



# Bibliometric analysis of research on business innovation

## Análisis bibliométrico de la investigación sobre innovación


 <https://doi.org/10.21803/adgnosis.12.12.614>

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### How to cite this article:

Acosta-Tzin, J.; Raudales-García, W. and Aguilar-Hernández, P. (2023). Bibliometric analysis of business innovation research. *Ad-Gnosis*, 12(12). p. 1-14. <https://doi.org/10.21803/adgnosis.12.12.614>

### Abstract

**Introduction:** Business innovation is a determining factor to achieve success in the market, it is a key element to remain competitive or disappear, this allows to improve processes in production, create new products or services. **Objective:** The purpose of this research was to conduct a bibliometric analysis of the scientific production related to business innovation. **Methodology:** This study was descriptive in scope and used the bibliometric technique to analyze the scientific production related to business innovation in the Scopus database. Boolean operators and a search equation were applied to improve the precision of the results obtained. **Results:** It is evidenced that, the subject of study in the course of time presents a moderate growth trend between the years 2019-2020, being the United Kingdom the country with the highest scientific production, the most cited and relevant article is the authorship; Noordhoff C.S., Kyriakopoulos K., Moorman C., Pauwels P. and Dellaert B.G.C, likewise the most prolific journal according to Bradford's analysis is the Journal Of Technology Management And Innovation. **Conclusion:** It is concluded that business innovation is a topic of great relevance in management disciplines for both academia and organizations since it is a crucial element for business success in an increasingly competitive environment.

**Keywords:** Bibliometrics; Entrepreneurship; Innovation; Research and Development; Business.

**Códigos JEL:** E24, E26, Q55

### Resumen

**Introducción:** La innovación empresarial es un factor determinante para alcanzar el éxito en el mercado, es un elemento clave para mantenerse competitivo o desaparecer, esta permite mejorar los procesos en la producción, crear nuevos productos o servicios. **Objetivo:** El propósito de esta investigación fue llevar a cabo un análisis bibliométrico de la producción científica relacionada con la innovación empresarial. **Metodología:** Este estudio tuvo un alcance descriptivo y utilizó la técnica de la bibliometría para analizar la producción científica relacionada con la innovación empresarial en la base de datos de Scopus. Se aplicaron operadores booleanos y una ecuación de búsqueda con el objetivo de mejorar la precisión de los resultados obtenidos. **Resultados:** Se evidencia que, el tema de estudio en el transcurso del tiempo presenta una tendencia moderada de crecimiento entre los años 2019-2020, siendo el Reino Unido el país con mayor producción científica, el artículo más citado y relevante es la autoría; Noordhoff C.S., Kyriakopoulos K., Moorman C., Pauwels P. y Dellaert B.G.C, asimismo la revista más prolifera según el análisis de Bradford es la Journal Of Technology Management And Innovation. **Conclusión:** Se concluye que la innovación empresarial es un tema de gran relevancia en las disciplinas administrativas tanto para la academia como para las organizaciones, ya que se trata de un elemento crucial para el éxito empresarial en un entorno cada vez más competitivo.

**Palabras clave:** Bibliometría; Emprendimiento; Innovación; Investigación y Desarrollo; Negocios.

## Introduction

In recent decades, business innovation has acquired significant relevance in the business world in general. This concept enables the development of business strategies that generate growth and success for companies. Some highlights of business innovation are: technology and digitalization, innovative strategies, innovation culture, management and flexibility to change, as well as processes for measuring and evaluating the impact of innovation on business performance (Becerra Rodríguez & Álvarez Giraldo, 2011). Therefore, it is essential to carry out research that analyzes the studies carried out by different authors and contributes with solid bases for future research.

According to Tomás-Górriz & Tomás-Casterá (2018), bibliometrics as a discipline has had two major areas of development and application since its inception. First, it has been used for the study of science and the evaluation of scientific production. Secondly, it has been applied in editorial management. Dávila Rodríguez et al. (2009) mention that the main objective of this technique is to analyze scientific production and its impact on different sectors. Therefore, in this study bibliometrics was used as a research technique and tool.

In relation to the above, a theoretical framework was developed to understand the different concepts, current situation and trends of business innovation in existing research, carrying out a methodology designed to identify the important properties and characteristics of this phenomenon using a search equation in the Scopus database to ensure relevant information and thus developing the conclusions. In this sense, the objective of this research was to carry out a bibliometric analysis of the scientific production related to business innovation.

## THEORETICAL FRAMEWORK

Business innovation as a key element for success is a term that in these times has taken a preponderant importance as it can be the difference between remaining or disappearing from the market, in a globalized world innovation is a hard work that companies should do as a daily practice, innovation should be a process that encourage and go hand in hand with corporate social responsibility as this will give the business a competitive advantage that not only benefits the company as such but also to all its environment and stakeholders (Canizales Muñoz, 2020; Guzmán et al., 2020; Pérez Cruz, 2019).

According to Pérez (2019), business innovation is a trend that is difficult to ignore nowadays and has become indispensable to create a competitive advantage in a market that is increasingly demanding in terms of products and services. Some academics argue that innovation in companies is related to their size, as they consider that the economic factor is a determining factor. According to this perspective, investment in research and development is key to business success (Sulistyo & Ayuni, 2019; Vélez et al., 2019).

On the other hand, according to Arzola and Mejías (2007), business innovation is a determining factor for companies to reach the optimum dimensions to compete in today's market and to create management system models based on each process, to optimize production and business structure, increase the quality of service and make better decisions. Innovation is related to the success of large, medium and small companies; the resources that companies allocate to research and development and innovation (R&D&I) will allow them to develop sustainability and efficient management of commercial strategies and the generation of new ideas (Parga-Dans et al., 2013; Quintana, 2005).

The capacity for business innovation is one of the most important factors in achieving business competitiveness and impact on internal performance and generation of sustainable competitive advantages (generation of innovative ideas, implementation of technology), as well as the set of practices and attitudes to implement it (Martínez Garcés & Padilla Delgado, 2020; Santa María et al., 2010). In a changing environment, cooperation between companies drives innovation and mutual benefit to develop products and services with optimal standards that meet market needs that would be difficult to achieve in isolation (Castro et al., 2018; Garza et al., 2010).

In this sense, there are different types of innovation, one has to do with marketing innovations, which are characterized by making visible changes in products, such as the redesign of packaging and presentation; another type of innovation is known as product innovation, which occurs when certain key conditions are met, such as novelty and usefulness; In this case, new production techniques are implemented, thus offering the customer a significant improvement, and finally, organizations can innovate from their processes, that is, by introducing new inventory management, distribution and production methods (Orfila-Sintes & Mattsson, 2003; Palacio-Fierro et al., 2017)

According to Ruiz Font et al. (2015), the success of business innovation is directly related to characteristics such as; effective communication, planning and business development, thereby generating effective strategies to optimize production, improve or create products that adapt to market needs, correctly manage the client portfolio and acquire new knowledge. Research highlights the importance of innovation as a key factor in improving business efficiency and competitiveness, allowing adaptation to market changes and resource optimization (Gallardo Vázquez & Sánchez-Hernández, 2013; Vega-Jurado et al., 2008).

The World Intellectual Property Organization, in its 2022 Innovation Report, has assessed 132 economies globally with the participation of more than 193 members in the World Forum. The research analyzes several variables related to investment in technology and innovation, technological progress and adaptation, and socioeconomic assessment. The report concludes that investment in Research, Development and Innovation (R&D&I) worldwide has experienced exponential growth since 2020, and an increase in the number of registered patents has been observed. Therefore, it is essential to create an innovation ecosystem that fosters and supports technological development and innovation (World Intellectual Property Organization [WIPO], 2022).

In recent years, innovation in companies has been affected by various factors, such as natural phenomena, social conflicts and an incipient and weak democracy. Without a doubt, access to financial resources in this context is a limiting factor for the different sectors and is one of the barriers to overcome; today's world requires quality standards for the products it produces and innovation in this sense must go hand in hand to meet the demands of the global market (Madrid & Vega, 2022).

## METHODOLOGY

In this paper, a detailed analysis of the scientific production on business innovation is carried out, using bibliometrics as a research technique and tool. The scope of this research is descriptive, which consisted of identifying the important properties and characteristics of this phenomenon (Hernández Sampieri & Fernández Collado, 2014). Information was obtained through the counting and classification of documents using the Scopus database where relevant and authoritative research is quickly found, identifies experts and provides access to reliable data, metrics and analytical tools.

To perform the search, the fields "Article title" and "Search documents" were selected using the keyword "business innovation". No time parameter restrictions were applied. Data extraction was performed on May 6, 2023. The search was limited to the subject area of business, management and accounting "BUSI", the document type "ar" articles in their final stage "final", and the journals "j" open access OA, "all". Boolean operators were used to improve the precision of the search results (Villegas, 2003).

The resulting search equation was: TITLE ("business innovation") AND (LIMIT-TO (SUBJAREA, "BUSI")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (OA, "all")).

Thirty-eight scientific articles associated with the topic were obtained. The data were exported from Scopus in "CSV" and plain text (".RIS") formats for subsequent processing in Microsoft® Excel® for Microsoft 365 Education and VOSviewer, a specialized tool for establishing and representing bibliometric networks (Orduña-Malea & Costas, 2021).

Finally, the results were grouped according to bibliometric indicators that measure scientific production. These indicators include: (a) temporal distribution, using DeSolla Price's law of exponential growth of science as explained in Price (1976) and calculating the adjusted coefficient of determination (R<sup>2</sup>); (b) the number of publications per country; (c) the identification of the most cited and relevant articles; (d) the estimation of the most prolific authors through Lotka's Law (Urbizagástegui, 1999); (e) the analysis of the scientific journals with the highest impact using Bradford's Law (Urbizagástegui Alvarado, 1996); and (f) the analysis of co-authorship networks and the co-occurrence of keywords or Zipf's Law (Urbizagástegui Alvarado & Restrepo Arango, 2011) using fragmentation analysis with visualization of temporal and thematic trends (Perianes-Rodríguez et al., 2016).

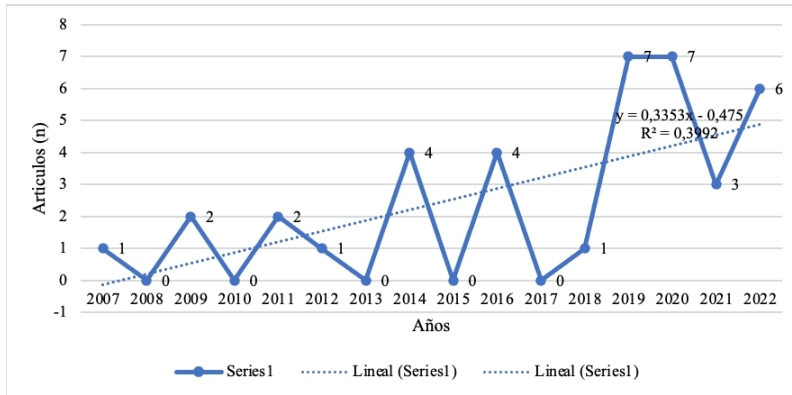
## RESULTS

### *DISTRIBUTION OF SCIENTIFIC PRODUCTION BY YEAR*

Figure 1 shows an exponential growth trend in scientific production on the topic of business innovation, with positive results during the years 2019-2020. A moderate coefficient of determination of  $R^2$ : 0.3992 was obtained.

**Figure 1**

*Trend of the temporal distribution of scientific production in research on business innovation.*



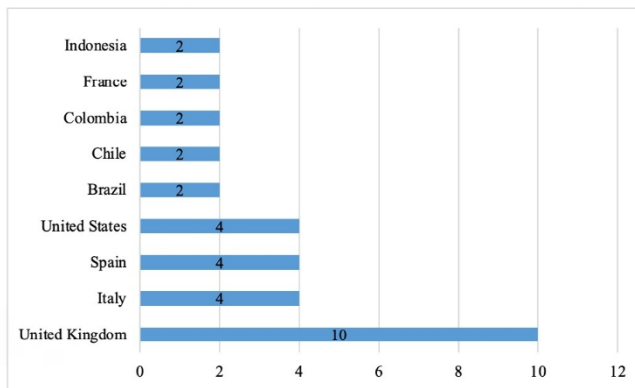
Source: Own elaboration through data obtained from the Scopus 2023 database.

### *PUBLICATIONS BY COUNTRY*

Figure 2 shows that the United Kingdom had a high participation in scientific production, contributing 31% of the total, which indicates a strong concentration of scientific research in this country and the development of a critical mass in the subject of study.

**Figure 2**

*Trend of publication by country in research on business innovation*



Source: Own elaboration based on data obtained from the Scopus 2023 database.

*MOST CITED AND RELEVANT ARTICLES*

Table 1 shows that the most cited and relevant article in the study period is 'The bright side and dark side of embedded ties in business-to-business innovation', published in 2011 by authors Noordhoff C.S., Kyriakopoulos K., Moorman C., Pauwels P., and Dellaert B.G.C. The study focused on whether supplier-customer linkages promote or hinder innovation, and uncovers specific characteristics that facilitate the promotion of business innovation. The second most cited article is 'Unlocking innovation potential: A typology of family business innovation postures and the critical role of the family system', published in 2019 by authors Rondi E., De Massis A. and Kotlar J. with 101 citations. This article focuses on how succession in family businesses drives and optimizes innovation management in firms. A third most cited and relevant article is The intervening effect of business innovation capability on the relationship between Total Quality Management and technological innovation 2009 by authors; Perdomo-Ortiz J.; González-Benito J.; Galende J. with 67 citations at present.

**Table 1**  
Most cited and relevant articles

Article Name	Authors	Year	Quotations	Reference
The bright side and dark side of embedded ties in business-to-business innovation	Noordhoff C.S.; Kyriakopoulos K.; Moorman C.; Pauwels P.; Dellaert B.G.C.	2011	198	(Noordhoff et al., 2011).
Unlocking innovation potential: A typology of family business innovation postures and the critical role of the family system.	Rondi E.; De Massis A.; Kotlar J.	2019	101	(Rondi et al., 2019)
The intervening effect of business innovation capability on the relationship between Total Quality Management and technological innovation	Perdomo-Ortiz J.; Gonzalez-Benito J.; Galende J.	2009	67	(Perdomo-Ortiz et al., 2009).
The impact of business innovation modes on SME innovation performance in post-Soviet transition economies: The case of Belarus	Apanasovich N.; Alcalde Heras H.; Parrilli M.D.	2016	59	(Apanasovich et al., 2016)
Do stakeholder capabilities promote sustainable business innovation in small and medium-sized enterprises? Evidence from Italy	Veronica S.; Alexeis G.-P.; Valentina C.; Elisa G.	2020	57	(Veronica et al., 2020)
Business innovation modes and their impact on innovation outputs: Regional variations and the nature of innovation across EU regions.	Parrilli M.D.; Balavac M.; Radicic D.	2020	43	(Parrilli et al., 2020).
The role of Technological Business Incubators in supporting business innovation in China: a case of regional adaptability?	Xiao L.; North D.	2018	35	(Xiao & North, 2018)
Private equity and the innovation strategies of entrepreneurial firms: Empirical evidence from the small business innovation research program	Link A.N.; Ruhm C.J.; Siegel D.S.	2014	27	(Link et al., 2014)

Article Name	Authors	Year	Quotations	Reference
Business innovation and critical success factors in the era of digital transformation and turbulent times	Florek-Paszowska A.; Ujwary-Gil A.; Godlewska-Dzioboń B.	2021	24	(Florek-Paszowska et al., 2021).
Employment growth from the Small Business Innovation Research program	Link A.N.; Scott J.T.	2012	21	(Link & Scott, 2012)

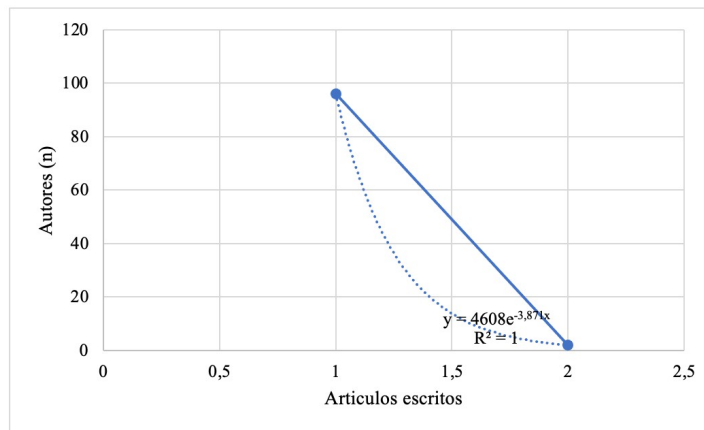
Source: Own elaboration through data obtained from the Scopus 2023 database.

### ANALYSIS OF THE MOST PROLIFIC AUTHORS

Figure 3 shows the distribution that describes the frequency of occurrence of events, in this case, the number of scientific publications produced by different authors, with a coefficient of determination (R<sup>2</sup>) of 1. According to Lotka's Law, it is estimated that the generation of knowledge comes mainly from a small group of prolific authors. In this study, it has been considered that this group is made up of  $\sqrt{98} \approx 10$ , equivalent to the square root of 98, authors who have written on the subject.

**Figura 3**

Análisis de los autores más prolíficos



Source: Own elaboration based on data obtained from the Scopus 2023 database.

### BRADFORD INDEX ANALYSIS

Table 2 shows that, according to the Bradford index, the most productive journal in the subject of study is the Journal Of Technology Management And Innovation, with the highest scientific production and the highest volume of access, ranked first in the nuclear zone of the 10 most important journals. This journal has a cumulative frequency of 4 in zone 1 in the range of 4 to 13. It is important to note that the journal Entrepreneurship, Management And Innovation has a representative participation, being the second most prolific journal.

**Table 2**  
Bradford index analysis

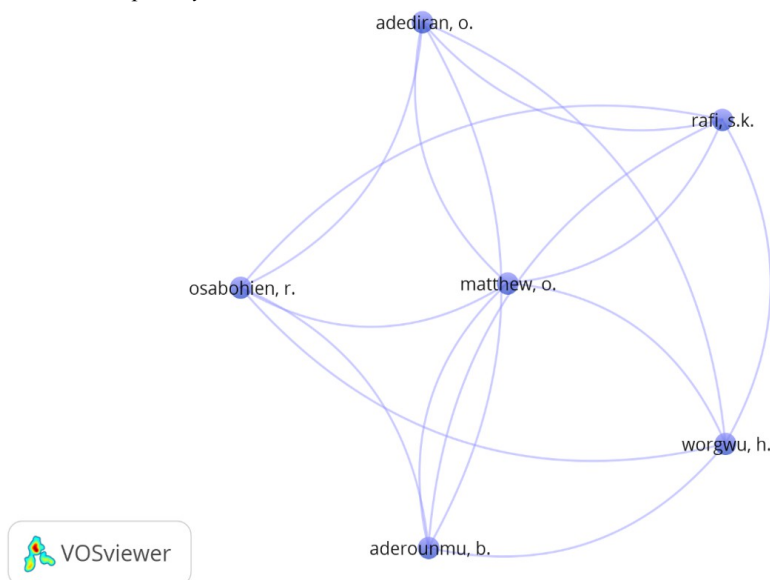
Revista	Rank	Frecuencia	Frecuencia acumulada	Zona
Journal Of Technology Management and Innovation	1	4	4	Zona 1
Journal Of Entrepreneurship, Management, and Innovation	2	2	6	Zona 1
Managerial And Decision Economics	3	2	8	Zona 1
Business Systems Research	4	1	9	Zona 1
Contemporary Economics	5	1	10	Zona 1
Engineering Economics	6	1	11	Zona 1
Entrepreneurship And Regional Development	7	1	12	Zona 1
Frontiers In Sports and Active Living	8	1	13	Zona 1
Innovar	9	1	14	Zona 2
International Business Review	10	1	15	Zona 2

Source: Own elaboration based on data obtained from the Scopus 2023 database.

### CO-AUTHORSHIP NETWORK ANALYSIS

The cluster analysis and co-authorship network reveal that authors Adediran, O., Rafi, S.K., Osabo-hien, R., Matthew O., Worgwu, H. and Aderounmu, B. collaborated on five research related to entrepreneurial innovation during the study period, as can be seen in Figure 4.

**Figure 4**  
Co-authorship analysis



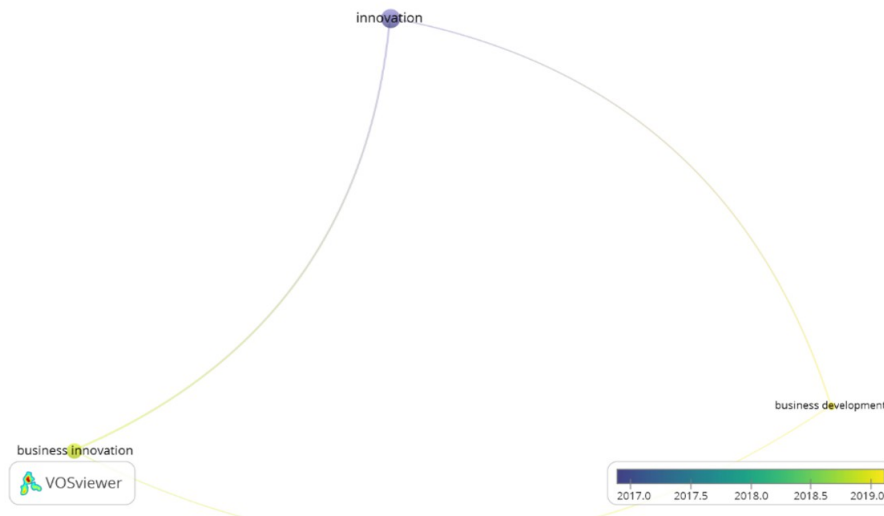
Source: Co-authored network. Figure developed with VOSviewer software with data obtained from Scopus 2023.



### KEYWORD CO-OCCURRENCE ANALYSIS

Figure 5 presents the concurrence of the most used keywords in business innovation research, identifying 3 main clusters that group the most relevant keywords. These clusters are: Cluster 1: Business innovación (Business innovation), Cluster 2: Innovación (Innovation); Cluster 3: Business development (Businessdevelopment).

**Figure 5**  
Keyword co-occurrence analysis



Source: Cooccurrence network. Figure developed with VOSviewer software with data obtained from Scopus 2023.

### DISCUSSION

The bibliometric review reveals an increase in scientific output contributing to the critical mass between 2019 and 2020 in the Scopus database. In this context, the United Kingdom stands out as the leading country in scientific content generation, thanks to its rich scientific tradition and history, solid research infrastructure, research funding, international rankings and academic prestige. The most cited topics focus on characteristics that promote or hinder innovation in business. The most productive journal in relation to the topic of business innovation is Uncertain Supply Chain Management. The co-authorship network consists of authors Adediran, O., Rafi, S.K., Osabohien, R., Matthew O., Worgwu, H. and Aderounmu, B, with keywords such as business innovation, innovation and business development.

Business innovation from the theoretical position defined by Porter and Kramer (1985), where operational efficiency leads companies to continuous improvement, quality, speed and better use of resources.

This is another way to innovate, of course it is not the only way, since innovation is not something static, but rather dynamic, and should therefore be a daily practice of companies and organizations that do not want to be left behind in a market as competitive as the present one. For other authors innovation etymologically speaking comes from the Latin *innovare*, which means to change or alter things by introducing novelties that are really palpable and that the customer feels that way (González Bañales, 2008; Garzón & Ibarra, 2013; Gómez-Zuluaga, 2019).

It is important to highlight that worldwide the companies that currently lead the innovation rankings are those that undoubtedly have a futuristic vision of world markets and that bet on structural changes in their way of doing business in the world, normally these are focused on the technological area and aim to solve problems in different areas such as health, construction of smart cities and generation of clean energies that are environmentally friendly, The primary occurrence is, of course, the world market that requires these innovations, which involves different agents that exchange tacit and explicit knowledge (Hidalgo et al., 2006), 2008; Solís Vázquez et al., 2019; Cuevas-Vargas et al., 2020).

According to Canizales Muñoz (2020), the impact of business innovation is a task that must go hand in hand with social responsibility, it cannot be a practice divorced from a strong decision with environmental protection issues, Likewise, companies with strong commitments to social responsibility issues are not only highly profitable but also position themselves favorably in the markets in which they participate, innovating nowadays represents going out or staying in the market, so innovation cannot be a minor issue, but if it is done hand in hand with respect, ethics and thinking about the common good, it is much better.

It is important to mention that the Scopus database is a reliable source of data that contains scientific production from different disciplines and countries related to business innovation research. However, it is important to note that this bibliometric study has certain limitations due to the fact that the database is constantly being updated, which may affect the information obtained depending on the search times.

## CONCLUSIONS

This bibliometric review shows the importance of business innovation in the thematic area of business, management and accounting. An important topic in the field of business innovation is the promotion of growth in companies through business development, which includes aspects such as the generation of new commercial opportunities, the creation of alliances to obtain materials, the penetration of new markets and the development of innovative products, all aimed at achieving greater profitability. The present findings provide a basis for future research using different methodologies that will allow a greater understanding of the subject of innovation in companies.

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