

## Artículo de revisión

### Exploring the evolution and trends of innovative entrepreneurship: a bibliometric analysis

### Explorando la evolución y tendencias del emprendimiento innovador: un análisis bibliométrico

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#### ABSTRACT

Innovative entrepreneurship is highly significant for fostering new opportunities that add value to businesses and society; it is a field of study that necessitates regular monitoring of the state of the art.

This paper aims to conduct a bibliometric analysis of innovative entrepreneurship to identify its intellectual structure and research trends, sourcing literature from Scopus and Web of Science (WoS) to conduct a bibliometric analysis. Researchers applied the Tree of Science (ToS) algorithm to discern an intellectual structure by drawing an analogy with roots, trunk, and branches, retrieving 1654 documents from Scopus and 680 from WoS, amounting to 1 795 non-duplicate documents; they observed a growing trend in scientific production, complemented by findings regarding countries, journals, authors, and their collaboration networks. Three significant trends emerged in the analysis using ToS: 1) Strategic Entrepreneurship, Digital Transformation, and Higher Education; 2) Technology as a Keystone in Entrepreneurial Innovation Ecosystems; and 3) Public Policy and Innovation Dynamics in Entrepreneurial Development. Researchers concluded that innovative entrepreneurship remains an inexhaustible field requiring further research development.

**Keywords:** Innovative Entrepreneurship; Bibliometric Analysis; Technological Management; Socio-Economic Development; Research Trends.

#### RESUMEN

El emprendimiento innovador es muy útil para crear nuevas oportunidades que generen valor para la sociedad y las empresas. Es un campo de estudio que requiere un seguimiento constante del estado del arte, por lo que el objetivo de este trabajo es realizar un análisis bibliométrico sobre emprendimiento innovador para identificar su estructura intelectual y tendencias de investigación. Para lograr esto, se buscó información en Scopus y Web of Science (WoS), y se llevó a cabo un análisis bibliométrico. Se aplicó el algoritmo de Tree of Science (ToS) para encontrar la estructura intelectual mediante la analogía con las raíces, el tronco y las ramas. Se encontraron 1 654 documentos en Scopus y 680 en WoS, para un total de 1 795 documentos sin duplicados. Se encontró una tendencia creciente en la producción científica que se complementa con hallazgos sobre países, revistas, autores y sus redes de colaboración. Emergieron Tres tendencias reelevates en el análisis mediante ToS: 1) Strategic Entrepreneurship, Digital Transformation, and Higher Education, 2) Technology as a Keystone in Entrepreneurial Innovation Ecosystems, 3) Public Policy and Innovation Dynamics in Entrepreneurial Development. Se concluye que el emprendimiento innovador permanece como un campo inagotado que requiere el desarrollo de más investigaciones.

**Palabras clave:** emprendimiento innovador; análisis bibliométrico; gestión tecnológica; desarrollo

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socioeconómico; tendencias de investigación.

**JEL:** M2; M3.

## INTRODUCTION

Innovative Entrepreneurship (IE) is known for its ability to harness human creativity to launch companies in the market with novel products and services, as not all entrepreneurial ventures are innovative; it has established itself as a topic of paramount importance in contemporary economics, linking knowledge and innovation to enable all types of businesses to seize new opportunities that allow them to gain a foothold in the market (Elert & Henrekson, 2021; Malerba & McKelvey, 2020).

IE typically involves a collaborative and decentralized process that engages various stakeholders and necessitates a business culture that fosters resilience to overcome the challenges commonly encountered when introducing a product or service into the market (Sharif, 2012).

It is equally important to recognize the potential of IEs to create value, contribute to societal progress, and impact socioeconomic development, making them a highly relevant issue for developing countries (Marcotte, 2014); they can arguably be an effective response to economic crisis or uncertainty, as it seeks to integrate entrepreneurship and innovation from ideation to product commercialization (Angulo, 2021).

Hence, it is crucial to keep track of the background in the state of the art, which improves continuously; the study focuses on optimal structural designs to drive innovation and performance in organizations, specifically in small high-tech firms since IE (Bodolica & Spraggon, 2020) allows identifying skills such as operational contingencies, and managerial effort for strategic purposes.

Consequently, this article aims to conduct a bibliometric analysis of IE to identify its intellectual structure and research trends, carrying out bibliometric analysis and content analysis by consulting Scopus and Web of Science (WoS) and using the Tree of Science (ToS) algorithm to discern the intellectual structure through the analogy of roots, trunk, and branches.

Thus, this paper presents an innovative approach in its content and by triangulating sources, as bibliometric analyses are typically conducted based on searches in a single database.

The following section of the article details the methodology employed, subsequently presenting and discussing results, ending with their respective conclusions.

## METHODOLOGY

Table 1 summarizes the parameters of the search conducted in Scopus and WoS. Considering the potential for multidisciplinary contributions to IE, researchers applied no filters for fields of knowledge; they found 1795 scientific documents, including articles, book chapters, books, conference papers, editorials, and notes.

They accomplished this query by the search equation listed in the table below.

**Table 1.** Search Parameters and Results for IE in WoS and Scopus Databases

PARAMETERS	WEB OF SCIENCE	SCOPUS
Range	2000 - 2023	
Date	02/01/2024	
Document types	All types	
Search words	Title-Abstract-Keywords: (“innovat* entrepreneur*” OR “innovat* venture” OR “emprendimiento innovador”)	
Results	680	1 654
Total (Wos+Scopus)	1 795	

**Source:** Own elaboration based on data from the WoS and Scopus.

Researchers divided the methodology into a Scientometric analysis and the application of the ToS. Scientometrics involves quantitative analysis of scientific production (Robledo-Giraldo et al., 2023), requiring analyses of the annual scientific production done by countries, journals, and scientific collaborations; this provides new researchers interested in IE with a comprehensive overview of the subject.

The ToS algorithm was applied to identify the foundational articles (root), the structure they provide (trunk), and emerging trends (branches); this algorithm has been extensively used in various fields (Botero et al., 2023; Díez et al., 2022; Duque et al., 2024; Grisales A. et al., 2023; Robledo-Giraldo et al., 2023; Vivares et al., 2022).

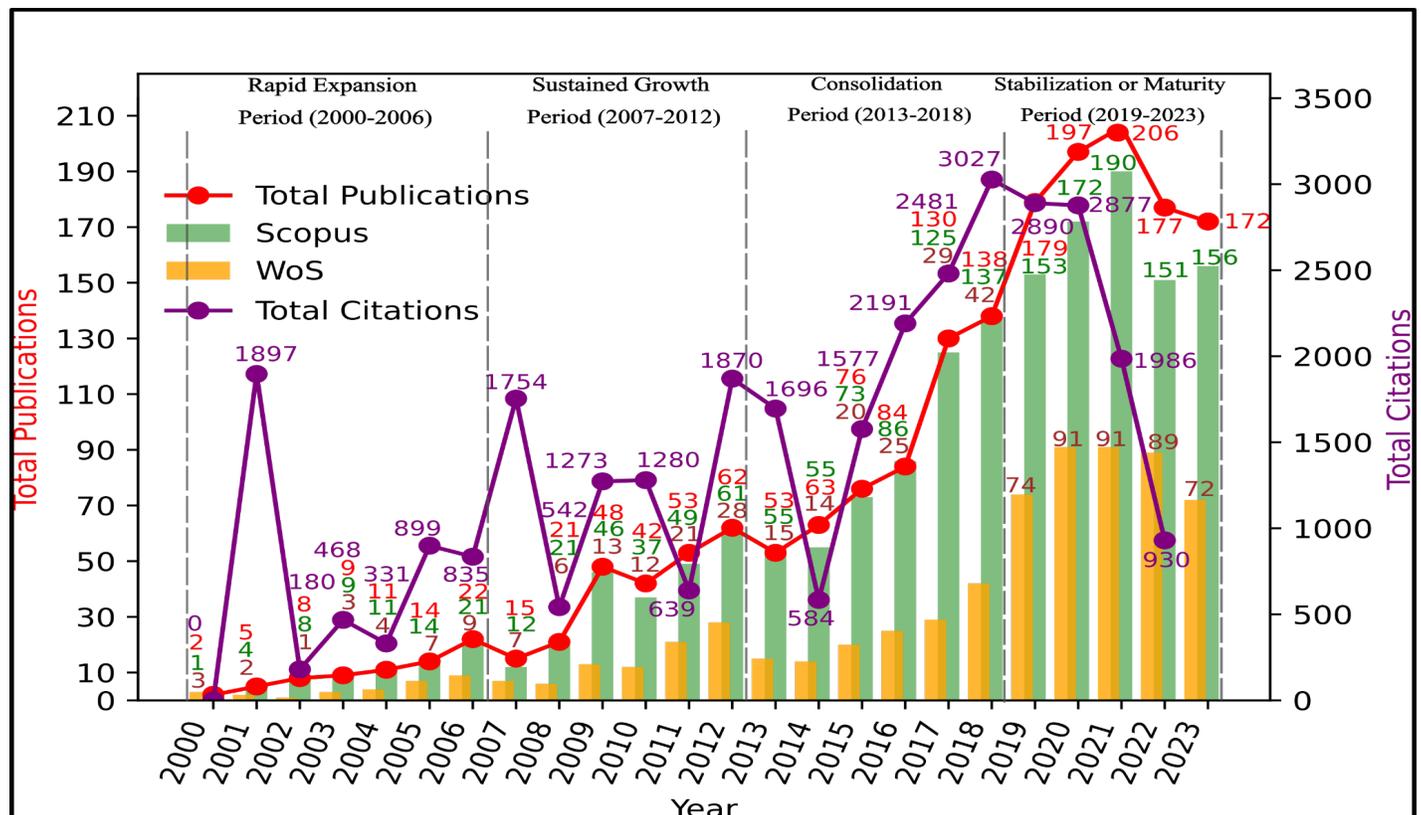
## RESULTS

### Bibliometric Analysis

#### Scientific production

Figure 1 illustrates the annual scientific production from WoS and Scopus individually and in combination (red line); overall, scientific production has increased by 21.37 % over the last twenty-three years, reflecting the significance of IE for the scientific community.

Additionally, it is observable that, in all years, Scopus records more documents than WoS; since 2019, the total exceeds Scopus' count, indicating that WoS contains a significant portion of different academic production, making it essential to conduct Scientometric studies on IE that integrate these two databases (usually such studies are conducted on records from a single database).



**Figure 1.** Annual Evolution of Scientific Production in IE

**Source:** Own elaboration based on data from the WoS and Scopus.

Researchers divided the evolution of scientific production into four periods.

#### Rapid Expansion Period (2000-2006)

The number of papers produced increased significantly, from three in 2000 to twenty-two by 2006 (49.13 %), which affected the production's influence.

Professors Michael Frese and Doris Fay's study on personal initiative and its influence on the notion of work caused a peak in citations, as seen in Figure 1 (Frese & Fay, 2001).

### Sustained Growth Period (2007-2012)

The second period shows a steady increase of 32.89 % in scientific production; this phase begins with 15 articles and concludes with 62.

Additionally, there's a notable peak in the citations received, primarily due to the influential work of Priem et al. (2012), which explores the impact of technology on IE.

### Consolidation Period (2013-2018)

With an annual growth rate of 21.09 %, this period demonstrates a consolidation of the scientific community in IE, a promising aspect of which was the positive slope of citations received, where each year surpasses the previous one, reaching a peak in 2018 with Prassl's (2018) work; this study elucidates the creation of new professions because of developed technologies and indicates that the rise of the gig economy is transforming business models.

### Stabilization or Maturity Period (2019-2023)

This period shows a lower production than previous ones, possibly influenced by the COVID-19 pandemic; nonetheless, the scientific output during this period ranks third and fifth (156 and 151 articles from WoS and Scopus) related to total annual production, which indicates a sustained interest and ongoing research in the IE field despite global challenges.

An increase was achieved in scientific productivity from 2019 to 2023, which also observed a high level of citations and publications in indexed journals.

### Country Analysis

Table 2 displays the top ten countries with the highest production in IE. Researchers created this table based on authors' affiliations from the records generated by combining WoS and Scopus; the USA stands out as the leading country, accounting for 15.94 % of production and a high level of impact (measured in citations received) with 20.86 % of total citations from all countries; publications from the Netherlands are also noteworthy for having 13.09 % of citations despite being few compared to other countries with 3.47 %.

Authors affiliated with the USA have recently published a reference book for entrepreneurs on common practices in technological management (Giannattasio et al., 2023).

**Table 2.** Global Scientific Production and Citation Impact by Country

Country	Production		Citation		Q1	Q2	Q3	Q4
	Articles	%	Citations	%	Articles	%	Articles	%
USA	275	15.94 %	4 677	20.86 %	76	25	18	14
					49.45 %	31.67%	9.42%	9.46%
China	176	10.92 %	831	3.71 %	31	14	20	10
					4.69 %	8.65%	10.47%	14.93%
United Kingdom	85	5.27 %	1 978	8.82 %	23	15	3	2
					8.50 %	19.01 %	1.57 %	2.99 %
Italy	67	4.16 %	1 019	4.55 %	20	9	3	3
					10.14 %	12.32 %	1.57 %	4.48 %
Spain	64	3.97 %	1 127	5.03 %	22	8	7	3
					5.54 %	10.14 %	3.66 %	4.48 %

Germany	63	3.91 %	1 885	8.41 %	16	9	3	0
					3.31 %	11.41 %	1.57 %	0.00 %
Netherlands	56	3.47 %	2 934	13.09 %	23	4	6	0
					8.50 %	5.07 %	3.14 %	0.00 %
Ukraine	54	3.35 %	196	0.87 %	0	0	7	5
					0.00 %	0.00 %	3.66 %	7.46 %
France	48	2.98 %	658	2.94 %	11	4	7	4
					2.79%	5.07%	3.66%	5.97%
India	48	2.98 %	246	1.1 %	3	5	2	12
					2.79%	6.33%	1.05%	17.91%

Source: Own elaboration based on data from the WoS and Scopus.

Figure 2 depicts the scientific collaboration network among countries; this network is noteworthy for being rich in nodes and links, showcasing the interdisciplinary characterizing the scientific community in the IE field.

For instance, there are scientific collaborations involving a variety of countries, like the work of Urbano et al. (2020) investigating whether entrepreneurial activity influences the development of countries, or that of Herhausen et al. (2021) conducting a meta-analysis to re-examine the flexibility of entrepreneurs' strategies. The analysis of nodes and links reveals the scientific community significantly consolidated from 2018 onwards because links surpass nodes in quantity, indicating extensive studies among the same countries.

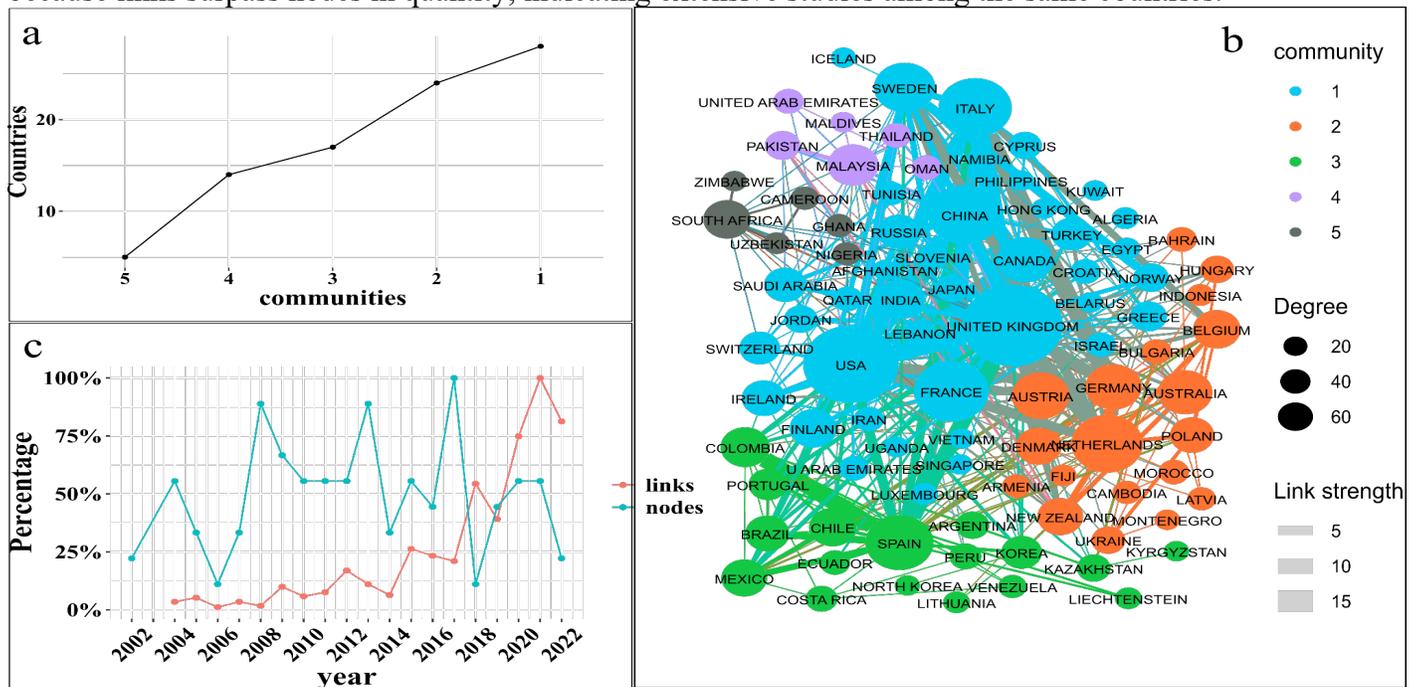


Figure 2: Global Collaboration Network and Community Dynamics in IE. 2a. Total Number of Communities by Size 2b. Nodes and Links Over Time. 2c. Scientific Collaboration Network of Countries.

Source: Own elaboration based on data from the WoS and Scopus.

## Journal Analysis

Table 3 reveals that conferences have played a significant role in academic production on IE, securing the second and third positions in the top ten; it is also crucial to note that most journals are in the highest quartiles (Q1 and Q2).

Small Business Economics stands out as the journal with the highest production in IE in both WoS and Scopus; their publications cover a diverse range of topics, from education (Ahn & Winters, 2023) to public policy development for encouraging entrepreneurship (Wang et al., 2022).

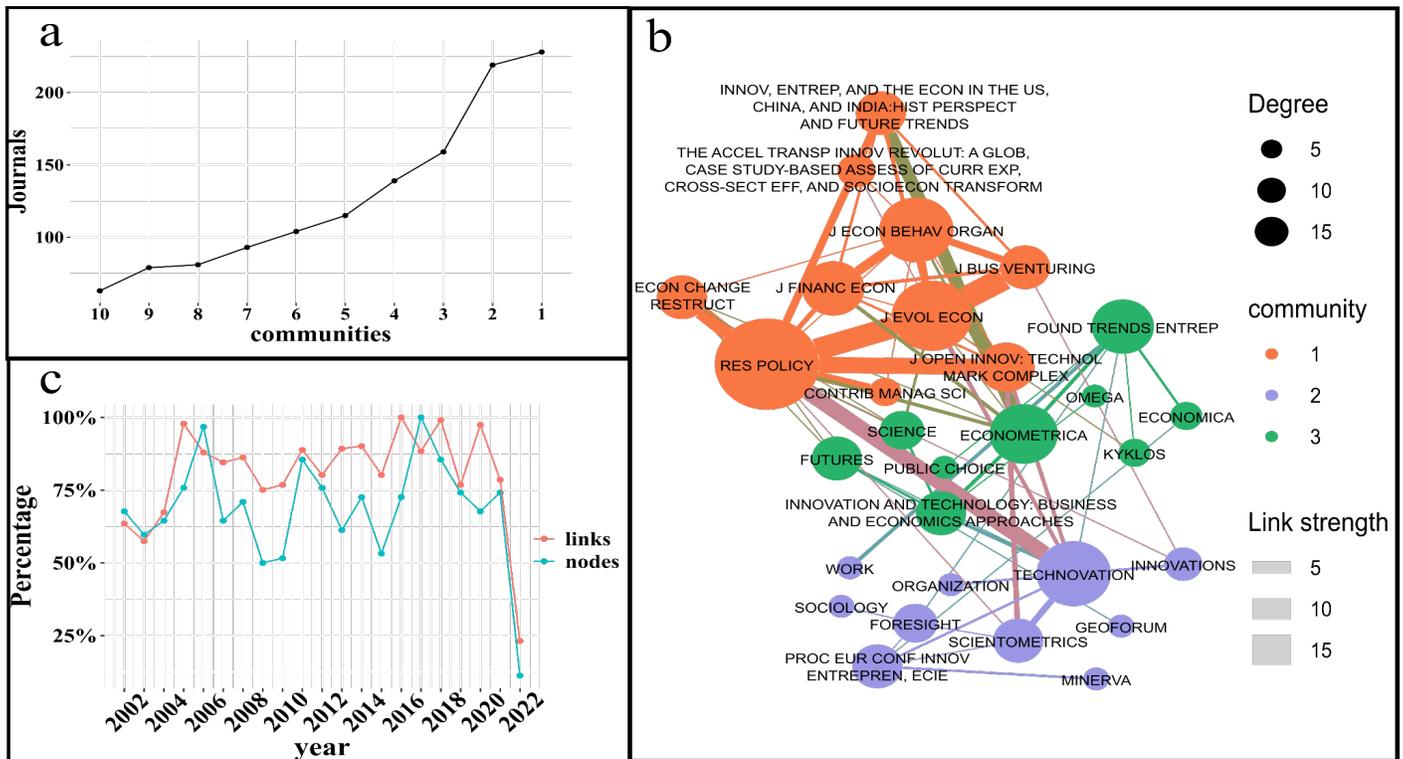
On the other hand, the Journal Of Business Research holds the highest h-index and has published various topics on IE, ranging from research in emerging markets (Gu, 2023) to the impact of technology on IE (Huang & Yu, 2022).

**Table 3.** Journal Impact and Influence on IE

Journal	WoS	Scopus	Impact Factor	H Index	Quantile
Small Business Economics	24	23	2.73	157	Q1
Asee Annual Conference And Exposition, Conference Proceedings	0	26	0	39	-
Proceedings Of The European Conference On Innovation And Entrepreneurship, Ecie	0	25	0	7	-
Sustainability (Switzerland)	0	19	0.66	136	Q1
Academy Of Entrepreneurship Journal	0	16	0	19	-
Acm International Conference Proceeding Series	0	15	0.21	37	-
Journal Of Business Research	15	15	2.9	236	Q1
Frontiers In Psychology	13	13	0.89	157	Q2
International Studies In Entrepreneurship	0	15	-	-	-
Management Decision	9	12	1.35	116	Q1

**Source:** Own elaboration based on data from the WoS and Scopus

The citation network helps identify themes among groups of journals, Figure 3 displays the three largest groups; the journal "Research Policy" leads the first group and focuses on governmental policy themes for strengthening entrepreneurship (Buffart et al., 2020; Gifford et al., 2021); the second group leans toward the impact of technological development on IE (Dabić et al., 2021); the third group (green) prioritizes innovation processes in entrepreneurship (Elert & Henrekson, 2021).



**Figure 3:** Global Network of Collaboration and Dynamics of Journals Over Time in IE. 3a. Total Number of Communities by Size. 3b. Nodes and Connections Over Time. 3c. Scientific Collaboration Network among Journals.

**Source:** Own elaboration based on data from the WoS and Scopus

### Author Collaboration Network

Table 4 presents the most prolific researchers in the field of IE. Magnus Henrekson has the highest productivity and has focused on entrepreneurs' significance in the economy, as referenced in his publications (Elert & Henrekson, 2022; Henrekson & Stenkula, 2022); Dr. Maureen McKelvey holds the highest h-index (24), with her research primarily aimed at unraveling the factors influencing the innovativeness of entrepreneurial ventures (Gifford et al., 2021; Zaring et al., 2021).

No	Researcher	Total Articles*	Scopus h-index	Affiliation
1	Henrekson, M.	12	32	Research Institute of Industrial Economics, Stockholm, Sweden
2	Baumol, W.	11	31	New York University, New York, United States
3	Zhang, Y.	11	1	Jusup Balasagyn Kyrgyz National University, Bishkek, Kyrgyzstan
4	Audretsch, D.	8	95	Indiana University Bloomington, Bloomington, United States
5	Lee, C.	8	13	University Of South Australia, Adelaide, Australia
6	Mckelvey, M.	7	24	Göteborgs Universitet, Gothenburg, Sweden
7	Urbano, D.	7	46	Universitat Autònoma De Barcelona, Cerdanyola Del Valles, Spain
8	Wang, H.	7	6	Harbin University Of Science And Technology, Harbin, China

9	Wang, M.	7	1	Hubei Business College, Wuhan, China
10	Elenurm, T.	6	8	Estonian Business School, Tallinn, Estonia

The most productive authors come from diverse origins, including the United States, Australia, Switzerland, Spain, China, and Estonia.

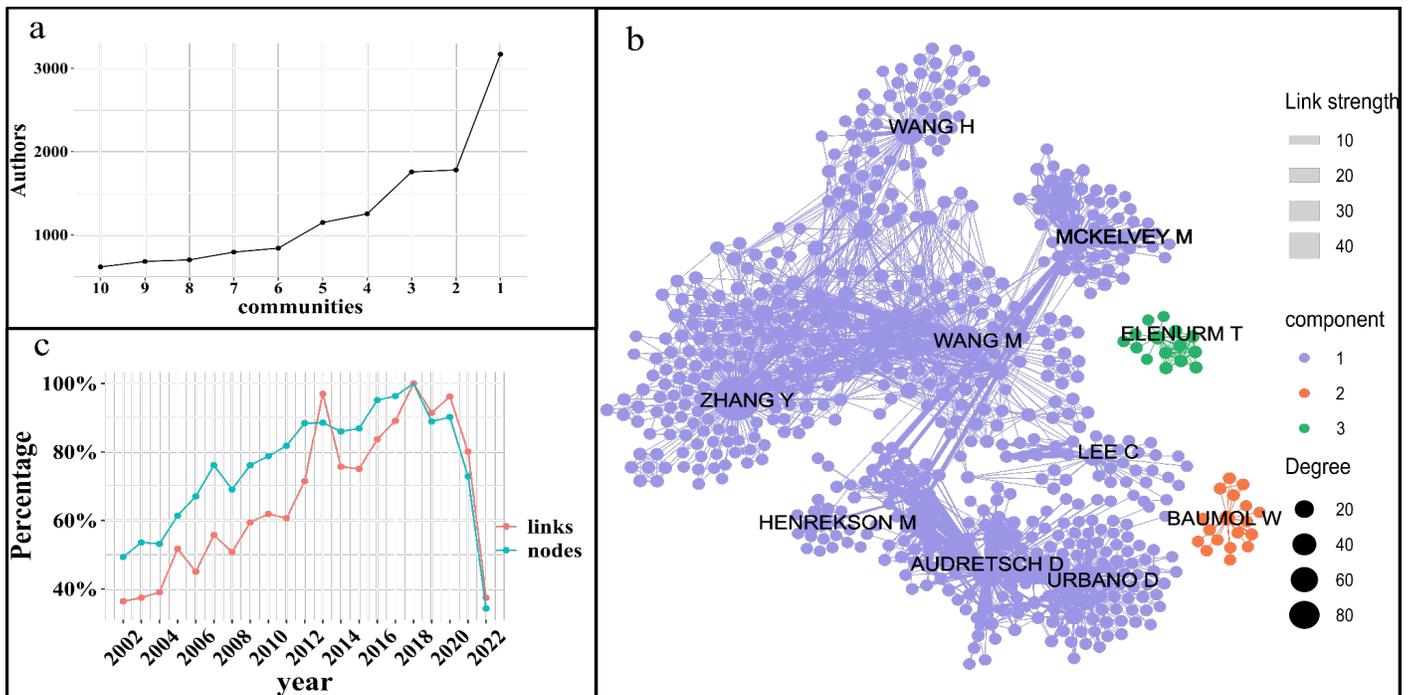
**Table 4.** Leading Contributors to IE Research

**Source:** Own elaboration based on data from the WoS and Scopus

The scientific collaboration network illustrates connections established by authors through article creation, reflecting their networking capabilities (Robledo et al., 2022) Figure 4 demonstrates that the collaboration network in IE comprises three components, with the first (purple) being more significant than the other two; within this component, researchers identified a group consisting of professors Magnus Henrekson, David Urbano, and David Audretsch, who focus on institutional roles in their research (Urbano et al., 2020); however, only Dr. Urbano and Audretsch have collaborated.

This pattern appears also with Dr. Wang, Zhang, and McKelvey; although they do not have collaborations, they have authors who connect them, forming the network visualized in Figure 4.

Additionally, nodes and link mapping over time shows that the ratio of links versus nodes (authors) was exceeded in 2016, indicating that relationships through scientific works have significantly intensified.



**Figure 4:** Global Network of Collaboration and Dynamics of Authors Over Time in IE. 4a. Total Number of Communities by Size. 4b. Nodes and Connections Over Time. 4c. Scientific Collaboration Network by Authors.

**Source:** Own elaboration based on data from the WoS and Scopus.

## Tree of Science

### Root

Several seminal works form the foundation of IE as a field of study; foremost among these is a contribution by Schumpeter & Swedberg (2021), who posited that entrepreneurs, particularly innovative ones, play a significant role in economic development, they regarded entrepreneurs as pivotal agents around whom innovation revolves.

In his theory, Schumpeter (1976) argued that entrepreneurs capitalize on scientific and technological advancements to create new investment opportunities, fostering growth and employment; he also defined entrepreneurship as introducing new products using technologies and innovations that bring about economic shifts.

Generally, he attributed a central role to the innovative entrepreneur in economic development and technological progress.

Another significant contribution is that of Kirzner (1978), who offered a critique of positivist price theory and microeconomics; he expanded upon the views of Mises and Hayek regarding entrepreneurship and competition, framing them as processes driven by human action and alertness to profit opportunities.

Kirzner conceptualized the entrepreneur as the agent who eliminates disequilibrium, coordinating knowledge and actions within the market; even if he did not explicitly focus on developing the concept of IE, his insights have been fundamental and are cited frequently by scholars in the field.

In the 1990s, other contributions emerged that have been highly significant in propelling IE as a prominent field of study, earning recognition from the scientific community through numerous citations.

Baumol (1990) accentuated the multifaceted nature of entrepreneurship, categorizing it as productive, unproductive, or destructive; this classification hinges on the extent to which entrepreneurial activities contribute to areas such as innovation.

Notably, Baumol underscored that productive entrepreneurship stands out as it engenders innovations that most substantially benefit the economy, thereby highlighting IE's critical role in driving economic growth and development.

Moreover, drawing insights from Lumpkin & Dess (1996) and Wennekers and Thurik (1999), their research concluded that entrepreneurship and innovation can form a symbiotic relationship, propelling economic growth; this relationship develops through the generation of new ideas, experimentation, and creative processes, coupled with the strategic use of existing knowledge.

Such a dynamic interaction has the potential to yield novel products, services, or technological processes; this interplay between entrepreneurship and innovation underscores a fascinating aspect of economic development, highlighting the transformative power of combining entrepreneurial spirit with innovative thinking to foster progress and prosperity.

### Trunk

The ToS algorithm identifies in the trunk those references that have been foundational in supporting the field's development, upon which different branches emerged in the shape of current trends; various contributions allow us to understand the field's development from this core component, which has entailed a reevaluation of the context surrounding the creation of new businesses, the differentiation between innovative and imitative enterprises, creation of value, and the study of IE in specific contexts such as higher education or emerging economies.

Samuelsson & Davidsson (2009) investigated how the process of establishing innovative businesses differs

from that of imitative ones, with innovators being those that introduce a significant novelty into the market; through the analysis of hundreds of entrepreneurial endeavors in Sweden, they revealed that education level, prior experience in business creation, and instrumental social capital have a positive and more powerful effect on innovative enterprises than on imitative ones.

Similarly, Cliff et al. (2006) explored the differences between these types of enterprises in terms of founders' experiences, beliefs, and motivations; they found that entrepreneurs of imitative enterprises tend to have a more pragmatic and adaptive view of the business environment, while those of innovative enterprises tend to have a more critical and transformative perspective, differences that relate to their backgrounds, networks, resources, and personal values.

These studies help us recognize the significance of researching entrepreneurial behavior, like Dyer et al. (2008), who utilized a grounded theory approach to identify four patterns of behavior that increase the likelihood of generating ideas for innovative businesses: questioning, observing, experimenting, and establishing idea networks; the study also suggests that innovative entrepreneurs are more unsusceptible to the status quo and are motivated to change it, behaviors teachable through education: Mayhew et al. (2012) examined the relationship between IE and higher education experiences through a study involving 3700 university students; the research findings suggest that some university experiences, such as participation in entrepreneurship programs and exposure to entrepreneurial role models, can positively influence students' innovative entrepreneurial behaviors.

Work from alternative perspectives has also played a pivotal role in consolidating the field of study; for instance, the scientific community has esteemed the contributions of Acs et al. (2013), who delved into the realms of productive, unproductive, and destructive entrepreneurship in terms of social value creation; in particular, drawing insights from various real-world cases, they examined how social entrepreneurship contributes to the creation of value, encompassing both economic and social dimensions.

Similarly, Marcotte (2014) scrutinized the relationship between entrepreneurship and innovation within the economies of sixteen emerging countries through the lenses of Schumpeter and Kirzner; their research uncovered four distinct entrepreneurship profiles, shedding light on certain variables more conducive to fostering IE.

### **Branch 1: Strategic Entrepreneurship, Digital Transformation, and Higher Education**

Currently, research in entrepreneurship and innovation has focused on topics such as education and digital transformation, also studied in this area; according to Al-Tarawneh et al. (2024), business organizations have shown interest in researching entrepreneurship and innovation to identify aspects that can impact the performance of companies, especially by increasingly evaluating the management system; likewise, the implementation of a business strategy, the support of social capital, and innovative business techniques have resulted in the creation of a sustainable management system and the overall improvement of companies' performance.

Furthermore, the innovative application of business strategies and the creation of social capital also help promote sustainable management that contributes to developing and improving business processes and results.

From the perspective of entrepreneurship in resilient situations, Yadav et al. (2023) explore the challenges and opportunities faced by small businesses operating in the craft industry, focusing on new artisan entrepreneurs in the post-COVID-19 pandemic era; they discuss the theoretical, policy, and managerial implications of their research, as well as their limitations and directions for future studies; they suggest that the government should

support the craft sector by providing technical, financial, marketing, and legal resources, while entrepreneurs should enhance their technological, financial, and sales skills.

Qasim et al. (2023) conducted a systematic literature review on e-entrepreneurship, defined as using electronic platforms to create innovative businesses in the Net Economy; they highlight some relevant findings for professionals, advisors, and policymakers, such as the potential of e-entrepreneurship to generate opportunities and employment, especially for young people, and the factors affecting the success and sustainability of online businesses.

As Al Qatiti et al. (2023) demonstrated in their example, the globalization of education, intricate ranking systems, and budgetary constraints provide significant obstacles for higher education institutions; despite these obstacles, the government, the corporate sector, and the alumni community want HEIs to provide employability, innovation, entrepreneurship, research, and social responsibility.

In a different context, Alalwan et al. (2023) explain two key elements driving entrepreneurial financial alertness: entrepreneurial orientation and marketing orientation; they develop and analyze a conceptual model based on Kirzner's entrepreneurial alertness theory; they also establish a theoretical framework that highlights the importance of two vital components for improving entrepreneurial financial awareness: entrepreneurial orientation and marketing orientation, based on Kirzner's notion of entrepreneurial alertness.

Their results provide compelling evidence of the positive effects of finance-driven digital transformation on creative enterprise finance and SME performance, along with the influence of entrepreneurial financial awareness on the latter; these findings, which address critical aspects of enterprise digital transformation, are an increasingly urgent issue with significant implications for academics and practitioners in the field of finance-based digital transformation.

## **Branch 2: Technology as a Keystone in Entrepreneurial Innovation Ecosystems**

Technology's impact on IE is critical for success, as suggested in branch 2; in this context, Cuéllar et al. (2024) establish that the ability to assimilate and apply information is a critical component in the technological management of IE. This finding is important because it suggests that IE's use of technology to foster innovation and knowledge capitalization is inextricably linked.

Entrepreneurs face a problem concerning technological improvements and their incorporation inside IE. In keeping with this, Wihlborg & Iacobaeus (2023) emphasize the challenges of digital inclusion; likewise, Abramova et al. (2023) examine perspectives on digital platforms in the context of regulations meant to promote their effective implementation for IE. Additionally, Basdekidou & Papapanagos (2023) validate that technological development influences the performance of innovative entrepreneurial ventures.

In conclusion, these investigations elucidate that technology is an indispensable factor in IE, albeit its implementation presents challenges.

Despite the hurdles and challenges entailed by technology in IE, its substantial benefits in enhancing internal processes and cultivating competitive advantages are proven (Boutillier & Uzunidis, 2020); at a macro level, technology has contributed to socioeconomic growth while preserving a digital divide between affluent and impoverished nations, necessitating further research for resolution on the subject.

Easwaran (2022) defines the chasm between wealthy and less privileged nations in terms of access and use of technology, implying that the accessibility of technology for IE has been pivotal in fostering socioeconomic growth.

The concept of technology has gained prominence in recent times and has progressively evolved into a pivotal

element for sustainable IEs; Boutillier et al. (2021) exemplifies this perspective, endorsing this viewpoint by drawing upon Schumpeter's ideas on Entrepreneurship and Innovation; they emphasize that the concept of innovation has transformed in recent years, progressively orienting itself toward technological developments.

### **Branch 3: Public Policy and Innovation Dynamics in Entrepreneurial Development**

This area of study identifies a trend in IE that centers on the recommendation of governmental initiatives to support the growth of entrepreneurship and different aspects of its promotion; in their analysis of various facets of contemporary innovation policy, Svitlychnyy et al. (2023) suggest that modernizing businesses, attracting investment aggressively through involvement in both domestic and international projects, integrating information technologies into the production domain, and effective management strategies targeted at our state's participation in global innovation processes should be the foundation of such policy; they analyze the importance of state innovation policy tools, initiatives, and difficulties for national and regional level action and provide suggestions for improving their efficacy; they also stress the significance of collaboration between academic and scientific establishments.

López-Muñoz et al. (2023) investigate the personal factors influencing the behavior of innovative entrepreneurs, explaining that factors such as technology play a determining and significant role in shaping entrepreneurial behavior.

Similarly, Crnogaj & Rus (2023) present trends and opportunities for development in the contemporary business environment where startups are crucial in job creation, especially in mature business ecosystems like the United States; however, the text highlights that Europe, especially Slovenia, represents an untapped opportunity in this regard.

This study aims to understand the dynamics affecting startups during their transition to scale-ups as they face various challenges; notably, for a successful transition from a startup to a scale-up, companies must harness their innovative capabilities by identifying and providing information about the unique challenges and opportunities in the region; ultimately, findings advocate for a holistic approach to the startup ecosystem, emphasizing the importance of a multifaceted support system for these evolving enterprises.

Uriarte et al. (2023) contributed by studying the role of the hybrid entrepreneur, individuals characterized for being both entrepreneurs and employees, recognizing innovative opportunities through entrepreneurial learning.

Enterprises are vulnerable to risks that might hinder their growth, particularly during international conflicts. Hryshchenko et al. (2023) examined the features and components of IE inside integrated structures in their research, which can use beneficial synergistic effects for increased success; their findings highlight the potential benefits and drawbacks of integrated structures in innovative endeavors, along with the dangers and possibilities they can encounter in the aftermath of the conflict; the authors offer a SWOT-based strategic planning matrix and offer potentially controllable spheres of influence inside the functional context of integrated structures.

## **DISCUSSION**

This article presents a bibliometric analysis of IE to identify its intellectual structure and research trends; some of the potential outcomes of this study are as follows:

Firstly, there is an emphasis on a constantly growing body of scientific literature; the analysis reveals a sustained increase in IE-related research production over the last 23 years.

This growth demonstrates significant diversity in countries, journals, authors, and collaboration networks that contribute to developing and understanding this field of study.

Regarding the intellectual structure of the field, the article employs the ToS algorithm to discern foundational, structural, and emerging works that have influenced the development of innovative entrepreneurship; this approach allows for a visualization of the evolution and interconnections within the domain, providing valuable insights for researchers and practitioners.

Furthermore, researchers identified three main emerging research areas in IE; firstly, they highlighted the significance of strategic entrepreneurship, digital transformation, and higher education; secondly, they addressed the fundamental role of technology in IE's ecosystems; and finally, they explored the intersection between public policy and innovation dynamics in business development.

These emerging trends indicate promising directions for future research and offer a comprehensive view of IE's current landscape.

### **CONCLUSION**

The study underscores that innovative entrepreneurship is critical to addressing current and future global challenges; in an increasingly interconnected and ever-changing world, companies and entrepreneurs that adopt innovative approaches can generate creative and sustainable solutions to complex problems such as climate change; for example, innovative companies can develop clean and efficient technologies that reduce carbon emissions and promote the transition to a low-carbon economy.

In addition, innovative entrepreneurship can play a crucial role in reducing economic inequality by fostering job creation and economic opportunity in disadvantaged communities; by driving innovation in sectors such as education and health, companies can improve people's quality of life and contribute to sustainable human development.

In terms of digital transformation, innovative entrepreneurship is essential to make the most of the opportunities offered by digitization; innovative entrepreneurship can develop disruptive technological solutions that improve companies' efficiency, productivity, and competitiveness, enabling them to adapt and thrive in a constantly evolving business environment.

In short, innovative entrepreneurship drives economic growth and business competitiveness and can be a key driver in addressing our society's most pressing challenges; by fostering an enabling environment for innovation and entrepreneurship, governments, businesses, and society as a whole can work together to build a more sustainable and inclusive future for all.

### **Conflict of Interest Statement**

The authors of this article state that the information in the document does not affect any of the companies that collaborated with the information.

Researchers gave each explanation because of hermeneutic synthesis; therefore, they are responsible for each assertion.

### **Authors' Contribution**

The authors of this document report that they were solely responsible for conducting the research, from its design to the writing and structuring of the current article.

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