/palgrave.jibs.8400397>
- Kokol, P., Saranto, K., & Blažun Vošner, H. (2018). eHealth and health informatics competences: A systemic analysis of literature production based on bibliometrics. *Kybernetes*, 47(5), 1018-1030. <https://doi.org/10.1108/K-09-2017-0338>
- Liesch, P. W., & Knight, G. A. (1999). Information internalization and hurdle rates in small and medium enterprise internationalization. *Journal of International Business Studies*, 30(2), 383-394. <https://doi.org/10.1057/palgrave.jibs.8490075>
- Lissoni, F. (2001). Knowledge codification and the geography of innovation: The case of Brescia mechanical cluster. *Research Policy*, 30(9), 1479-1500. [https://doi.org/10.1016/S0048-7333\(01\)00163-9](https://doi.org/10.1016/S0048-7333(01)00163-9)
- Man, T. W. Y., Lau, T., & Chan, K. F. (2002). The competitiveness of small and medium enterprises: A conceptualization with focus on entrepreneurial competencies. *Journal of Business Venturing*, 17(2), 123-142. [https://doi.org/10.1016/S0883-9026\(00\)00058-6](https://doi.org/10.1016/S0883-9026(00)00058-6)
- Martínez-López, F. J., Merigó, J. M., Gázquez-Abad, J. C., & Ruiz-Real, J. L. (2020). Industrial marketing management: Bibliometric overview since its foundation. *Industrial Marketing Management*, 84, 19-38. <https://doi.org/10.1016/j.indmarman.2019.07.014>
- Merigó, J. M., Gil-Lafuente, A. M., & Yager, R. R. (2015). An overview of fuzzy research with bibliometric indicators. *Applied Soft Computing Journal*, 27, 420-433. <https://doi.org/10.1016/j.asoc.2014.10.035>
- Merigó, J. M., Pedrycz, W., Weber, R., & de la Sotta, C. (2018). Fifty years of Information Sciences: A bibliometric overview. *Information Sciences*, 432, 245-268. <https://doi.org/10.1016/j.ins.2017.11.054>
- Merigó, J. M., & Yang, J.-B. (2017). A bibliometric analysis of operations research and management science. *Omega (United Kingdom)*, 73, 37-48. <https://doi.org/10.1016/j.omega.2016.12.004>
- Naidoo, V. (2010). Firm survival through a crisis: The influence of market orientation, marketing innovation and business strategy. *Industrial Marketing Management*, 39(8), 1311-1320. <https://doi.org/10.1016/j.indmarman.2010.02.005>
- Narula, R. (2002). Innovation systems and «inertia» in R&D location: Norwegian firms and the role of systemic lock-in. *Research Policy*, 31(5), 795-816. [https://doi.org/10.1016/S0048-7333\(01\)00148-2](https://doi.org/10.1016/S0048-7333(01)00148-2)
- Noci, G., & Verganti, R. (1999). Managing «green» product innovation in small firms. *R and D Management*, 29(1), 3-15. <https://doi.org/10.1111/1467-9310.00112>
- OECD. (2005). Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data. *Paris and Luxembourg: OECD/Euro-stat*.
- Perrini, F. (2006). SMEs and CSR theory: Evidence and implications from an Italian perspective. *Journal of Business Ethics*, 67(3), 305-316. <https://doi.org/10.1007/s10551-006-9186-2>
- Porter, M. E. (1998). *Competitive strategy: Techniques for analyzing industries and competitors: With a new introduction*.
- Radas, S., & Božić, L. (2009). The antecedents of SME innovativeness in an emerging transition economy. *Technovation*, 29(6-7), 438-450. <https://doi.org/10.1016/j.technovation.2008.12.002>
- Rey-Martí, A., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2016). A bibliometric analysis of social entrepreneurship. *Journal of Business Research*, 69(5), 1651-1655. <https://doi.org/10.1016/j.jbusres.2015.10.033>
- Rialti, R., Marzi, G., Ciappei, C., & Busso, D. (2019). Big data and dynamic capabilities: A bibliometric analysis and systematic literature review. *Management Decision*, 57(8), 2052-2068. <https://doi.org/10.1108/MD-07-2018-0821>
- Sarkodie, S. A., & Strezov, V. (2019). A review on Environmental Kuznets Curve hypothesis using bibliometric and meta-analysis. *Science of the Total Environment*, 649, 128-145. <https://doi.org/10.1016/j.scitotenv.2018.08.276>
- Shah, S. H. H., Lei, S., Ali, M., Doronin, D., & Hussain, S. T. (2020). Prosumption: Bibliometric analysis using HistCite and VOSviewer. *Kybernetes*, 49(3), 1020-1045. <https://doi.org/10.1108/K-12-2018-0696>

- Shukla, N., Merigó, J. M., Lammers, T., & Miranda, L. (2020). Half a century of computer methods and programs in biomedicine: A bibliometric analysis from 1970 to 2017. *Computer Methods and Programs in Biomedicine*, 183. <https://doi.org/10.1016/j.cmpb.2019.105075>
- Solano Acosta, A., Herrero Crespo, Á., & Collado Agudo, J. (2018). Effect of market orientation, network capability and entrepreneurial orientation on international performance of small and medium enterprises (SMEs). *International Business Review*, 27(6), 1128-1140. <https://doi.org/10.1016/j.ibusrev.2018.04.004>
- Terziovski, M. (2010). Research notes and commentaries innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: A resource-based view. *Strategic Management Journal*, 31(8), 892-902. <https://doi.org/10.1002/smj.841>
- Torres-Ortega, R., Rialp-Criado, A., Rialp-Criado, J., & Stoian, M.-C. (2015). How to measure born-global firms' orientation towards international markets? *Revista Española de Investigación de Marketing ESIC*, 19(2), 107-123.
- Torugsa, N. A., O'Donohue, W., & Hecker, R. (2012). Capabilities, Proactive CSR and Financial Performance in SMEs: Empirical Evidence from an Australian Manufacturing Industry Sector. *Journal of Business Ethics*, 109(4), 483-500. <https://doi.org/10.1007/s10551-011-1141-1>
- Tsai, W.-H., & Chou, W.-C. (2009). Selecting management systems for sustainable development in SMEs: A novel hybrid model based on DEMATEL, ANP, and ZOGP. *Expert Systems with Applications*, 36(2 PART 1), 1444-1458. <https://doi.org/10.1016/j.eswa.2007.11.058>
- van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523-538. <https://doi.org/10.1007/s11192-009-0146-3>
- van Nunen, K., Li, J., Reniers, G., & Ponnet, K. (2018). Bibliometric analysis of safety culture research. *Safety Science*, 108, 248-258. <https://doi.org/10.1016/j.ssci.2017.08.011>
- Volberda, H. W., Van Den Bosch, F. A. J., & Heij, C. V. (2013). Management innovation: Management as fertile ground for innovation. *European Management Review*, 10(1), 1-15. <https://doi.org/10.1111/emre.12007>
- Walker, R. M., Damanpour, F., & Devece, C. A. (2011). Management innovation and organizational performance: The mediating effect of performance management. *Journal of Public Administration Research and Theory*, 21(2), 367-386. <https://doi.org/10.1093/jopart/muq043>
- Wong, P. K., Ho, Y. P., & Autio, E. (2005). Entrepreneurship, innovation and economic growth: Evidence from GEM data. *Small Business Economics*, 24(3), 335-350. <https://doi.org/10.1007/s11187-005-2000-1>
- Yew Wong, K. (2005). Critical success factors for implementing knowledge management in small and medium enterprises. *Industrial Management & Data Systems*, 105(3), 261-279. <https://doi.org/10.1108/02635570510590101>
- Zhou, L., Wu, W.-P., & Luo, X. (2007). Internationalization and the performance of born-global SMEs: The mediating role of social networks. *Journal of International Business Studies*, 38(4), 673-690. <https://doi.org/10.1057/palgrave.jibs.8400282>