Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

INNOVATION AND RESEARCH FOR SUSTAINABILITY

MASTER´S FINAL WORK

DISSERTATION

MAPPING THE CONCEPTUAL STRUCTURE OF THE ENTREPRENEURSHIP LITERATURE – A BIBLIOMETRIC STUDY OF TRENDS AND DEVELOPMENTS OVER 75 YEARS

LUKA VOGEL

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FEBRUARY 2025

GLOSSARY

AAGR – Average Annual Growth Rate

C/Y – Citations per Year

H0 – Null Hypothesis

H1 – Alternative Hypothesis

NP – Number of Publications

PRISMA – Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SDGs – Sustainable Development Goals

SLR – Systematic Literature Review

TC – Total Citations

WoS – Web of Science

ABSTRACT, KEYWORDS, AND JEL CODES

Entrepreneurship research has grown into a large and multidisciplinary field, evolving over decades to address various subtopics, drawing on contributions from management, economics, social sciences, and other disciplines. The purpose of this study is to explore the developments and trends of the whole academic field of entrepreneurship by using a bibliometric analysis. Based on a combined dataset from the Web of Science and Scopus, we identified more than 200,000 documents to analyze 75 years of entrepreneurship research from a broad perspective. We conducted a performance analysis capturing the main statistical characteristics of influential papers, authors, institutions, and countries, as well as publication trends over time. Further, research topics and development trends are revealed through keyword analysis, bigram and trigram analysis. By employing co-occurrence analysis as a semantic mapping technique, this study reveals the key themes of entrepreneurship research and their thematic evolution. Major recent trends in the entrepreneurship literature were found and studied in more detail, to understand their origin and dissemination, include Social Entrepreneurship, Sustainable Entrepreneurship, International Entrepreneurship, Entrepreneurship and Family Firms, and Entrepreneurship and High-Tech Industry. For each trend, a take-off analysis of the keyword's growth curve is identified, and the growth is analyzed. The findings contribute to a broader understanding of the field's conceptual structure and offer guidance for future research directions within entrepreneurship.

KEYWORDS: Entrepreneurship; entrepreneurship literature; entrepreneurship research; bibliometric analysis; performance analysis; keyword analysis; keyword co-occurrence analysis; thematic mapping analysis

JEL CODES: L20; L25; L26; M13; M14; M16

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Lastly, I am profoundly grateful to my family and friends for their constant support and encouragement. Their belief in me has been a source of strength and motivation. This dissertation would not have been possible without them.

DISCLAIMER

During this research, I used *ChatGPT* as a supporting tool for specific data analysis and text refinement tasks. It was particularly helpful as an assistant in optimizing queries and modifying code from official manuals or related papers to suit my data set and analysis needs in *R Studio* and *Python* as well as plotting results (take-off analysis). By streamlining the coding process, *ChatGPT* contributed to a more efficient workflow and increased my hands-on experience with the software needed, therefore adding positive value to my work. In addition, I used it in the final stages of text editing to reduce the volume of text, while maintaining clarity and coherence. While the AI tool provided valuable assistance in these aspects, all critical analysis, interpretation, write-ups, and final decisions remain my own.

1. INTRODUCTION

The number of publications in the field of entrepreneurship[1] has been constantly growing throughout the last decades with an exponential increase in publications during the last few years. Unlike fields with more rigid disciplinary boundaries, entrepreneurship is inherently multidisciplinary, highly comlex, and heterogeneous (Bruyat and Julien, 2001). Following the definition Bruyat and Julien published in their article "*Defining the field of Research in Entrepreneurship"* from 2001, rather than limiting our scope to business venturing only, this study adopts a broad perspective - one that includes diverse contributions from management, economics, social sciences, and other disciplines including the enterprise, the individual, as well as surrounding aspects influencing the two. Shane and Venkataraman (2000) define the field of entrepreneurship as "the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited" (p. 218). While Shane and Venkantaraman follow an individual-opportunity-centric approach, Welter (2011) emphasizes the importance of context in understanding entrepreneurship. Entrepreneurship can therefore be understood as the process by which an individual or group of individuals identify, evaluate, and exploit opportunities to create value (Shane & Venkataraman, 2000), influenced and by several contextual dimensions, such as social, institutional, spatial, and business environment (Welter, 2011). This combined definition reflects the heterogeneity and variety in the field, calling for more research about the development of the field, making a comprehensive bibliometric analysis essential to understanding the composition and conceptual evolution of this multidisciplinary research field as it has unfolded over the past 75 years. Several analyses have been published. Yet a study of the conceptual structure of the entire field does not exist and only a fragmented understanding is known about how the entrepreneurship research has evolved. There's a lack of quantitative, bibliometric studies that focus on the entire field of entrepreneurship in a broader sense (1st gap) over a long period (2nd gap), incorporating all important publications about entrepreneurship (3rd gap), comparing developments and trends in entrepreneurship research (4th gap) across different article types (5th gap), and

[1] Given the ongoing debate about entrepreneurship as a discipline (Farber Canziani and Welsh, 2021; Harrison, 2023; McMullen, 2019; Shane and Venkataraman, 2000; Urban, 2010; Wood, 2020), it's definition as a multidisciplinary field seems most appropriate.

different disciplines contributing to the field (6th). Previous research on how the field has developed provides insights to part of the literature but has mostly focused on subtopics such as social entrepreneurship, entrepreneurial organizations, or ethics in entrepreneurship further addressed in the literature section of this study. Besides, they dealt with narrow sets of analysis (on average 1,500 documents) and usually only considered one database, either Web of Science or Scopus (7th gap). This paper aims to provide a thorough analysis of the entire entrepreneurship literature to contribute to a comprehensive understanding of the conceptual structure and the thematic development of the field. It, therefore, consolidates and analyses 75 years[2] of entrepreneurship literature published in the two databases WoS and Scopus to find out how different subtopics have evolved, stayed, and disappeared, and which trends have emerged during the past few years.

The present study identifies present key themes within entrepreneurship literature and evaluates how the field has evolved. We therefore study the most relevant keywords and carry out a co-occurrence analysis of keywords found in all studies on Entrepreneurship published between 1950 and 2025 retrieved from WoS and Scopus. These two databases have been the most widely used in bibliometric research providing access to a comprehensive collection of peer-reviewed journals. In addition, we identify stable as well as short-term trends in the fields and examine how they have emerged through a take-off analysis. Finally, based on our results we critically discuss the heterogeneity in the discipline's definitions, used research methodologies, theoretical foundations, and unit of analysis. With this work and understanding of the field's development over the past 75 years, we contribute also to the discussion of the discipline's strengths, and weaknesses and deliver some ideas for future research.

[2] Even though the full dataset covers all publications from 1906-2025, most analyses were carried out considering 1950-2025 due to data availability thresholds.

The subsequent sections of this paper are structured as follows: Section 2 provides a brief, necessarily concise qualitative overview of the entrepreneurship literature. Section 3 outlines the bibliometric methodologies employed. Section 4 elaborates on the data sources utilized for bibliometric analysis. Section 5 provides an overview of the findings from three distinct analyses, which include basic statistical characteristics, keyword, keyword co-occurrence, thematic mapping, thematic evolution, and take-off analysis of recent trends. In section 6 we present our conclusions. Lastly, in Section 7 we address the limitations of this study.[3]

[3] In accordance to the thesis' supervisors we strechted the size and word count limit slightly to include several figures and tables that needed to be presented in an appropriate size. In addition to the Appendix included in this dissertation, we provide an Online Appendix, including detailed documentation, additional material and analyses.

Click to open Luka_Vogel_Online_Appendix.pdf and Luka_Vogel_Online_Appendix.xlsx

2. LITERATURE ON ENTREPRENEURSHIP

From a historical point of view, entrepreneurship has been defined by various scholars, shaping the field of entrepreneurship research. Richard Cantillon (1680 – 1734) was the first to recognize the entrepreneur as a driver of economic change. Unlike employees or landowners, entrepreneurs engage in arbitrage, facing uncertainty and risk in pursuit of profit (Cantillon, 1755; Hébert and Link, 2006; Murphy et al. 2006). Jean-Baptiste Say (1767 – 1832) later emphasized the entrepreneur's managerial and coordinating role in production and distribution, portraying them as specialized laborers earning wages for these skills (Hébert and Link, 2006; Say, 1803). The neo-classical economist Alfred Marshall (1842-1924) saw entrepreneurs as innovators striving to minimize production costs while leading firms (Groenewegen, 1995; Marshall, 1890; Mirjam Van Praag, 1999).

One of the researchers tightly associated with the term entrepreneurship is Joseph Schumpeter (1883-1950), who contributed significantly to today's understanding of entrepreneurship. He challenged the traditional views of the entrepreneur as a risk-taker or business manager. In his book *The Theory of Economic Development*, published in 1911 (McCraw, 2007; Schumpeter, 1934), he first introduced the concept of creative destruction as the main component of entrepreneurship. According to Schumpeter the entrepreneur is an innovator who revolutionizes existing structures by introducing new products, new forms of production, new processes, new forms of organization, or new markets. Entrepreneurship is a temporary condition that lasts as long as the entrepreneur continues to innovate (Croitoru, 2012). Frank Knight (1885 – 1972) incorporates Cantillon's theory of entrepreneurship in his theory. In his dissertation *Risk, Uncertainty and Profit*, published in 1921, he reemphasizes the aspects of risk and uncertainty and the importance of control (Knight, 1921). According to Knight, entrepreneurship involves making judgment-based decisions in uncertain conditions to secure the operating state of an innovating business (Foss and Klein, 2015). In his publication *Competition and Entrepreneurship* from 1973, Kirnzer highlights the entrepreneur's role as someone identifying and exploiting opportunities in the market (Kirnzer, 1973). Unlike Schumpeter's disruptive innovator, Kirnzer's entrepreneur doesn't have to create new markets but discover inefficiencies and perceive them as profit opportunities. Arguing

that the economy is in a constant state of disequilibrium, unlike neo-classical economists understanding, the entrepreneur moves the economy toward equilibrium by exploiting market opportunities. Kirnzers definition of entrepreneurship solely focuses on opportunity identification (Ekelund and Kirzner, 1974). Peter Drucker (1985) further elaborates on the systematic process of innovation and entrepreneurial behavior. Like Kirnzer, he highlights opportunities as the sources of innovation and entrepreneurship (Alum and Drucker, 1986).

Despite differing perspectives – the entrepreneur as a risk-bearer (Cantillon), manager (Say), innovator (Schumpeter), judgment-based decision-maker (Knight), or opportunity exploiter (Kirzner and Drucker) – classical theories collectively define the entrepreneur as a catalyst of economic change. Three recurring themes emerge: uncertainty and risk, managerial competence, and creative opportunism (Long, 1983).

From a today's point of view, entrepreneurship is a field of research that has been shaped by a wide range of disciplinary perspectives. Economists have examined entrepreneurship through the lens of market dynamics and innovation (Schumpeter, 1934); finance scholars have explored its role in investment, risk, and capital formation; psychologists have explored entrepreneurial traits, behavior, and decision-making under uncertainty; while management and strategy research has focused on new venture creation, innovation, and competitive advantage. In recent years, a broader range of disciplines, including neuroscience, law, education, and philosophy, has enriched the study of entrepreneurship, contributing to shaping entrepreneurship into a distinctly multidisciplinary research domain (Turcan and Fraser, 2018).

Entrepreneurship has evolved into a unique academic field with a variety of definitions, theoretical frameworks, research methods and unit of analysis from numerous perspectives. However, this diversity has also led to inconsistency and fragmentation, making it difficult to find consense in defining entrepreneurship (Shane and Venkataraman, 2000). Early conceptualizations focus on individual traits and economic functions of the entrepreneur. (McClelland, 1961) emphasizes the entrepreneur's drive for success. (Schumpeter, 1934) established the innovator entrepreneur who initiates "creative destruction" while (Kirzner, 1973) sees the entrepreneur as artitrageur taking advantage of opportunity exploitation in disequilibrium.

More recent definitions adopted a more dynamic and process-focused perspective on entrepreneurship. (Shane and Venkataraman, 2000) focus on opportunity recognition and exploitation. This opportunity-centric view has been criticized for not incorporating fundamental institutional and contextual aspects (Welter, 2011). The Journal of Business Venturing and Entrepreneurship Theory and Practice have become a platform for further definitions and discussion. In his publication *"Who Is an Entrepreneur?" Is the Wrong Question* (Gartner, 1988) argues that entrepreneurship should be characterized by what entrepreneurs do, focusing on the creation of new organizations.

As a result of the heterogeneity in entrepreneurship definitions several research streams have emerged focusing on different aspects of entrepreneurial activity. Influenced by (Shane and Venkataraman, 2000) one research stream focuses on opportunity recognition and exploitation, studying how people identify, assess, and take advantage of business possibilities. Closesly related is the research on entrepreneurial psychology that explores how emotions and cognition influence entrepreneurial decision-making (Baron, 2007). Contrary to emphasizing the individual, institutional and contextual approaches focus on how institutions, norms, and sociocultural elements affect entrepreneurial behaviour and success (Aldrich and Ruef, 2006). Process and behavioural approaches see entrepreneurship as a multi-step process including opportunity identification, resource mobilization, and venture creation (Gartner, 1988). Another research stream focuses on corporate and strategic entrepreneurship, examining how well established businesses engage in entrepreneurial activities to boost innovation within the company (Ireland et al., 2001). Other scholars investigate on social and institutional entrepreneurship and companies that aim to provide social value or introducing institutional change (Mair and Martí, 2006). Existing studies examine subtopics such as Identity in Entrepreneurship (Mmbaga et al., 2020), Social Entrepreneurship (Hota, 2023), Ethics and Entrepreneurship (Vallaster et al., 2019) among others.[4]

In sum, the development of the discipline of entrepreneurship over time has let into a critical perception of the discipline itself with specific strengths and weaknesses (Dey et al., 2022). On the strenghts' side, some scholars emphasize the contribution of various disciplines such as sociology, psychology, economics, political science, management, or

[4] For an overview of relevant studies, see Online Appendix O-2.

finance to the field. This richness allows an interdisciplinary research and robust analysis of complex phenomena such as innovation, risk, or value creation (Zahra and Wright, 2011). On the weaknesses' side, this fragmentation prohibits a cumulative knowledge development leading to conceptual ambiquity and no universal agreement (Busenitz et al., 2003). This discussion has however also lead into a perception that entrepreneurship can positively leverage and enhance external theories (Ireland and Webb, 2007), while borrowing frameworks weakens internal coherence and legitimacy (Cornelissen and Clarke, 2010). Futher, Welter et al. (2017) argue that the dominant "opportunity" paradigm used by Shane and Venkataraman (2000) offers a consistent perspective for research studies, but also excludes marginal or necessity-driven forms of entrepreneurship (Zahra, 2007). In addition, while being methodologically open encouraging innovation and qualitative richness, the methodological rigor in entrepreneurship is critized as of shortcomings to proof complex causal mechanisms (McMullen and Dimov, 2013). Finally, entrepreneurship research often neglects the historical evolution of the field and its concepts, weakening its theoretical maturity. As such, recent work calls for historically grounded theorizing, but also warns to not be purely reactive and trend-driven (Wadhwani and Jones, 2014).

Following the importance of analyzing historical data to follow intellectual pathways in entrepreneurship research and put thematic development into context (Wadhwani and Jones, 2014), and to understand the emergence of both definitions and themes into a chronological order, we perform a bibliometric analysis. As no study has yet comprehensively mapped the conceptual structure and evolution of the entire academic field of entrepreneurship from a broad, multidisciplinary perspective, we aim to gain insights into the development of the field, short-term and persistent trends, unanswered questions in literature, and gain a broader understanding of the differentiation of subtopics of the multidisciplinary and heterogeneous field.

3. METHODOLOGY

3.1. Bibliometric Analysis

Since to this day, more than 200,000 documents have been published contributing to the field, it is important to systematize the knowledge to unveil patterns in research. Finding these patterns is essential in moving the field and identifying possible pathways for future research. Given the large body of publications and the aim of this study to map the fields conceptual structure, bibliometric analysis is the most appropriate approach. Other common methods that are often compared with bibliometric analysis are meta-analysis and systematic literature reviews. Unlike systematic literature reviews (SLRs), which focus on a specific research question and qualitatively synthesize a limited number of studies, bibliometric analysis provides a broad, quantitative overview of an entire field by mapping relationships between authors, institutions and topics (Zupic, I., and Čater, 2015). While SLRs are useful for in-depth analysis, their manual and time-consuming nature makes them impractical for dealing with hundreds of thousands of publications. Meta-analysis, on the other hand, aggregates empirical findings from homogeneous studies to assess statistical relationships, making it suitable for synthesizing comparable results. However, as outlayed in the literature review, entrepreneurship research is highly heterogen in terms of different streams and definitions, which limits the feasibility of meta-analysis. As the aim is to map the conceptual landscape of the field rather than to synthesise empirical evidence, bibliometric analysis is the most effective method to identify key publications, research trends and thematic developments on a large scale (Passas, 2024).

This study applies a bibliometric approach to map the entrepreneurship literature, using quantitative methods to examine its structure and inform future research. The immediate outcome of the analysis of large bibliographic datasets is quantitative assessment, though allowing to draw insightful qualitative inference too. In order to setup our bibliometric study correctly, we did another literature review on bibliometric studies in entrepreneurship and discovered 26 articles that are focusing on niche topics in the field. Learning from their experiences as well as from the methods, specifications, and code used, we customized our own bibliometric study.[5]

[5] For an overview of relevant studies, see Online Appendix O-2.

Two main techniques are employed: performance analysis and science mapping. Performance analysis provides an overview of key research constituents, such as sources, authors, affiliations, and influential documents. Science mapping examines relationships among these elements, focusing on the conceptual, intellectual, and social structures of the field (Donthu et al., 2021). Our study centers on conceptual structure, particularly the evolution of concepts and terminology (Aria and Cuccurullo, 2025). Of the three common science mapping techniques – co-citation analysis, bibliographic coupling, and co-word analysis – only co-word analysis was suitable, as the other two require reference data. Web of Science (WoS) standardizes reference lists as FIRST AUTHOR, YEAR, JOURNAL, ISSUE, DOI, whereas Scopus retains full APA-style references, creating inconsistencies that complicate citation-based analyses and require extensive cleaning to reconcile reference formats. Given these challenges, co-word analysis is the most effective approach for conceptual analysis in a merged dataset (Donthu et al., 2021) as the one we built in this study.

Co-occurrence analysis (co-word analysis) identifies frequently co-occurring terms, assuming a thematic relationship (Donthu et al., 2021). Combined with thematic evolution mapping and take-off analysis, it helps uncover thematic clusters, track trends, and map the field's evolution (Donthu et al., 2021). Several software tools support both analysis and visualization, including *Bibliometrix, Biblioshiny, VOSviewer, BibExcel, SciMat, Pajek*, and *Gephi (Öztürk et al., 2024)*. In selecting software, compatibility with the dataset size was a critical factor. Even when staying within software limitations, processing a huge dataset was one of the biggest challenges. Given the computational demands of our large dataset, we used the *Bibliometrix R* package and *VOSviewer* for both analysis and visualization in this study.

Table 1 offers an overview of all methods applied in this study.

Table 1: Techniques, Methods and Output Applied

Technique	Methods	Output
Key statistical metrics	total number of citations, number of publications, h-index, g-index, m-index, average annual growth rates (AAGR)	most influential documents, authors, disciplines, institutions, and countries
Performance analysis	keywords (unigrams, bigrams, trigrams)	most relevant keywords
Scientific mapping analysis	keyword co-occurrence, thematic evolution	keyword clusters and evolution over time
Take-off analysis	growth curve, take-off point, trend dissemination analysis	trends origin and dissemination

Source: Own Elaboration

3.2. Software

Bibliometrix, an open-source R package developed in R by Aria and Cuccurullo, (2017), allows researchers to handle and integrate data from multiple databases, including Scopus, Web of Science, Dimensions, and others. Its ability to standardize and convert bibliographic data from diverse sources into a structured bibliographic data frame makes it particularly valuable for cross-database analysis. It enables descriptive statistics, network creation, normalization, and visualization (Aria and Cuccurullo, 2017). *Biblioshiny*, a web-based tool within *Bibliometrix*, provides an intuitive interface for exploring sources, authors, documents, and research structures (K-Synth Srl, 2025a).

VOSviewer, developed by Nees Jan van Eck and Ludo Waltman at Leiden University's Centre for Science and Technology Studies (CWTS), specializes in bibliometric network analysis, supporting bibliographic coupling, co-citation, and co-occurrence analysis (Centre for Science and Technology Studies, 2025). Its network visualization groups keywords, authors, and publications into clusters based on co-occurrence relationships. Links between items reflect relationship strength, measured by connection frequency and total link strength (Jan van Eck and Waltman, 2020). In this study, VOSviewer was utilized for the co-occurrence analysis of keywords to identify and visualize relationships between key terms in entrepreneurship research.

4. DATA COLLECTION

This section outlines the data sources, pre-tests, keyword selection, final search queries, extraction, and data merging process.

4.1. Data Sources

The study analyzed documents from Web of Science (WoS) and Scopus, two leading scientific databases. While Google Scholar offers broader coverage, it lacks data quality controls and bibliometric extraction support, making it unsuitable for this analysis (Delgado-Quirós et al., 2024; Martín-Martín et al., 2021). WoS, developed by Thomson Scientific, covers science, technology, social sciences, and humanities and is widely used for journal impact factor evaluation. Scopus, managed by Elsevier, indexes more journals (Elsevier, 2023). While WoS ensures higher data quality, Scopus generally reports higher total citations (Falagas et al., 2008; Pranckutė, 2021; Thelwall and Sud, 2022). To maximize coverage, both databases were combined without time restrictions, ensuring a comprehensive dataset.

4.2. Data Extraction

A keyword-based search was applied to capture entrepreneurship-related publications across disciplines. To include relevant studies beyond those explicitly mentioning *Entrepreneurship* in the titles, keywords, or abstracts, we combined a broad topic-based query with a category-based search. Given potential biases in keyword selection, a pre-test survey validated the keyword list.

4.2.1 Pre-Test

Experts were selected through purposive sampling, ensuring domain relevance (Engineer et al., 2023). Of 93 experts asked to participate in a short survey, 86 top-cited authors[6] and seven experts from our academic network, 16 experts participated in the survey between the 27th of November and the 9th of December 2024. Nine experts are based in Europe, five in the US, and two did not provide location information. Six participants specialize in *Entrepreneurship*, while the remaining ten are distributed across the fields of *Strategy & Management, Organizational Theory, Economics & Finance, Multidisciplinary Studies*, and *Computational Social Science*.

[6] Topic Search WoS: "Entrepreneur*" -> sorted by highly cited

During our literature review, we identified 27 entrepreneurship-related terms that are frequently occurring in relevant publications, including *Start-Up*, *New Venture*, and *New Firm.* Aligning with the broader framing of our study, the survey was designed to capture terms that reflect this broad understanding of entrepreneurship.[7] The selected keywords were then used in a manual test to assess the effectiveness of the proposed search query.

4.2.2 Manual Test

A manual test assessed whether retrieved publications genuinely belonged to entrepreneurship literature. The null hypothesis (H_0) assumed they did not, while the alternative (H_1) assumed they did. The test evaluated Type I and Type II errors (Doan, 2005). The results of the manual test remain within an acceptable range and lead us to the continuation of the study with the pre-evaluated keywords. The manual test is described in more detail in the *Online Appendix O-4.2.2.*

4.2.3 Final Search Query

The final search query consists of two subqueries: First, a broad search for "*Entrepreneur**" in the WoS *Topic field (Title, Abstract, Keywords, and Keywords Plus)* and Scopus *Article title, Abstract, Keywords* without additional restrictions, ensuring the inclusion of entrepreneurship literature across multiple disciplines. Second, a targeted search using our predefined list of keywords within the WoS *Business Economics* category and the Scopus categories *Business, Management and Accounting* and *Economics, Econometrics and Finance* to include relevant publications that may not explicitly mention Entrepreneurship or its variations either in the title, the abstract or in the keywords (and Keywords Plus in WoS, Index Terms in Scopus).

All keywords[8] were enclosed in quotation marks and followed by an asterisk to capture variations (e.g., *entrepreneur*ship, *entrepreneur*ial, *entrepreneur*s) while ensuring exact phrase matching (Clarivate Web of Science Help, 2023). This is particularly important since the keyword list includes multiple multi-word terms, ensuring precise retrieval of relevant publications. Table 2 presents the two queries.

[7] The whole pre-test is described in more detail in the Online Appendix O-4.2.1 together with the full list of keywords.

[8] One exception had to be made for company, since compan* would also include e.g. companion. We therefore listed the plural form manually.

Table 2: Final Search Queries Applied to WoS and Scopus

WoS	TS=("entrepreneur*") OR (TS=("Start-up*" OR "Startup*" OR "Start up*" OR "New Venture*" OR "Nascent Venture*" OR "Early-Stage Venture*" OR "New Firm*" OR "Nascent Firm*" OR "Early-Stage Firm*" OR "New Business Venture*" OR "Nascent Business Venture*" OR "Early-Stage Business Venture*" OR "New Business*" OR "Nascent Business*" OR "Early-Stage Business*" OR "New Business Model*" OR "Nascent Business Model*" OR "Early-Stage Business Model*" OR "New Organization*" OR "Nascent Organization*" OR "Early-Stage Organization*" OR "New Company" OR "Nascent Company" OR "Early-Stage Company" OR "New Companies" OR "Nascent Companies" OR "Early-Stage Companies" OR "Venture Creation*" OR "New Venture Creation*" OR "Business Incubator*" OR "Seed Accelerator*" OR "Opportunity Exploitation*" OR "Business Model Innovation*" OR "Innovative Business Model*" OR "Copreneur*" OR "Opportunity Exploration*" OR "Firm Birth*" OR "Founder*" OR "Business Creation*" OR "Business Accelerator*") AND WC=("Business Economics"))
Scopus	(TITLE-ABS-KEY("entrepreneur*")) OR (TITLE-ABS-KEY("Start-up*" OR "Startup*" OR "Start up*" OR "New Venture*" OR "Nascent Venture*" OR "Early-Stage Venture*" OR "New Firm*" OR "Nascent Firm*" OR "Early-Stage Firm*" OR "New Business Venture*" OR "Nascent Business Venture*" OR "Early-Stage Business Venture*" OR "New Business*" OR "Nascent Business*" OR "Early-Stage Business*" OR "New Business Model*" OR "Nascent Business Model*" OR "Early-Stage Business Model*" OR "New Organization*" OR "Nascent Organization*" OR "Early-Stage Organization*" OR "New Company" OR "Nascent Company" OR "Early-Stage Company" OR "New Companies" OR "Nascent Companies" OR "Early-Stage Companies" OR "Venture Creation*" OR "New Venture Creation*" OR "Business Incubator*" OR "Seed Accelerator*" OR "Opportunity Exploitation*" OR "Business Model Innovation*" OR "Innovative Business Model*" OR "Copreneur*" OR "Opportunity Exploration*" OR "Firm Birth*" OR "Founder*" OR "Business Creation*" OR "Business Accelerator*") AND SUBJAREA("BUSI" OR "ECON"))

Source: Own Elaboration

4.3 Data Export & Merging of Databases

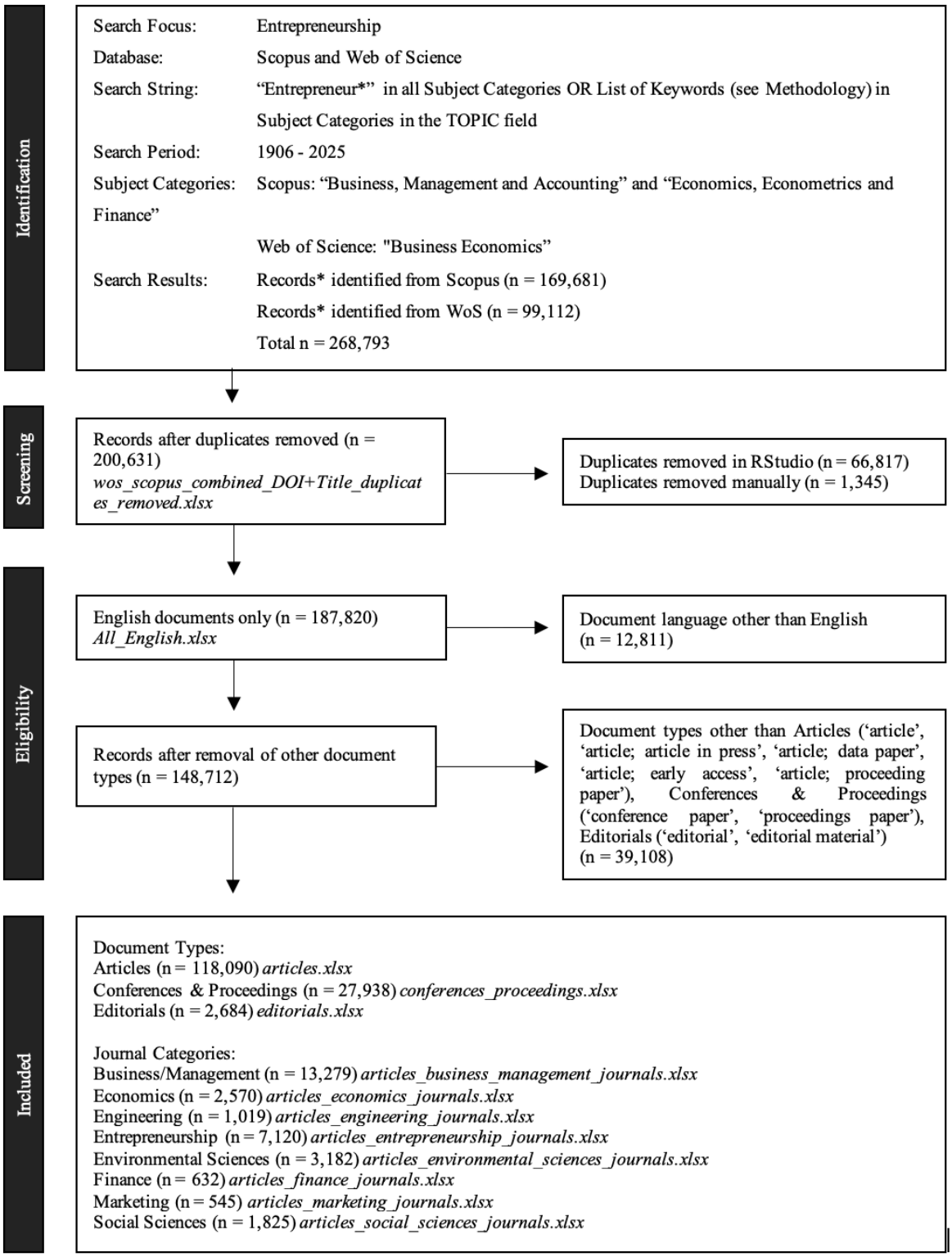
Merging data from Scopus and WoS posed challenges due to structural differences(Aria and Cuccurullo, 2017; K-Synth Srl, 2025b). Common bibliometric tools (e.g., *VOSviewer*, *CiteSpace*) do not support direct cross-database integration. Thus, a careful initial merging, deduplication, and cleaning process was implemented. Using the above search queries the final Dataset was searched and exported from Web of Science on Monday, January 6, 2025 and from Scopus on Tuesday, January 7, 2025. Given the vast dataset retrieved, we chose the *Bibliometrix* package for merging and standardizing the data for analysis (Harzing and Alakangas, 2016). Details are provided in the *Online Appendix O-4.3*. The merged and deduplicated full and cleaned dataset (*wos_scopus_combined_DOI+Title_duplicates_removed.xlsx*) was saved as an Excel file, preserving the bibliographic data frame of the *Bibliometrix R* package.

4.4 Final Data

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), the data retrieval process included four phases: identification,

screening, eligibility, and inclusion (Liberati et al., 2009; Page, Moher, et al., 2021; Page, McKenzie, et al., 2021;Moher et al., 2009). Those steps are presented in Figure 1.

Figure 1: PRISMA Statement Diagram and Steps in Bibliographic Data Identification and Search Refinement



Source: Own Elaboration

From 268,793 entrepreneurship-related records (WoS: 99,112; Scopus: 169,681), 200,631 remained after merging and deduplication in *Bibliometrix* and *Excel*. Further filtering retained English-language records in three document types: articles, conference proceedings, and editorials, ensuring focus on peer-reviewed research. Other document types were excluded after expert discussions, leaving us with the final datasets *articles.xlsx* (118,090 records), *conferences_proceedings.xlsx* (27,938), and *editorials.xlsx* (2,684).

We further identified the following eight journal categories: Business/Management (13,279 articles), Economics (2,570), Engineering (1,019), Entrepreneurship (7,120), Environmental Sciences (3,182), Finance (632), Marketing (545), and Social Sciences (1,825) that are subsets of the articles dataset. The category-building process is further addressed in section *5.1.4. Comparison Across Journal Categories*.

5. RESULTS

In the following, we introduce all analyses we applied to our dataset and describe the results. Using the data and methods outlined in Sections 3 and 4, we conducted a comprehensive bibliometric analysis of entrepreneurship literature, integrating performance analysis (metric perspective) and science mapping (semantic perspective). We examined statistical characteristics, keyword analysis (unigrams, bigrams, trigrams), keyword co-occurrence, thematic mapping, thematic evolution, and take-off analyses to explore the field in depth.

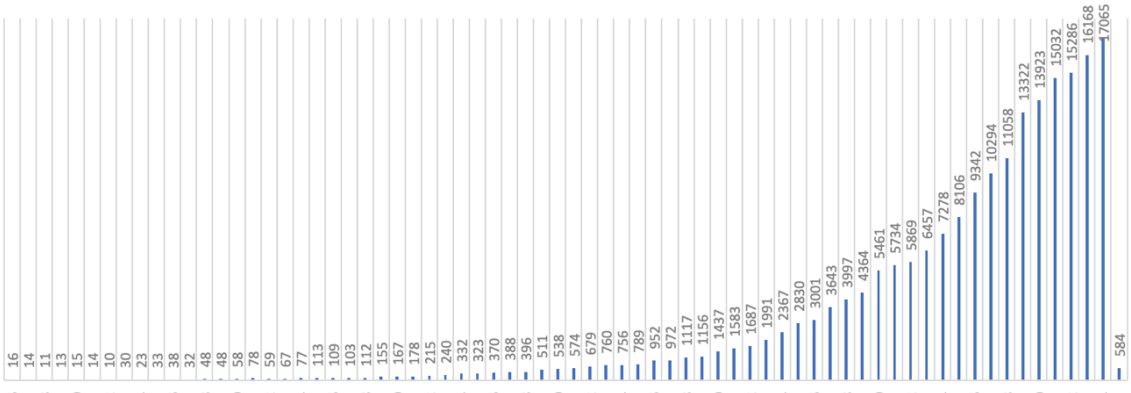
5.1 Basic Statistical Characteristics Related to the Entrepreneurship Literature

The following subchapters provide insights into the basic statistical characteristics related to the entrepreneurship field.

5.1.1 Overview of the Full Dataset

To gain an overview of scientific production, we first analyzed the full dataset of 200,631 records, covering all document types and languages.

Figure 2: Scientific Output from 1956 - 2025[9]



Source: Own Elaboration

Figure 2 presents the annual scientific output in entrepreneurship literature. Although the earliest publication dates back to 1906, we applied a minimum threshold of >10 publications per year, excluding 1906–1955 (63 publications) from the figure for clarity (Thelwall and Sud, 2022). Scientific ouput shows a steady increase in publications since

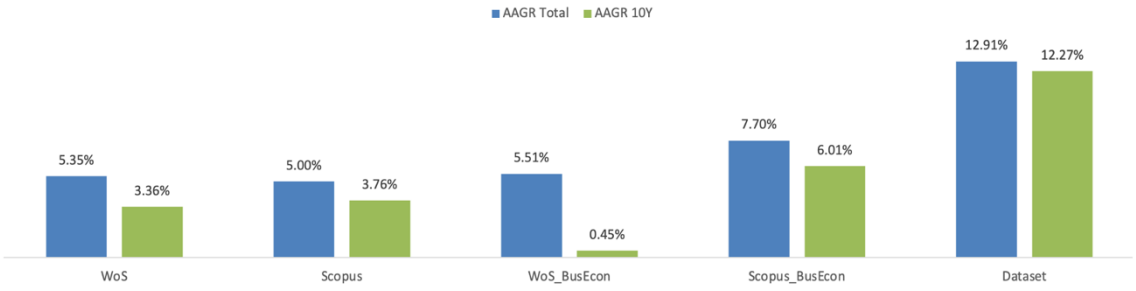
[9] Based on data extraxted and merged on the 7th of January 2025

the 1960s. In the two most recent years for which there is full information, 2023 and 2024, 33,233 documents were published, reflecting the field's continued growth.

We compared entrepreneurship research to overall publication trends in WoS and Scopus to contextualize this growth. We assessed long-term trends using the Average Annual Growth Rate (AAGR)[10] while filtering extreme fluctuations (Dotdash Meredith, n.d.).

To ensure a more realistic and comparable AAGR, we included annual growth rates only from 1964 onward, as it marks the first year since when steady growth is experienced. Figure 3 presents the AAGR across the full timespan as well as the past 10 years. The left bar (blue) represents the AAGR over the entire timespan, beginning in 1950 for WoS, Scopus, and the Scopus Business & Economics category, from 1956 for the WoS Business & Economics category (earliest records), and from 1964 for our dataset (all documents from all disciplines).

Figure 3: AAGR Comparison Across Databases/Datasets



Source: Own Elaboration

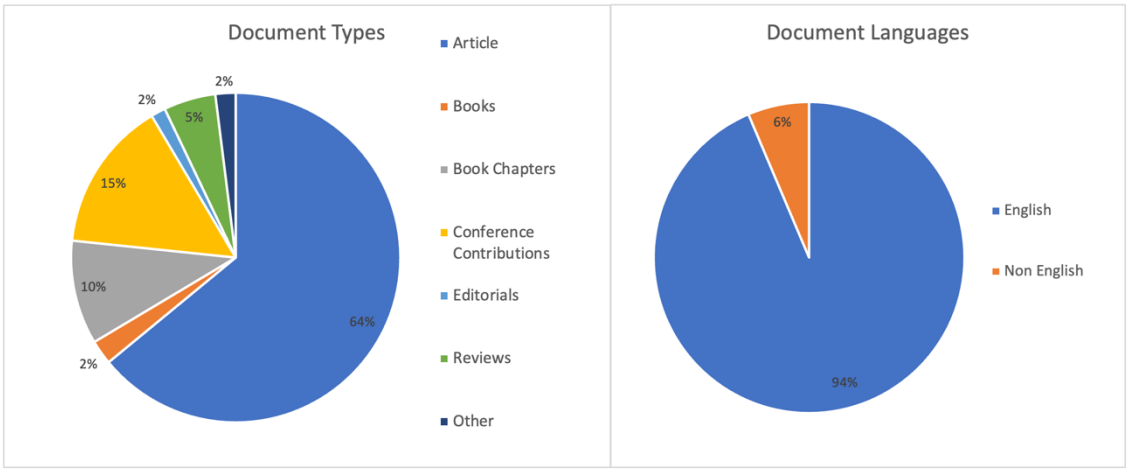
The right bar (green) indicates the AAGR over the last 10 years, allowing for a comprehensive comparison of long-term and short-term growth trends. The full WoS and Scopus exhibit relatively stable growth between 3% and 5% annually, aligning with broader trends found earlier in scientific publishing around 3.3%–4.7% (Gu and Blackmore, 2016). The WoS Business & Economics category consistently exhibits a lower AAGR than its Scopus equivalent. In the last 10 years, it dropped to a record low of just 0.45%, evidencing a significant deceleration. In contrast, its Scopus counterpart maintains higher AAGR values (between 6.01% and 7.7%), reflecting that Scopus indexes a faster-growing stake of Business & Economics than WoS. As for

[10] AAGR = Sum of Growth Rates per Period / Total Periods

Entrepreneurship research as computed by our dataset, it shows a remarkable significantly higher growth, peaking at 12.91% over the full period and 12.27% over the last 10 years, indicating that rapid expansion has continued though at a marginally lower rate. Overall, the data suggest that entrepreneurship remains a rapidly growing research domain, although the slight decline in AAGR in the most recent 10 years may indicate the field is moving now to a more mature development stage.

WoS and Scopus index multiple document types. Figure 4 shows that articles dominate (64%), followed by conference papers (15%), book chapters (10%), and reviews (5%). English accounts for 94% of publications. *Online Appendix O-5.1.1b* details subject areas. Scopus captures more technical fields, while WoS emphasizes political, social, and human sciences. For the substantial analyses in this study and all further steps, we focus on all English-speaking research articles only (94% of 200,631) in order to be capable to apply keyword analyses.

Figure 4: Distribution of Document Types and Languages



Source: Own Elaboration

To assess the impact of scientific output in entrepreneurship research, we used total citations (TC), citations per year (C/Y), and number of publications (NP), ranking documents by TC (García-Villar and García-Santos, 2021). Table 3 lists the top 10 most cited documents with Venkatesh, Morris, Davis, and Davis (2003) leading at 26,548 citations, followed by Teece (2007), Shane and Venkataraman (2000), Uzzi (1997), and Porter (1998). The top three publications were published in the early 2000s, while most others date from the late 1980s to 1990s, indicating that core concepts and perspectives in entrepreneurship research remain highly influential over time. Though early studies

emphasized firm performance, the most cited works focus on theory-building, reflecting the field's ongoing effort to establish a strong conceptual foundation. Notably, several of the top-cited publications do not focus on entrepreneurship in the stricter sense of new venture creation, but rather approach it from adjacent fields such as strategy, innovation or organisational theory, demonstrating the multidisciplinary nature of the field.

Table 3: Top 10 Most Cited Documents

Rank	Paper	Author	PY	TC	C / Y	Journal
1	USER ACCEPTANCE OF INFORMATION TECHNOLOGY: TOWARD A UNIFIED VIEW	VENKATESH VISWANATH; MORRIS MICHAEL G.; DAVIS GORDON B.; DAVIS FRED D.	2003	26548	1,154.26	MIS QUARTERLY: MANAGEMENT INFORMATION SYSTEMS
2	EXPLICATING DYNAMIC CAPABILITIES: THE NATURE AND MICROFOUNDATIONS OF (SUSTAINABLE) ENTERPRISE PERFORMANCE	TEECE DAVID J.	2007	6953	365.95	STRATEGIC MANAGEMENT JOURNAL
3	THE PROMISE OF ENTREPRENEURSHIP AS A FIELD OF RESEARCH	SHANE SCOTT;VENKATARAMAN S	2000	6600	253.85	ACADEMY OF MANAGEMENT REVIEW
4	SOCIAL STRUCTURE AND COMPETITION IN INTERFIRM NETWORKS: THE PARADOX OF EMBEDDEDNESS	UZZI BRIAN	1997	5512	190.07	ADMINISTRATIVE SCIENCE QUARTERLY
5	CLUSTERS AND THE NEW ECONOMICS OF COMPETITION.	PORTER MICHAEL	1998	5385	192.32	HARVARD BUSINESS REVIEW
6	CLARIFYING THE ENTREPRENEURIAL ORIENTATION CONSTRUCT AND LINKING IT TO PERFORMANCE	LUMPKIN G T;DESS GREGORY	1996	4849	161.63	ACADEMY OF MANAGEMENT REVIEW
7	MANAGEMENT OWNERSHIP AND MARKET VALUATION. AN EMPIRICAL ANALYSIS	MORCK RANDALL;SHLEIFER ANDREI;VISHNY ROBERT W.	1988	4043	106.39	JOURNAL OF FINANCIAL ECONOMICS
8	STRATEGIC MANAGEMENT OF SMALL FIRMS IN HOSTILE AND BENIGN ENVIRONMENTS	COVIN JEFFREY G;SLEVIN DENNIS P.	1989	3835	103.65	STRATEGIC MANAGEMENT JOURNAL
9	EMBEDDED AUTONOMY: STATES AND INDUSTRIAL TRANSFORMATION	EVANS PETER	2012	3632	259.43	EMBEDDED AUTONOMY: STATES AND INDUSTRIAL TRANSFORMATION
10	FRICTION: AN ETHNOGRAPHY OF GLOBAL CONNECTION	TSING ANNA LOWENHAUPT	2011	3323	221.53	FRICTION: AN ETHNOGRAPHY OF GLOBAL CONNECTION

Source: Own Elaboration PY = Publication Year; TC = Total Citations; C / Y = Citations per Year

Table 4 ranks leading journals, authors, institutions, and countries by NP and TC. While *Sustainability* has the highest publication volume with 2,087 publications, it is not among the most cited. Instead, the *Journal of Business Venturing* leads with 190,700 citations, followed by *Entrepreneurship Theory and Practice*, and *Small Business Economics*. Interestingly, only a few journals appear in both top 10s by volume and citation count, suggesting that publication quantity and scholarly recognition are only weakly correlated. Among authors, Morris M. is the most cited, with 33,253 citations, followed by Shane S. (28,253 citations) and Wright M. (27,725 citations). The top research institution in entrepreneurship is Indiana University Bloomington, with 1,096 publications, followed by Erasmus University Rotterdam and Universidade da Beira Interior in Covilhã, Portugal. The USA leads in entrepreneurship research with 999,314 citations, followed by the UK (345,071 citations), Canada (138,240 citations), Germany (129,804 citations), and China (128,736 citations).

Table 4: Top 10 Journals, Authors, Institutions, and Countries

Top 10 Journals NP		Top 10 Journals TC		Top 10 Authors TC		Top 10 Institutions NP		Top 10 Countries TC	
SUSTAINABILITY	2087	JOURNAL OF BUSINESS VENTURING	190700	MORRIS MICHAEL G.	33253	INDIANA UNIV	1096	USA	999314
SMALL BUSINESS ECONOMICS	1740	ENTREPRENEURSHIP THEORY AND PRACTICE	102623	SHANE SCOTT	28253	ERASMUS UNIV	897	UNITED KINGDOM	345071
JOURNAL OF BUSINESS VENTURING	1304	SMALL BUSINESS ECONOMICS	95368	WRIGHT MIKE	27725	UNIV BEIRA INTERIOR	809	CANADA	138240
JOURNAL OF BUSINESS RESEARCH	1139	STRATEGIC MANAGEMENT JOURNAL	77736	VENKATESH VISWANATH	26712	UNIV N CAROLINA	777	GERMANY	129804
ENTREPRENEURSHIP AND REGIONAL DEVELOPMENT	911	RESEARCH POLICY	62724	DAVIS GORDON B.	26569	BUCHAREST UNIV ECON STUDIES	771	CHINA	128736
INTERNATIONAL ENTREPRENEURSHIP AND MANAGEMENT JOURNAL	908	JOURNAL OF BUSINESS RESEARCH	55146	DAVIS FRED D.	26549	ZHEJIANG UNIV	737	NETHERLANDS	99994
INTERNATIONAL JOURNAL OF ENTREPRENEURSHIP AND SMALL BUSINESS	907	ACADEMY OF MANAGEMENT JOURNAL	52446	ZAHRA SHAKER A	26164	UNIV VALENCIA	722	SPAIN	98302
ASEE ANNUAL CONFERENCE AND EXPOSITION, CONFERENCE PROCEEDINGS	872	ACADEMY OF MANAGEMENT REVIEW	52189	AUDRETSCH DAVID B	24461	HARVARD UNIV	709	ITALY	97964
ENTREPRENEURSHIP THEORY AND PRACTICE	860	ENTREPRENEURSHIP AND REGIONAL DEVELOPMENT	44235	SHEPHERD DEAN A	24454	UNIV TORONTO	680	SWEDEN	80948
JOURNAL OF SMALL BUSINESS MANAGEMENT	853	JOURNAL OF CLEANER PRODUCTION	42560	IRELAND R DUANE	17731	UNIV CAMBRIDGE	675	AUSTRALIA	78619

Source: Own Elaboration

TC = Total Citations; NP = Number of Publications

The USA dominates citations (999,314), followed by the UK (345,071), Canada (138,240), Germany (129,804), and China (128,736). While China surpassed the US in publication volume (2022–2025), the US remains the most cited and central to global research collaborations, particularly with the UK, Canada, and Germany, whereas China's research is more domestically focused. *Online Appendix O-5.1.1c* provides a global collaboration map for further insights.

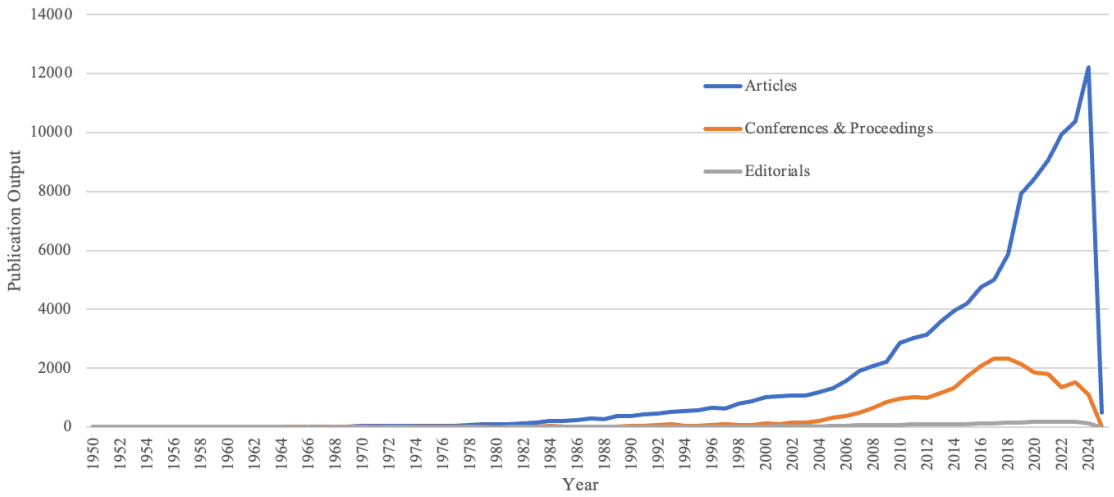
5.1.3 Comparison Across Article Types

Figure 5 illustrates publication trends for articles, conference proceedings, and editorials, revealing notable differences.

Since 2018, articles have surged (+35% from 2018–2019, +18% from 2023–2024), while conference proceedings have declined. Editorials, though fewer, have grown steadily over 60 years, shaping discourse and reflecting field developments. While the first entrepreneurship article appeared in 1906, minimal activity occurred until the late 1940s, so the diagram starts at 1950 for clarity. Despite the publication boom in recent years, citations have dropped sharply since 2020. The 2025 decline is due to incomplete data, but the earlier drop suggests broader shifts, such as changing citation behavior or evolving publication strategies. However, the longest period of entrepreneurship research

shows growth in both publications and influence representing growing maturity and interdisciplinary adoption of entrepreneurship research.

Figure 5: Scientific Production per Year Across Document Types



Source: Own Elaboration

Online Appendix O-5.1.3 provides a detailed breakdown by article type. Overall, articles dominate scholarly output, conference proceedings have lost impact, and editorials, while less frequent, have grown in influence. The decline in editorial citations may reflect shifting citation trends or structural changes in the field.

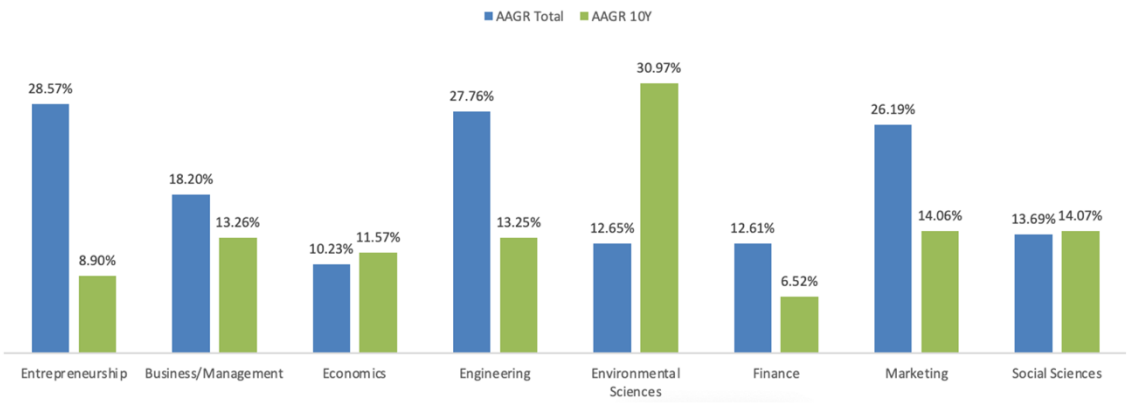
5.1.4 Comparison Across Journal Categories

To analyze growth trends across research areas, we categorized all 118,090 articles from 9,437 journals based on the research areas of the top 100 journals ranked by g-index, a variant of the h-index (Egghe, 2006). Other than the h-index which measures the highest number of a scholar's publications with at least that many citations, the g-index was chosen since it gives more weight to highly-cited papers by focusing on the total citations of a scholar's top publications (Costas and Bordons, 2008). Considering the Scimago Journal & Country Rank Categories the journals have been grouped as follows with the numbers in parenthesis indicating the number of journals within that group: Business/Management (47), Economics (11), Engineering (2), Entrepreneurship (15), Environmental Sciences (5), Finance (5), Marketing (4), and Social Sciences (11) (Scimago Lab, 2024). Despite the high NPs across business/management, economics, and social sciences, these categories are not the ones with the highest growth rates, with other

fields experiencing faster expansion over time. The following analysis, based on all 118,090 articles, examines long-term growth trends by calculating the AAGR for each research area.

Figure 6 presents the AAGR across categories, providing a more structured view of long-term growth trends, adjusting for the extreme fluctuations. Several categories outperform Business and Economics in growth. Environmental Sciences leads with a 30.97% AAGR over the last decade, reflecting the rising importance of sustainability research. Entrepreneurship, historically strong (28.57%), has slowed to 8.90%, suggesting a shift toward consolidation rather than rapid expansion. Engineering and Marketing maintain high growth rates, though both have declined in the past 10 years. As for Finance, it shows a slower expansion (6.52%), indicating a relatively reduced research focus. Social Sciences exhibit moderate but steady growth. These trends signal a shift in research priorities, with sustainability-related disciplines growing rapidly, while traditional Business and Finance disciplines evolve at a steadier, more incremental pace.

Figure 6: AAGR Across Journal Categories



Source: Own Elaboration

In the *Online Appendix O-5.1.4* we show the categorization of articles according to the Sustainable Development Goals (SDGs).

5.2 Performance by Document Type and Journal Category

To assess academic influence, we analyze the top articles, journals, institutions, authors, and countries based on total citations (TC) and publication volume (NP), capturing both impact and research productivity, across document types and journal categories.

5.2.1 Per Document Type

Venkatesh et al. (2003) leads with 26,548 citations, introducing the Unified Theory of Acceptance and Use of Technology (UTAUT). Shane and Venkataraman (2000) follow with 6,600 citations for positioning entrepreneurship as a distinct through the lens of opportunity. Uzzi (1997), with 5,512 citations, highlights the dual effects of social ties in interfirm networks. Among conference papers, Duran et al., (2016) is the most cited (647 citations), exploring innovation in family firms. Notable editorials include Barney, Ketchen, and Wright (2011) with a total of 908 citations about whether resource-based theory (RBT) will evolve or decline, highlighting key themes and opportunities for its revitalization. See *Appendix A-5.2.1* for the full table of most cited documents by total citations.

Table 5 presents the most cited authors across the different document types.

Table 5: Top 10 Most Cited Authors

Articles		Conferences & Proceedings		Editorials	
MORRIS MICHAEL G.	31981	ZHANG D	703	WRIGHT MIKE	2328
VENKATESH VISWANATH	26712	VAN ESSEN MARC	655	KETCHEN JR DAVID	1882
DAVIS GORDON B.	26565	DURAN PATRICIA	647	IRELAND R DUANE	1467
DAVIS FRED D.	26548	KAMMERLANDER NADINE	647	GARUD RAGHU	1386
WRIGHT MIKE	23473	ZELLWEGER THOMAS	647	BARNEY JAY B	1299
SHANE SCOTT	23255	HAO, LIANG	638	HITT MICHAEL A	1131
ZAHRA SHAKER A	21484	MELLOR STEPHEN	638	ZAHRA SHAKER A	1006
AUDRETSCH DAVID B	21035	ABRAHAMSSON PEKKA	587	SIEGEL DONALD	964
SHEPHERD DEAN A	17743	WANG XIAOFENG	538	SEXTON DL	859
COVIN JEFFREY G	13388	MAIR JOHANNA	513	CAMP SM	855

Source: Own Elaboration

Table 6 ranks the journals by TC. Articles: The *Journal of Business Venturing* leads with 180,241 total citations, followed by the *Small Business Economics* and *Entrepreneurship Theory and Practice*. Conferences & Proceedings: *ASEE Annual Conference and Exposition* ranks first *(*2,293 total citations), followed by the *International Journal of Innovation Management*. The first and second-ranked journals that published editorials are the *Entrepreneurship Theory and Practice* with 3,642 citations and the *Academy of Management Review* with 2,681 citations.

Table 6: Top 10 Journals and Conferences, Total Citations (TC)

Articles		Conferences & Proceedings		Editorials	
JOURNAL OF BUSINESS VENTURING	180241	ASEE ANNUAL CONFERENCE AND EXPOSITION, CONFERENCE PROCEEDINGS	2293	ENTREPRENEURSHIP THEORY AND PRACTICE	3642
SMALL BUSINESS ECONOMICS	88113	INTERNATIONAL JOURNAL OF INNOVATION MANAGEMENT	1799	ACADEMY OF MANAGEMENT REVIEW	2681
ENTREPRENEURSHIP THEORY AND PRACTICE	77081	LECTURE NOTES IN BUSINESS INFORMATION PROCESSING	1690	JOURNAL OF BUSINESS VENTURING	2270
STRATEGIC MANAGEMENT JOURNAL	61203	ACADEMY OF MANAGEMENT ANNUAL MEETING PROCEEDINGS	1217	STRATEGIC MANAGEMENT JOURNAL	1998
RESEARCH POLICY	59045	SOCIAL ENTREPRENEURSHIP-BOOK	1120	JOURNAL OF MANAGEMENT	1886
JOURNAL OF BUSINESS RESEARCH	52291	INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS	821	JOURNAL OF MANAGEMENT STUDIES	1394
ACADEMY OF MANAGEMENT JOURNAL	44066	JOURNAL OF BUSINESS VENTURING	786	ORGANIZATION STUDIES	1011
ENTREPRENEURSHIP AND REGIONAL DEVELOPMENT	40571	ACADEMY OF MANAGEMENT JOURNAL	647	ENTREPRENEURSHIP AND REGIONAL DEVELOPMENT	954
ACADEMY OF MANAGEMENT REVIEW	39452	PROCEDIA COMPUTER SCIENCE	573	JOURNAL OF INTERNATIONAL BUSINESS STUDIES	854
JOURNAL OF SMALL BUSINESS MANAGEMENT	37504	PROCEEDINGS OF 2013 INTERNATIONAL CONFERENCE ON INDUSTRIAL ENGINEERING AND SYSTEMS MANAGEMENT, IEEE - IESM 2013	547	ORGANIZATION AND ENVIRONMENT	795

Source: Own Elaboration

Looking at the top 10 research institutions (Table 7), the Indiana University Bloomington, USA leads in article (921 articles) and editorial output (62 editorials). Most conferences & proceedings were produced by the Bucharest University of Economic Studies in Romania (473).

Table 7: Top 10 Research Institutions, Number of Publications (NP)

Articles		Conferences & Proceedings		Editorials	
INDIANA UNIV	921	BUCHAREST UNIV ECON STUDIES	473	INDIANA UNIV	62
ERASMUS UNIV	807	BINA NUSANTARA UNIVERSITY	239	UNIV VALENCIA	34
UNIV N CAROLINA	685	UNIVERSITI MALAYSIA KELANTAN	227	COPENHAGEN BUSINESS SCH	28
UNIV BEIRA INTERIOR	666	WUHAN UNIV TECHNOL	196	UNIV ALBERTA	28
UNIV VALENCIA	631	UNIV TEKNOL MARA	193	JOHNS HOPKINS UNIV	27
HARVARD UNIV	595	UNIV POLITEHN BUCURESTI	168	UNIV BIRMINGHAM	27
UNIV TORONTO	588	COMENIUS UNIV	160	HARVARD UNIV	26
LUND UNIV	552	ZHEJIANG UNIV	159	MCGILL UNIV	26
UNIV CAMBRIDGE	545	CZESTOCHOWA TECH UNIV	136	YORK UNIV	26
UNIV UTRECHT	534	UNIV PENDIDIKAN INDONESIA	124	ERASMUS UNIV	25

Source: Own Elaboration

Table 8 shows the USA leads in citations across all types, with the UK and Canada ranking second and thirs for articles and editorials. Germany and China follow for conferences & proceedings.

Table 8: Top 10 Countries, Total Citations (TC)

Articles		Conferences & Proceedings		Editorials	
USA	854039	USA	7709	USA	18026
UNITED KINGDOM	298260	GERMANY	3597	UNITED KINGDOM	5212
CANADA	123676	CHINA	2776	CANADA	2564
CHINA	118676	UNITED KINGDOM	2347	GERMANY	2133
GERMANY	111657	MALAYSIA	2251	NETHERLANDS	1705
SPAIN	88662	ITALY	1990	CHINA	1168
ITALY	87898	ROMANIA	1587	AUSTRALIA	959
NETHERLANDS	87756	TURKEY	1491	ITALY	935
SWEDEN	71365	INDONESIA	1430	SPAIN	808
AUSTRALIA	69803	POLAND	1322	FRANCE	801

Source: Own Elaboration

5.2.2 Per Journal Category

The most cited articles across journal categories are described hereafter. Business/management: With 6,600 total citations Shane and Venkataraman (2000) are first, followed by Porter (1998) with 5,385 citations, and Covin and Slevin (1989) with 3,835 citations. Economics: Djankov, La Porta, Lopez-de-Silanes, and Schleifer (2002) lead with a total of 2,152 citations, ranked second Carlsson and Stanekiewicz (1991) with 1,247 citations and ranked third Acs, Braunerhjelm, Audretsch, and Carlsson (2009) with 1,190 citations. Engineering: Ulhoi (2005) is most cited with 958 total citations, followed by D'Este and Perkmann (2011) with 625 citations, and Bercovitz and Feldman (2006) with 596 citations. Entrepreneurship: Austin, Stevenson, and Wei-Skillern (2006) received 1,941 citations, followed by Linan and Chen (2009) with 1,861, and Alvarez and Barney (2007) with 1,280 citations. Environmental Sciences: Schaltegger and Wagner (2011) lead with 1,006 total citations, followed by Evans, Vladimirova, Holgado et. al (2017) with 819, and Geissdoerfer, Morioka, De Carvalho et. al (2018) with 795 citations. Finance: With 4,043 citations Morck, Schleifer, and Vishny (1988) are first, followed by Villalonga and Amit (2006) with 2,441 citations, and Sahlman (1990) with 1,458 citations. Marketing: The number one article was written by Hult, Hurley, and Knight (2004) and has a total number of 1,244 citations, followed by Denhardt and Denhardt (2000) with 753 citations, and Eikenberry and Kluver (2004) with 750 citations. Social Sciences: Number one with 5,512 total citations for Uzzi (1997), Baker and Nelson (2005) with 2,185 citations and Stuart, Hoang, and Hybels (1999) with 1,618 citations. We show the full list of Top 10 Most Cited Articles across the different journal categories in *Appendix A-5.2.2a* For the top 10 most cited authors per journal category see *Appendix A-5.2.2b*.

Business/Management: The *Journal of Business Venturing* is in first place with 180,241 citations, followed by the *Strategic Management Journal* (61,203), and *Research Policy* (59,045). Economics: *Small Business Economics* in first rank with 88,113 total citations, followed by *American Economic Review* (9,772), and *Quarterly Journal of Economics* (9,358). Engineering: *Technovation* with 26,551 total citations and *Journal of Technology Transfer* with 20,563 total citations, followed by *IEEE Transactions on Engineering Management* with 5,347 citations. Entrepreneurship: Top 1 is

Entrepreneurship Theory and Practice with 77,081 total citations, followed by *Entrepreneurship and Regional Development* in second place with 40,571 total citations, followed by the *International Entrepreneurship and Management Journal* in third place with 26,014 total citations. Environmental sciences: The *Journal of Cleaner Production* (31,167) and *Sustainability* (22,690) are the most relevant journals, followed by *Regional Studies* third spot with 12,246 total citations. Finance: The *Journal of Financial Economics* as top 1 with 21,128 total citations, *Venture Capital* (8,984) is second and the *Journal of Corporate Finance* (6,609) third. Marketing*: Industrial Marketing Management* is the most influential journal with 16,353 total citations, followed by the *International Marketing Review* with 5,181 citations, and the *Public Administration Review* (4,789). Social sciences: *Administrative Science Quarterly* is in first place with 23,105 total citations, followed by *Education and Training* (18,118), and *World Development* (8,770). See *Appendix A-5.2.2c* for the full table of the top journals sorted by total citations.

Appendix A-5.2.2d presents the top 10 research institutions, sorted by NP. The Indiana University Bloomington is the most productive institution in three categories: business/management with 342 publications, engineering with 57 publications, and entrepreneurship with 144 publications. In economics the Erasmus University Rotterdam is the most productive with 128 publications, in environmental sciences the Bucharest University of Economic Studies (81), in finance the Harvard University (20), in marketing the Uppsala University with 18 publications, and finally the Lund University with 44 publications in social sciences.

The USA leads in total citations across all categories, except for Environmental Sciences, where the UK ranks first. The UK also holds second place in Business/Management, Engineering, Entrepreneurship, Marketing, and Social Sciences, highlighting its strong research presence. Germany ranks second in Economics, while China leads in Environmental Sciences and Canada in Finance. Other highly productive countries include Australia, New Zealand, and several Scandinavian and Western European nations, reflecting a broad international contribution to entrepreneurship research. See *Appendix A-5.2.2e* for the top 10 countries ranked by total citations.

5.3 Keyword Analysis

Keywords in bibliometric analysis are essential for identifying research themes and relationships, as they are extracted directly from publications (Guo et al., 2021). Unlike citation-based techniques, co-word analysis examines the actual content of a publication, utilizing author keywords, index keywords, titles, abstracts, or full texts (Donthu et al., 2021). Author keywords are deliberately chosen by the authors to best represent a publication's core themes, ensuring relevance and visibility. In contrast, Keywords' Plus (WoS) are algorithmically generated from reference titles within the Clarivate database (Knowledge, 2022; Aria and Cuccurullo, n.d.-b), while Index Keywords (Scopus) are controlled vocabulary terms assigned based on external thesauri (Elsevier B.V., 2019). Although index keywords are broader and may not always accurately reflect an article's content, they remain effective for mapping scientific knowledge structures (Neff and Corley, 2009) (Aria and Cuccurullo, n.d.). Since they are derived from reference titles and take time to accumulate, they may not be the most suitable unit of analysis for identifying emerging topics. Another critical aspect is the availability of keyword data (Neff and Corley, 2009). In our article's dataset of 118,090 records, 80% (93,643) include author keywords, whereas only 57% (67,153) contain index keywords. Abstracts provide another potential unit of analysis but require substantial preprocessing to filter out generic terms, while full-text keywords demand even more extensive cleaning and were not included due to data unavailability (Neff and Corley, 2009). Given these considerations, this study focuses on author keywords, index keywords, and title terms as the primary units of analysis. We begin by comparing author and index keywords across document types and journal categories before conducting a detailed article-level examination of keyword distributions.

5.3.1 Per Document Type

Figure 7 presents authors' keyword clouds derived from *Biblioshiny* from left to right: articles, conferences & proceedings, and editorials. Figure 8 presents the index keyword clouds in the same document type sequence. The size of the words represents the frequency of occurrences. For authors' keywords, we see a quite similar distribution across document types. Entrepreneurship, Innovation, and Performance emerge as core academic keywords, reflecting their centrality in research discussions. Beyond

Entrepreneurship and its variations, Innovation consistently ranks among the most used terms, indicating a strong thematic connection between the two. In articles, the most frequent author keywords are *Innovation* (5,748), *Sustainability* (1,924), and *Social Entrepreneurship* (1,914), in conferences and proceedings, the focus shifts toward education-related terms, with *Innovation* (1,727), *Entrepreneurship Education* (736), and *Education* (540) as the most frequent author keywords, and in editorials, we see *Innovation* (1,179), *Entrepreneurship Education* (559), and *Education* (427).

Figure 7: Author Keywords - Articles, Conferences & Proceedings, Editorials

Source: Biblioshiny

The index keyword wordclouds in figure 8 show bigger differences among document types. For articles *Performance* (10,401), *Innovation* (8,656), and *Impact* (6,369) lead among index keywords. In conferences & proceedings *Students* (1,809), *Engineering Education* (1,168), and *Innovation* (1,106) lead among index keywords, while *Performance* (659), *Innovation* (501), and *Management* (308) are the most frequently occurring within editorials.

Figure 8: Index Keywords - Articles, Conferences & Proceedings, Editorials

Source: Biblioshiny

Overall, the results highlight Innovation's pervasive role in entrepreneurship research and reveal distinct thematic differences between document types, with articles favoring broader theoretical and impact-related terms, while conference proceedings and editorials emphasize education and applied aspects of the field. We show a full list of the most frequently occurring authors and index keywords across document types in *Appendix A-5.3.1.*

5.3.2 Per Journal Category

We compared keywords across eight journal categories: Entrepreneurship, Business/Management, Economics, Engineering, Environmental Sciences, Finance, Marketing, and Social Sciences. *Entrepreneurship* is the most frequent author keyword in all categories except Finance and Marketing, where *Venture Capital* and *Internationalization* dominate, followed by *Entrepreneurship*.

Index keywords highlight *Performance* and *Entrepreneurship* as central in Entrepreneurship, Business/Management, and Economics, with variations such as *Innovation*, *Impact*, and *Growth* across fields. *Venture Capital* is prevalent in Finance, Economics, and Business/Management, reflecting investment and structural concerns.

Emerging trends show the growing relevance of *Social Entrepreneurship* in Entrepreneurship, Business/Management, and Social Sciences, while *Sustainability* and *Circular Economy* are prominent in Environmental Sciences. Engineering and Social Sciences emphasize education, while Marketing uniquely focuses on *Market Orientation*, highlighting competition and strategy. The full table is presented in the *Online Appendix O-5.3.2.*

5.3.3 Article Keywords

After examining author and index keywords across document types and journal categories, we further analyzed article-level keywords, focusing on author keywords, index keywords, and title unigrams, bigrams, and trigrams. The detailed results can be found in the *Online Appendix O-5.3.3*.

The results mainly show the long-term stability of core entrepreneurship research themes, such as Entrepreneurship and Innovation, alongside the dynamic emergence of new topics like Sustainability, Digital Transformation, and Social Entrepreneurship. While some keywords have steadily maintained prominence, others have experienced rapid bursts in response to external events or shifting academic focus. The weighted ranking highlights the impact of burst keywords, emphasizing the evolving and responsive nature of research trends in the field.

5.4 Keyword Co-Occurrence Analysis

To uncover central topics in entrepreneurship research, we performed a co-occurrence analysis of keywords. When two keywords appear together in the same paper, we assume that they signal a conceptual link between the topics they represent. Clusters of co-occurrences therefore highlight research themes within the literature (Cambrosio et al., 1993). The aim of co-occurrence analysis is not only to map a research field but to reveal the evolving strategies by which scholars define problems and position themselves in the field. By capturing these dynamics, co-occurrence analysis serves as a tool for understanding the structure and transformation of socio-cognitive networks (Small, 1988). We performed the analysis using VOSviewer, which applies modularity-based clustering to group strongly related keywords while minimizing cross-cluster connections (van Eck and Waltman, 2014;Newman, 2006). Keywords are visualized as nodes, with link strength representing how often two terms co-occur. A high total link strength indicates a keyword's strong connection to multiple others, making it central to the research field. Each cluster is named after the keyword with the highest total link strength to reflect its dominant theme (Waltman et al., 2010; Newman, 2006).

VOSviewer offers three visualization types: (1) Network visualization, where node size represents total link strength and color denotes clusters; (2) Overlay visualization, which adds a temporal dimension, showing early-emerging keywords in dark blue and recent ones in bright yellow; and (3) Density visualization, which highlights areas of high research activity using a color gradient from blue (low density) to yellow (high density) (Jan van Eck and Waltman, 2020).

To ensure a structured analysis, we examined keyword co-occurrence from two perspectives: document types (articles, conference proceedings, editorials) and journal categories (business/management, economics, engineering, environmental sciences, entrepreneurship, finance, marketing, and social sciences). A detailed breakdown of VOSviewer's mathematical, statistical, and computational methods is provided in the *Online Appendix O-5.4.*

5.4.1 Per Document Type

Since the articles dataset is the largest one with 118,090 records, we had to set a high threshold for minimum keyword occurrences of 112 to ensure the total keywords in the network remain below 1000. 991 keywords met the threshold and were grouped into 7 clusters. Within the conferences & proceedings dataset 991 keywords met the threshold of minimum 22 keywords and were grouped into 7 clusters. 300 of the keywords within the editorials dataset meet the threshold of 5 minimum keyword occurrences and were grouped into 9 clusters. Table 9 presents the clusters per document type.

Table 9: Clusters per Document Type

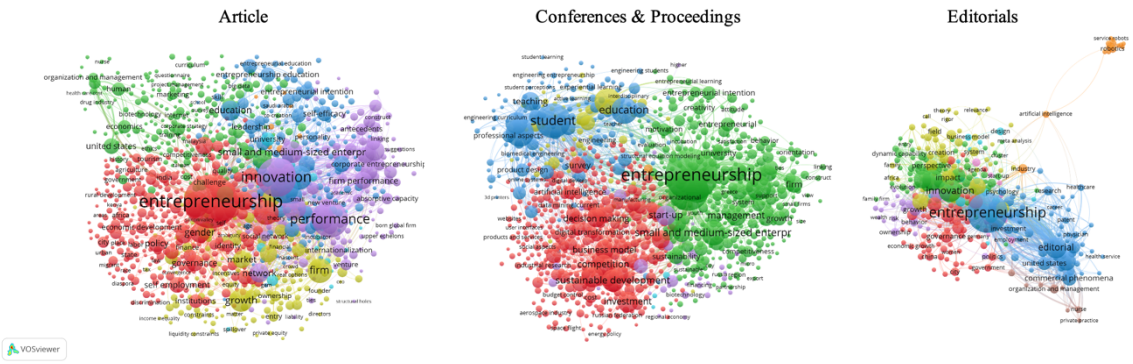
Articles				
Cluster	**Color**	**Name**	**Keywords**	**Total Link Strength**
1	Red	Entrepreneurship	business, entrepreneur, organization, gender, policy, governance, sustainability, enterprise, china, dynamic	155751
2	Purple	Performance	innovation, management, knowledge, strategy, entrepreneurial orientation, small and medium-sized enterprise, network, firm performance, capability, orientation	100531
3	Blue	Impact	model, education, perspective, entrepreneurial, behavior, self-efficacy, opportunity, intention, creation, entrepreneurial intention	55058
4	Yellow	Firm	growth, determinants, market, start-up, investment, research and development, information, ownership, economic growth, risk	45859
5	Green	Technology	industry, united states, human, decision making, economics, commercial phenomena, business model, sustainable development, competition, organization and management	25166
6	Light Blue	University	science, evolution, technology transfer, collaboration, commercialization, entrepreneurial ecosystem, academic entrepreneurship, knowledge transfer, entrepreneurial university, spin-off	12598
7	Orange	Sustainable Entrepreneurship	green, drivers, environmental, eco-innovation, factor, green innovation, green entrepreneurship	3450
Conferences & Proceedings				
Cluster	**Color**	**Name**	**Keywords**	**Total Link Strength**
1	Green	Entrepreneurship	innovation, performance, small and medium-sized enterprise, management, technology, entrepreneur, firm, model, knowledge, entrepreneurial orientation	16147
2	Blue	Student	engineering education, curriculum, education, teaching, education computing, engineering research, professional aspects, societies and institutions, product design, project management	12019
3	Red	Sustainable Development	commerce, competition, economics, investment, industry, economic and social effects, decision making, business model, information systems, industrial management	4776
4	Yellow	Entrepreneurship Education	college student, big data, innovation and entrepreneurship, colleges and universities, university students, computer science, integration, innovation and entrepreneurship education, computer programming, science and technology	4641
5	Purple	Start-Up	technology transfer, research, research and development, venture capital, patents and inventions, commercialization, open innovation, intellectual property, biotechnology, reactor startup	3224
6	Light Blue	Social Entrepreneur	social entrepreneur, social impact, social problems	367
7	Orange	Managers		868

Editorials				
Cluster	**Color**	**Name**	**Keywords**	**Total Link Strength**
1	Blue	Entrepreneurship	editorial, human, commercial phenomena, united states, priority journal, leadership, investment, biotechnology, economics, research	1764
2	Green	Performance	innovation, firm, knowledge, opportunity, capability, network, market, internationalization, resources, venture	604
3	Yellow	Management	business, impact, perspective, education, field, framework, creation, orientation, future, system	385
4	Red	Organization	strategy, governance, policy, entrepreneur, institutions, context, government, politics, corporate social responsibility, environment	301
5	Purple	Model	growth, behavior, work, ownership, development, family business, agency, corporate governance, cost, socioemotional wealth	243
6	Light Blue	Technology	sustainability, creativity, design, covid-19, resilience, stakeholder, business model, art, entrepreneurial ecosystem, business model innovation	241
7	Orange	Industry	artificial intelligence, mobile robots, robotics, robot design, autonomous	146
8	Brown	Organzation and Management	united kingdom, nurse, awards and prizes, decision making, standard, psychological aspect, job satisfaction, private practice	130
9	Pink	Entrepreneurial	employment, competence, learning, emotion, self employment, experience,	86

Source: Own Elaboration

The co-occurrence network analysis reveals notable differences between document types, highlighting shifts in focus and emerging trends in entrepreneurship research presented in Figure 9. Articles primarily center on well-established business and management themes, with entrepreneurship, performance, and firm as core topics.

Figure 9: Network Visualization per Document Type



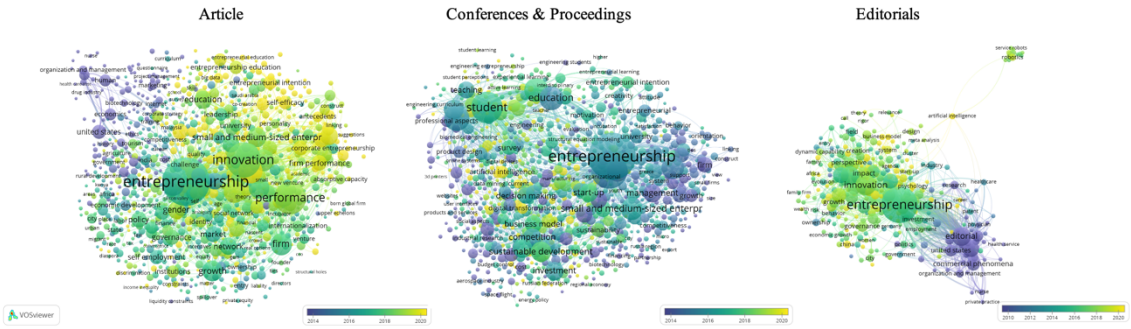
Source: VOSviewer

However, the presence of distinct clusters around impact, technology, and sustainable entrepreneurship suggests that change-related themes have become an integral part of entrepreneurship literature. Conference proceedings, in contrast, emphasize entrepreneurship as a main cluster but show a strong focus on education, social, and sustainable development, alongside a progressive Start-Up cluster featuring biotechnology, big data, and technology transfer. Editorials focus on structural and operational aspects of entrepreneurship, with core clusters on entrepreneurship, performance, management, organization, and models, but also include emerging topics such as AI, robotics, resilience, and COVID-19, suggesting that editorials might

anticipate new research directions, while articles consolidate established knowledge, and conferences serve as a space for interdisciplinary and applied discussions.

The overlay visualizations in Figure 10 highlight temporal differences in research evolution across document types. Articles show a gradual shift, with entrepreneurship, policy, and firms peaking in 2017, followed by innovation, performance, and education (2018), and sustainability, digital transformation, and COVID-19 emerging in 2020–2022. Conferences & Proceedings take a more forward-looking approach, with entrepreneurship and education dominating early (2014–2016), shifting to sustainability and ecosystems (2018), and leading in AI and digital finance (2022–2024). Editorials cover the longest time span, featuring early discussions on entrepreneurship (2010), industry and innovation (2018), and sustainability, AI, and circular economy (post-2020), suggesting they anticipate trends before they become well-established in articles.

Figure 10: Overlay Visualization per Document Type



Source: VOSviewer

The density visualizations, presented in Figure 11, reveal distinct research structures across document types. Articles show a broad, well-connected network with entrepreneurship, innovation, and performance as central hotspots, while structural holes remain isolated, indicating a theoretical but less mainstream niche. Conferences & Proceedings have a highly concentrated core around entrepreneurship and innovation, with strong emphasis on education, start-ups, and sustainability, reflecting a more focused, applied research agenda. Editorials highlight emerging but fragmented themes, with entrepreneurship central, yet AI, robotics, and healthcare appearing isolated, suggesting early discussion of trends before full integration into mainstream research.

Figure 11: Density Visualization per Document Type

Source: VOSviewer

5.4.2 Per Journal Category

For the business/management dataset, a total of 985 keywords met the threshold value of 17 and were divided into 7 clusters.[11] Within the economics dataset, 793 keywords met the threshold of 5 minimum occurrences and were grouped into 8 clusters. A total of 363 keywords met the threshold of 5 minimum occurrences within the engineering dataset and were divided into 8 clusters. In entrepreneurship, we set a threshold of 9 to receive 957 keywords grouped into 7 clusters. Within the environmental sciences dataset, 862 keywords meet the threshold of 6 minimum occurrences, divided into 8 clusters. Within the finance dataset, 164 keywords meet the threshold of 5 and are then grouped into 9 clusters. 204 keywords meet the threshold of 5 within the marketing dataset. The keywords are grouped into 6 clusters. Amongst the social sciences dataset, 511 keywords meet the threshold of 5 minimum occurrences and are grouped into 7 clusters.

The keyword analysis across journal categories highlights entrepreneurship, innovation, and performance as central themes across disciplines, with varying emphases. Business/Management focuses on firm strategy and dynamics, while Economics takes a macroeconomic view, emphasizing growth, policy, and self-employment. Engineering prioritizes technology transfer and commercialization, whereas Entrepreneurship blends business with social dimensions like networks and gender. Environmental Sciences integrate sustainability and social entrepreneurship, while Finance centers on investment mechanisms. Marketing links entrepreneurship to capability and strategy, and Social Sciences emphasize governance, rural entrepreneurship, and societal impact. A key

[11] These thresholds were adjusted dynamically to keep the total number of keywords per network below 1,000, preventing overcrowding and preserving the interpretability of thematic clusters.

contrast emerges between technology and finance-driven perspectives versus social and environmental concerns, illustrating the field's interdisciplinary scope. For a more fine-grained analysis as well as the cluster table, a detailed description, and visualizations, we point towards the *Online Appendix O-5.4.2a-b* and *Appendix A-5.4.2a-c.*

5.5 Thematic Mapping and Evolution

To trace the evolution of the discipline over time, we performed a thematic mapping analysis in *Biblioshiny*. Co-occurrence analysis identifies keyword relationships based on their frequency of appearing together in documents, forming the foundation for thematic mapping, which categorizes these keyword clusters by their relevance (centrality) and development (density) within the research field to reveal structural and evolutionary trends. Strategic diagrams provide a visual representation of research priorities, making it possible to track the evolution of key concepts over time. Some clusters remain stable across different periods, indicating continuity in entrepreneurship research, while shifts in centrality and density highlight emerging trends and evolving areas of focus. To ensure the integrity of the bibliographic dataset, we merged the authors' keywords and indexed keywords in RStudio, deduplicated the results, and standardized synonyms. We then divided the dataset into 12 time slices to analyze and compare thematic clusters across different periods. Considering the annual volume of scientific output, we used 10-year intervals until 2000 and 3-year intervals from 2001 onward.[12] In the *Online Appendix O-5.5* we describe the mathematical and algorithmic procedure for thematic mapping.

Table 10 presents an overview of the thematic evolution. Entrepreneurship research has undergone a significant transformation, evolving from a primarily economic and industrial focus in the 1960s–1980s into a multidimensional and interdisciplinary field in the 2000s–2020s. While entrepreneurship, innovation, and firm growth have remained core themes, recent research has expanded to include digitalization, sustainability, policy, and gender dynamics. The longitudinal analysis of research themes highlights the evolution from broad economic and industrial concerns to more specialized and interconnected topics. Entrepreneurship became a dominant research theme in the 1990s,

[12] 1961–1970, 1971–1980, 1981–1990, 1991–2000, 2001–2003, 2004–2006, 2007–2009, 2010–2012, 2013–2015, 2016–2018, 2019–2021, and 2022–2025 (1950-1960 (73 records) was disregarded, since only one row included keywords)

integrating policy, education, and innovation. By the 2000s, the field diversified, incorporating biotechnology, marketing, and investment alongside traditional business studies. Since 2010, research has increasingly focused on digital transformation, sustainability, and governance, with entrepreneurial ecosystems, start-ups, and social entrepreneurship gaining traction. The most recent period (2022–2025) emphasizes firm strategy, dynamic capabilities, gender, and policy, while education and behavioral aspects of entrepreneurship remain debated, possibly indicating an emerging or declining focus.

Table 10: Cluster Overview Thematic Evolution

Period	Motor Themes	Basic Themes	Niche Themes	Emerging/Declining Themes
1961–1970				Motivation
1971–1980	Methodology Schools, Medical Animal	Industrial Management Manufacturing Brazil Nineteenth Century	Prevention Central Nervous System Labor	Industrial Management Technological Forecasting STEM Environmental Health Canada Operations Research
1981–1990	Developing Country Innovation	Economics Industrial Management	Entrepreneur Industrial Economics Emerging Education	Paper and Pulp Mills Papermaking Machinery
1991–2000	Entrepreneurship Economics Innovation STEM	Management Innovation Marketing Developing Country	Paper and Pulp Mills STEM Small Firm Self Employment	Entrepreneur Companies Information
2001–2003	Entrepreneurship	Investment	Paper and Pulp Mills	Entrepreneur
2004–2006	Entrepreneurship	Marketing	Identity	Marketing Eurasia Identity
2007–2009	Entrepreneurship Entrepreneur	Entrepreneur	Entrepreneur	Entrepreneur
2010–2012	Entrepreneurship Performance Entrepreneur	Innovation Entrepreneur Entrepreneurialism Education	Field Business Development	Entrepreneurialism Economics Entrepreneurial Education
2013–2015	Entrepreneurship	Entrepreneur	Human	Education
2016–2018	Entrepreneurship Innovation			Education Human
2019–2021	Entrepreneurship Innovation		Innovation	Education
2022–2025	Entrepreneurship Firm	Entrepreneurship Policy	Human	Gender Policy

Source: Own Elaboration

This long-term shift reflects entrepreneurship's transformation from a business-centric subject into a highly interdisciplinary, policy-driven, and technology-integrated research domain. Earlier research (1960s–1980s) was rooted in economics, industrial management, and public health, with entrepreneurship playing a minor role. The 2000s

saw diversification, adding education, investment, and biotechnology, while since 2010, digitalization, sustainability, and entrepreneurial ecosystems have gained prominence. The latest research (2022–2025) places a stronger emphasis on gender and policy, illustrating the field's continued adaptation to societal and technological shifts.

5.6 Take-Off Analysis of Recent Trends

The economic impact of innovation arises not from its introduction, but from its diffusion—an idea emphasized by Schumpeter (1942), Rogers (1962), and Griliches (1957, 1992). This principle also applies to academic research trends. In the entrepreneurship literature, topics such as Social Entrepreneurship, Family Business, and High-Tech Entrepreneurship gain significance through dissemination and adoption. To analyze this process, we apply Take-off Analysis (Chandrasekaran and Tellis, 2008), originally developed to identify when a new technology or product reaches a critical threshold leading to rapid adoption and exponential growth. We apply this concept to entrepreneurship research trends.

We examine recent trends identified in our previous analyses (keywords, bigrams, trigrams, co-occurrence, thematic mapping, thematic evolution) to understand their origins and dissemination. Our objectives include fitting a growth curve to annual keyword frequency, identifying the first article introducing the keyword, and analyzing their author, affiliation, journal, and country. We then determine the take-off point—where keyword adoption accelerates—and identify key articles from the preceding two years that contributed to dissemination. The detailed documentation is presented in *Appendix A-5.*6.

We focus on five prominent trends: Social Entrepreneurship, Family Business, Sustainable Entrepreneurship, International Entrepreneurship, and High-Tech Entrepreneurship. These trends exhibit slow initial growth, followed by an inflection point where adoption surges. To identify this take-off point, we fit a growth model to historical keyword usage data and pinpoint the moment of maximum acceleration. Articles published in the two years before this point are assumed to have driven the take-off. We analyze these works based on citations, authors, affiliations, and publication venues to shed light on the dissemination process.

Across all five trends, a clear pattern emerges: new topics first appear in abstracts, later titles, and are often indexed before becoming author keywords—suggesting researchers align with journal classifications rather than self-defining new terms. Interestingly, most trend-originating articles are not published in leading journals and receive relatively low citations (avg. 22, highly skewed distribution). Geographically, most originate from English-speaking countries, mainly the US, followed by the UK, Canada, and Australia, but Ivy League involvement is minimal. This suggests that while US-based scholars drive entrepreneurship trends, they are not necessarily pioneered by top-tier universities. Furthermore, many trends emerge from fields outside traditional management or economics, including social sciences, computer science, and engineering, with entrepreneurship journals only recently contributing to trend origins.

The dissemination of these trends follows a distinct pattern, with a noticeable take-off point where keyword usage significantly increases. Prior to this point, key articles played a crucial role in establishing and amplifying the trend. The most cited articles in the two years leading up to the take-off point tend to be published in leading journals, authored by researchers from top institutions and often written by recognized scholars in the field. This suggests that while new trends may emerge in diverse academic spaces, their wider adoption and legitimacy are typically driven by high-impact publications and established academic networks.

In sum, research trends in Entrepreneurship have multiple roots across disciplines and are often inspired by individuals not working in Ivy League, but US universities and not published in the leading journals of the field. However, to disseminate ideas and trends, it seems like that a leading scholar, institution, and or journal has to set the tone for the trend.

6. CONCLUSION

This study analyses 75 years of entrepreneurship research from Web of Science and Scopus and identifies how key sub-themes have emerged, evolved, or faded. Using keyword co-occurrence analysis, we identify dominant themes and their development across disciplines, document types, and research trends.

Our results of the *performance analyses* show that research on entrepreneurship has grown exponentially (AAGR >13%), outperforming other business & economics fields (AAGR 3-7%), with exponential growth peaking in 2020, followed by a slight decline in the AAGR of publications referencing *Entrepreneurship*. While business, management, and economics dominate, engineering, computer science, marketing, and environmental sciences show faster growth, with environmental sciences having the highest AAGR over the last decade. Within the full dataset of 200,631 records, research articles (64%) are the primary publication format, followed by conferences & proceedings (15%) and editorials (5%),[13] with 94% of publications in English.

The journals whose articles gather most citations are the *Journal of Business Venturing*, *Small Business Economics*, and *Entrepreneurship Theory and Practice*. It was found that high-output institutions do not necessarily have the highest citation impact, highlighting differences in quantity vs. influence. The most cited research is mainly driven by institutions and authors based in the US and the UK. The UK, Canada, and Germany have strong research links with the US, while China produces a high volume of publications but is not yet among the top three most cited countries. However, its growing presence signals a potential shift in the predominantly Western research landscape.

Our results from *keyword analyses* show that, over time, the most popular keywords are entrepreneurship, innovation, sustainability, social entrepreneurship, performance, and impact. A key cluster of terms related to entrepreneurship, management, innovation, performance, and strategy remains relevant across time, mirroring the early definitions of the entrepreneur. Although the major keywords occur frequently across disciplines, we do see a field-specific differentiation of keywords, reflecting their specific interests. In Business & Management, Economics, and Engineering, a more specific focus is given to work on social entrepreneurship, business model innovation, self-employment, gender,

[13] The remaining 16% are other document types such as books, book chapters, reviews, and others.

and technology transfer. In environmental sciences, there is a specific focus on sustainability, sustainable development, circular economy, and sustainable entrepreneurship. While some keywords such as entrepreneurship, innovation or performance remain important over time, other keywords such as social media, crowdfunding, Covid-19, digital transformation, or circular economy emerged surprisingly quickly at one point in time and then showed a strong burst.

Early bigrams in entrepreneurship research included Entrepreneurial Leadership, Economic Growth, and Entrepreneurial Behavior. In the 1980s and 1990s, Venture Capital and Health Care dominated, while in recent years, Entrepreneurial Orientation, Business Model, Entrepreneurship Education, and Entrepreneurial Intention have gained prominence. Fast-growing bigrams include Artificial Intelligence (peaks in 2008/09, 2017), Social Entrepreneurship (1999), Circular Economy (2017) and Covid Pandemic (2019). The most common bigrams across all periods are Covid Pandemic, Entrepreneurial Intention, Business Model and Entrepreneurial Orientation.

Trigram trends reflect shifts in focus: finance-related terms (Venture Capital Financing) dominated in the 1980s-90s, digitalization (Digital Business Model) rose from 2010, and sustainability (Sustainable Development Goals) surged from 2015. The most common trigram in 2024 is Corporate Social Responsibility. Interestingly, Paper and Pulp were a very strong keyword up until 2003, but almost disappeared afterward.

Overall, the evolution of keywords highlights the diversification of entrepreneurship into different subfields, including social entrepreneurship, ethics, immigration, family businesses, well-being and technology.

The *co-occurrence analysis* of keywords across document types and journal categories reveals distinct thematic structures in entrepreneurship research. Articles focus on established business and management themes, incorporating innovation, performance, and sustainability. Conferences & proceedings emphasize education, social entrepreneurship, and start-ups, while editorials explore emerging topics like AI, robotics, and resilience, suggesting they anticipate trends before they gain widespread academic attention. Across journal categories, business and management studies highlight firm strategy, economics explores policy and self-employment, and engineering focuses on technology transfer and commercialization. Environmental sciences integrate

sustainability, finance centers on investment mechanisms, marketing links entrepreneurship to capability and strategy, and social sciences emphasize governance and societal impact. The contrast between technology- and finance-driven perspectives versus social and environmental concerns underscores the interdisciplinary nature of entrepreneurship research, shaping its future trajectory.

Concerning the thematic evolution, our results from *thematic mapping* show: Entrepreneurship research has evolved from early socio-economic foundations to a highly interdisciplinary field, integrating themes of innovation, firm performance, education, sustainability, and policy. Over time, the focus has shifted from basic economic and industrial discussions to strategic business models, entrepreneurial ecosystems, and governance structures. While innovation and firm performance remain central, emerging themes like entrepreneurial orientation, self-efficacy, and digital transformation indicate a growing emphasis on adaptability and long-term impact. The increasing influence of sustainability, gender, and entrepreneurial education suggests that future research will continue expanding beyond traditional business domains. As the field matures, new directions will likely explore AI-driven entrepreneurship, digital ecosystems, and social innovation, further solidifying entrepreneurship as a dynamic and evolving field of research.

Our results from the *take-off analyses* and *trend development* show a clear pattern of new trends being first mentioned in the abstract, then become part of the title of research articles. In 2/3 of all discovered and analyzed trends, they were indexed before they were used as author keywords. This indicates that researchers follow categories that journals suggest. We further found out that most articles are not published in the leading journals of the fields and even if they are published there, their citation count is very low with an average of 22 citations (in a strongly skewed distribution). US universities dominate, with few contributions from Ivy League schools, suggesting that trends originate outside elite institutions. Almost all trends have their origin in traditional management or economics journals, or to a lower amount in the social sciences and computer sciences. This can be explained due to the relatively young age of entrepreneurship journals.

7. DISCUSSION

In order to contribute to a thorough knowledge of the conceptual framework and thematic development of the discipline, this thesis sought to present a comprehensive analysis of the whole literature on entrepreneurship. In order to determine how certain subtopics have changed, persisted, and vanished as well as which trends have surfaced in recent years, it compiles and examines 75 years of entrepreneurial literature. In order to understand the emergence of both definitions and themes into a chronological order, we conduct a bibliometric analysis, in accordance with the significance of examining historical data to follow intellectual pathways in entrepreneurship research and put thematic development into context (Wadhwani and Jones, 2014).

We wanted to learn more about the field's history, current and emerging trends, unresolved issues in the literature, and how the diverse and multifaceted field's subtopics differ from one another. By doing this, we want to fill the following gaps in the entrepreneurial field and contribute as follows: Quantitative bibliometric studies that examine the entire field of entrepreneurship in a broad sense (1st gap) over an extended period of time (2nd gap), incorporate all significant publications about entrepreneurship (3rd gap), compare developments and trends in entrepreneurship research (4th gap) across various article types (5th gap) and examine the various disciplines that contribute to the field (6th gap) are lacking. Though it has largely concentrated on subtopics like social entrepreneurship, entrepreneurial organisations, or ethics in entrepreneurship, which are further covered in the literature section of this study, prior research on the field's development offers insights into a portion of the literature. Additionally, they typically only looked at one database, either Web of Science or Scopus (7th gap), and they worked with small sets of analysis (an average of 1,500 documents).

What we learned from the results of our bibliometric study we showed in the last chapter on results. To put these results into a critical discussion and reflection: The historical development of the field shows a clear thematic evolution (see Table 10) that reflects and supports out results from the literature review where early definitions of scholars primarily focused on the individual, the entrepreneur, and it’s characterizations. Only roughly two decades later entrepreneurship becomes a central theme itself alongside other driving themes like economics and innovation. The thematic evolution shows the

emergence and justifies the existence of the diverse thematic streams found in today's entrepreneurship resarch. It is evident from the cluster analysis and keyword evolution that former subtopics have developed into distinct research communities, influencing both the field's richness and fragmentation at the same time.

We see a clear pattern on how themes in entrepreneurship research develop. New impulses usually originate from conferences, editorials set the trends, before they become widely accepted by peer-reviewed journals. The overlay visualization by document type (see Figure 10) visualizes this delay between trend formation and academic diffusion. Notably, several significant trends, like sustainable entrepreneurship or family and entrepreneurship, initially appeared outside of entrepreneurship journals and were initiated by academics from related fields. This demonstrates that ideas from outside influence the field, but also raises doubts about the academic independence and the ability of it's core institutions to shape their own research agenda.

The analysis of the journal categories supports the findings in our literature review that entrepreneurship is a multidisciplinary field influenced by disciplines like economics, environmental sciences, and finance. Although this multidisciplinary approach promotes methodological diversity and practical applicability, it further leads to fragmentation and the creation of substreams. While this decentralization allows for innovation and inclusivity, it also makes it more difficult for entrepreneurship to strengthen it's theoretical core and be perceived as an independent academic discipline rather than a musltidisciplinary field.

The literature review in Chapter 2 demonstrated the incredibly diverse and heterogeneous character of research on the multidisciplinary field of entrepreneurship. We highlighted recent perceived strengths and weaknesses of the discipline. By providing evidence of the field's conceptual structure and thematic evolution, the results of the bibliometric study validates and builds upon these ideas. Our results answer central open questions from the literature on the development, heterogeneity and thematic structure of entrepreneurship research. The historical perspective and bibliometric analysis provide valuable insights into the dynamic but also fragmented growth of the field.

8. FUTURE RESEARCH

While heterogeneity in entrepreneurship has enabled innovation and theoretical development, it has also created fragmentation and a lack of disciplinary legitimacy. Moving forward, the field could benefit from developing stronger theoretical anchors, embracing historical and longitudinal perspectives, clarifying core concepts and boundaries, or encouraging synthesis across research streams. Such efforts can strengthen entrepreneurship's claim as a mature academic discipline with both scientific rigor and societal relevance.

The results presented in this dissertation provide a thorough, data-driven overview of entrepreneurship research, serving as foundational work for further studies. It facilitates the identification of neglected aread, thematic imalances, and rising trends.

The results further contribute important findings regarding the origin and dissemination of trends in entrepreneurship literature. Future research should further investigate about journal hierarchies and the spread of innovative ideas, for instance, given the surprising impact of less known authors and journals on high-impact trends. The take-off concept is an interesting approach to study the diffusion of trends in the field. Further research could generalize these findings through a longitudinal analysis of these effects.

Deeper research into academic gatekeeping and the geopolitics of knowledge production would be of high value, as the results reveal the predominance of US based institutions and the role of prominent journals in trend dissemination. This invites future research not only on the sociology of the field but also on finding methods that promote greater inclusion and diversity in scholarly publishing.

Lastly, this work paves the way for further methodological developments, such as extending the take-off analysis to more precisely predict research frontiers.

9. LIMITATIONS OF THE STUDY

Despite the rigorous methodological approach, this study has several limitations that should be acknowledged. First, the study relies on bibliometric data from Web of Science and Scopus, which, while comprehensive, may still exclude relevant publications from other databases such as Google Scholar or Dimensions. Furthermore, the predefined keyword list, while validated through expert surveys and pre-tests, may still lead to selection bias, either by omitting relevant studies that use alternative terminology or by including unrelated works due to ambiguous keyword matches.

The data cleaning and merging process involved extensive manual intervention, making it susceptible to errors. Although automated deduplication was applied, a few thousand duplicates had to be removed manually as well as some discrepancies in metadata structures required additional manual adjustments, which may have introduced unintended biases or inconsistencies in the dataset. Computational limitations also restricted software choices, preventing the use of automated citation burst detection in CiteSpace or Sci2, requiring manual analysis instead.

Additionally, the final solutions in this study depend partly on technical decisions made by the authors, such as the selection of clustering algorithms, threshold values, and normalization techniques. While we aimed to use well-established methods, different algorithmic choices could yield slightly different thematic structures. Even though we validated our assumptions wherever possible, this study remains subject to personal choices and methodological decisions, influencing aspects such as keyword selection, database inclusion, and filtering criteria.

Finally, the exclusion of non-English publications and certain document types, such as book chapters or grey literature, may limit the comprehensiveness of the findings. The focus on journal articles, conference proceedings, and editorials ensures that the analysis is based on peer-reviewed sources but may overlook significant contributions from emerging or interdisciplinary research fields. Despite these limitations, the study provides a valuable large-scale perspective on the evolution of entrepreneurship research.

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APPENDICES

A-5.2.1 Top 10 Most Cited Documents

Articles

Rank	Paper	Author	PY	TC	C / Y	Journal
1	USER ACCEPTANCE OF INFORMATION TECHNOLOGY: TOWARD A UNIFIED VIEW	VENKATESH VISWANATH; MORRIS MICHAEL G.; DAVIS GORDON B.; DAVIS FRED D.	2003	26548	1,154.26	MIS QUARTERLY: MANAGEMENT INFORMATION SYSTEMS
2	THE PROMISE OF ENTREPRENEURSHIP AS A FIELD OF RESEARCH	SHANE S;VENKATARAMAN S	2000	6600	253.85	ACADEMY OF MANAGEMENT REVIEW
3	SOCIAL STRUCTURE AND COMPETITION IN INTERFIRM NETWORKS: THE PARADOX OF EMBEDDEDNESS	UZZI BRIAN	1997	5512	190.07	ADMINISTRATIVE SCIENCE QUARTERLY
4	CLUSTERS AND THE NEW ECONOMICS OF COMPETITION.	PORTER MICHAEL	1998	5385	192.32	HARVARD BUSINESS REVIEW
5	MANAGEMENT OWNERSHIP AND MARKET VALUATION. AN EMPIRICAL ANALYSIS	MORCK RANDALL;SHLEIFER ANDREI;VISHNY ROBERT W.	1988	4043	106.39	JOURNAL OF FINANCIAL ECONOMICS
6	STRATEGIC MANAGEMENT OF SMALL FIRMS IN HOSTILE AND BENIGN ENVIRONMENTS	COVIN JEFFREY G;SLEVIN DENNIS P.	1989	3835	103.65	STRATEGIC MANAGEMENT JOURNAL
7	FROM MANAGERIALISM TO ENTREPRENEURIALISM - THE TRANSFORMATION IN URBAN GOVERNANCE IN LATE CAPITALISM	HARVEY D	1989	3290	88.92	GEOGRAFISKA ANNALER SERIES B-HUMAN GEOGRAPHY
8	CAUSATION AND EFFECTUATION: TOWARD A THEORETICAL SHIFT FROM ECONOMIC INEVITABILITY TO ENTREPRENEURIAL CONTINGENCY	SARASVATHY SD	2001	2954	118.16	ACADEMY OF MANAGEMENT REVIEW
9	THE CORRELATES OF ENTREPRENEURSHIP IN 3 TYPES OF FIRMS	MILLER D	1983	2862	66.56	MANAGEMENT SCIENCE
10	COMPETING MODELS OF ENTREPRENEURIAL INTENTIONS	KRUEGER NF;REILLY MD;CARSRUD AL	2000	2791	107.35	JOURNAL OF BUSINESS VENTURING

Conferences & Proceedings

Rank	Paper	Author	PY	TC	C / Y	Journal
1	DOING MORE WITH LESS: INNOVATION INPUT AND OUTPUT IN FAMILY FIRMS	DURAN, PATRICIO ; KAMMERLANDER, NADINE ; VAN ESSEN, MARC ; ZELLWEGER, THOMAS	2016	647	64.70	ACADEMY OF MANAGEMENT JOURNAL
2	ADDITIVE MANUFACTURING: A FRAMEWORK FOR IMPLEMENTATION	MELLOR, STEPHEN ; HAO, LIANG ; ZHANG, DAVID	2014	638	53.17	INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS
3	BUSINESS MODEL INNOVATION: TOWARDS AN INTEGRATED FUTURE RESEARCH AGENDA	SCHNEIDER, SABRINA ; SPIETH, PATRICK	2013	504	38.77	INTERNATIONAL JOURNAL OF INNOVATION MANAGEMENT
4	THE EFFECT OF FAMILY CONTROL ON FIRM VALUE AND PERFORMANCE: EVIDENCE FROM CONTINENTAL EUROPE	BARONTINI, ROBERTO ; CAPRIO, LORENZO	2006	399	19.95	EUROPEAN FINANCIAL MANAGEMENT
5	SOCIAL ENTREPRENEURSHIP: HOW INTENTIONS TO CREATE A SOCIAL VENTURE ARE FORMED	MAIR JOHANNA;NOBOA ERNESTO	2006	382	19.10	SOCIAL ENTREPRENEURSHIP-BOOK
6	ASSESSING AND MANAGING THE UNIVERSITY TECHNOLOGY BUSINESS INCUBATOR: AN INTEGRATIVE FRAMEWORK	MIAN, SARFRAZ A.	1997	336	11.59	JOURNAL OF BUSINESS VENTURING
7	A THEORY OF SMART CITIES	HARRISON, COLIN ; DONNELLY, IAN ABBOTT	2011	309	20.60	55TH ANNUAL MEETING OF THE INTERNATIONAL SOCIETY FOR THE SYSTEMS SCIENCES 2011
8	HOW THE INDUSTRIAL INTERNET OF THINGS CHANGES BUSINESS MODELS IN DIFFERENT MANUFACTURING INDUSTRIES	ARNOLD, CHRISTIAN ; KIEL, DANIEL ; VOIGT, KAI-INGO	2016	294	29.40	INTERNATIONAL JOURNAL OF INNOVATION MANAGEMENT
9	THE KUKA-DLR LIGHTWEIGHT ROBOT ARM - A NEW REFERENCE PLATFORM FOR ROBOTICS RESEARCH AND MANUFACTURING	BISCHOFF, RAINER ; KURTH, JOHANNES ; SCHREIBER, GÜNTER ; KOEPPE, RALF ; ALBU-SCHÄFFER, ALIN ; BEYER, ALEXANDER ; EIBERGER, OLIVER ; HADDADIN, SAMI ; STEMMER, ANDREAS ; GRUNWALD, GERHARD ; HIRZINGER, GERHARD	2010	279	17.44	JOINT 41ST INTERNATIONAL SYMPOSIUM ON ROBOTICS AND 6TH GERMAN CONFERENCE ON ROBOTICS 2010, ISR/ROBOTIK 2010
10	CREDIT CONSTRAINTS AS A BARRIER TO THE ENTRY AND POST-ENTRY GROWTH OF FIRMS	AGHION, PHILIPPE ; FALLY, THIBAULT ; SCARPETTA, STEFANO	2007	263	13.84	ECONOMIC POLICY

Editorials

Rank	Paper	Author	PY	TC	C / Y	Journal
1	THE FUTURE OF RESOURCE-BASED THEORY: REVITALIZATION OR DECLINE?	BARNEY JAY B;KETCHEN JR DAVID J;WRIGHT MIKE	2011	908	60.53	JOURNAL OF MANAGEMENT
2	GUEST EDITORS' INTRODUCTION TO THE SPECIAL ISSUE - STRATEGIC ENTREPRENEURSHIP: ENTREPRENEURIAL STRATEGIES FOR WEALTH CREATION	HITT MA;IRELAND RD;CAMP SM;SEXTON DL	2001	855	34.20	STRATEGIC MANAGEMENT JOURNAL
3	INSTITUTIONAL ENTREPRENEURSHIP AS EMBEDDED AGENCY: AN INTRODUCTION TO THE SPECIAL ISSUE	GARUD RAGHU;HARDY CYNTHIA;MAGUIRE STEVE	2007	720	37.89	ORGANIZATION STUDIES
4	BUSINESS MODELS FOR SUSTAINABILITY: ORIGINS, PRESENT RESEARCH, AND FUTURE AVENUES	SCHALTEGGER STEFAN;HANSEN ERIK G;LUEDEKE-FREUND FLORIAN	2016	706	70.60	ORGANIZATION AND ENVIRONMENT
5	CORPORATE ENTREPRENEURSHIP - INTRODUCTION	GUTH WD;GINSBERG A	1990	604	16.78	STRATEGIC MANAGEMENT JOURNAL
6	INTRODUCTION TO THE SPECIAL ISSUE SOCIAL COMMERCE: A RESEARCH FRAMEWORK FOR SOCIAL COMMERCE	LIANG TING-PENG;TURBAN EFRAIM	2011	517	34.47	INTERNATIONAL JOURNAL OF ELECTRONIC COMMERCE
7	ENTREPRENEURING AS EMANCIPATION	RINDOVA VIOLINA;BARRY DAVED;KETCHEN JR DAVID J	2009	502	29.53	ACADEMY OF MANAGEMENT REVIEW
8	PATH DEPENDENCE OR PATH CREATION?	GARUD RAGHU;KUMARASWAMY ARUN;KARNOE PETER	2010	475	29.69	JOURNAL OF MANAGEMENT STUDIES
9	NEW FINANCIAL ALTERNATIVES IN SEEDING ENTREPRENEURSHIP: MICROFINANCE, CROWDFUNDING, AND PEER-TO-PEER INNOVATIONS	BRUTON GARRY;KHAVUL SUSANNA;SIEGEL DONALD;WRIGHT MIKE	2015	459	41.73	ENTREPRENEURSHIP THEORY AND PRACTICE
10	SCIENCE PARKS AND INCUBATORS: OBSERVATIONS, SYNTHESIS AND FUTURE RESEARCH	PHAN PH;SIEGEL DS;WRIGHT M	2005	458	21.81	JOURNAL OF BUSINESS VENTURING

Source: Own Elaboration

PY = Publication Year, TC = Total Citations, C / Y = Citations per Year

A-5.2.2a Top 10 Most Cited Documents

Rank	Paper	Author	PY	TC	C / Y	Journal
		Business/Management				
1	THE PROMISE OF ENTREPRENEURSHIP AS A FIELD OF RESEARCH	SHANE S;VENKATARAMAN S	2000	6600	253.85	ACADEMY OF MANAGEMENT REVIEW
2	CLUSTERS AND THE NEW ECONOMICS OF COMPETITION.	PORTER, M.E.	1998	5385	192.32	HARVARD BUSINESS REVIEW
3	STRATEGIC MANAGEMENT OF SMALL FIRMS IN HOSTILE AND BENIGN ENVIRONMENTS	COVIN, JEFFREY G. ; SLEVIN, DENNIS P.	1989	3835	103.65	STRATEGIC MANAGEMENT JOURNAL
4	CAUSATION AND EFFECTUATION: TOWARD A THEORETICAL SHIFT FROM ECONOMIC INEVITABILITY TO ENTREPRENEURIAL CONTINGENCY	SARASVATHY SD	2001	2954	118.16	ACADEMY OF MANAGEMENT REVIEW
5	THE CORRELATES OF ENTREPRENEURSHIP IN 3 TYPES OF FIRMS	MILLER D	1983	2862	66.56	MANAGEMENT SCIENCE
6	COMPETING MODELS OF ENTREPRENEURIAL INTENTIONS	KRUEGER NF;REILLY MD;CARSRUD AL	2000	2791	107.35	JOURNAL OF BUSINESS VENTURING
7	INITIAL TRUST FORMATION IN NEW ORGANIZATIONAL RELATIONSHIPS	MCKNIGHT, D. HARRISON ; CUMMINGS, LARRY L. ; CHERVANY, NORMAN L.	1998	2719	97.11	ACADEMY OF MANAGEMENT REVIEW
8	OF STRATEGIES, DELIBERATE AND EMERGENT	MINTZBERG, HENRY ; WATERS, JAMES A.	1985	2668	65.07	STRATEGIC MANAGEMENT JOURNAL
9	VALUE CREATION IN E-BUSINESS	AMIT R;ZOTT C	2001	2567	102.68	STRATEGIC MANAGEMENT JOURNAL
10	BUSINESS MODEL INNOVATION: OPPORTUNITIES AND BARRIERS	CHESBROUGH, HENRY	2010	2519	157.44	LONG RANGE PLANNING
		Economics				
Rank	**Paper**	**Author**	**PY**	**TC**	**C / Y**	**Journal**
1	THE REGULATION OF ENTRY	DJANKOV, SIMEON ; LA PORTA, RAFAEL ; LOPEZ-DE-SILANES, FLORENCIO ; SHLEIFER, ANDREI	2002	2152	89.67	QUARTERLY JOURNAL OF ECONOMICS
2	ON THE NATURE, FUNCTION AND COMPOSITION OF TECHNOLOGICAL SYSTEMS	CARLSSON, B. ; STANKIEWICZ, R.	1991	1247	35.63	JOURNAL OF EVOLUTIONARY ECONOMICS
3	THE KNOWLEDGE SPILLOVER THEORY OF ENTREPRENEURSHIP	ACS ZOLTAN J;BRAUNERHJELM PONTUS;AUDRETSCH DAVID B; CARLSSON BO	2009	1190	70.00	SMALL BUSINESS ECONOMICS
4	POLITICAL CONNECTIONS, FINANCING AND FIRM PERFORMANCE: EVIDENCE FROM CHINESE PRIVATE FIRMS	LI HONGBIN;MENG LINGSHENG;WANG QIAN;ZHOU LI-AN	2008	1086	60.33	JOURNAL OF DEVELOPMENT ECONOMICS
5	GLOBAL ENTREPRENEURSHIP MONITOR: DATA COLLECTION DESIGN AND IMPLEMENTATION 1998-2003	REYNOLDS P;BOSMA N;AUTIO E;HUNT S;DE BONO N; SERVAIS I;LOPEZ-GARCIA P;CHIN N	2005	1032	49.14	SMALL BUSINESS ECONOMICS
6	COMPETITION, COOPERATION, AND INNOVATION. ORGANIZATIONAL ARRANGEMENTS FOR REGIMES OF RAPID TECHNOLOGICAL PROGRESS	TEECE, DAVID J.	1992	995	29.26	JOURNAL OF ECONOMIC BEHAVIOR AND ORGANIZATION
7	PERCEPTUAL VARIABLES AND NASCENT ENTREPRENEURSHIP	ARENIUS P;MINNITI M	2005	958	45.62	SMALL BUSINESS ECONOMICS
8	ON THE ORIGINS OF GENDER ROLES: WOMEN AND THE PLOUGH	ALESINA ALBERTO;GIULIANO PAOLA;NUNN NATHAN	2013	844	64.92	QUARTERLY JOURNAL OF ECONOMICS
9	GROWING LIKE CHINA	SONG ZHENG;STORESLETTEN KJETIL;ZILIBOTTI FABRIZIO	2011	839	55.93	AMERICAN ECONOMIC REVIEW
10	EFFECTS OF INNOVATION TYPES ON FIRM PERFORMANCE	GUNDAY GURHAN;ULUSOY GUNDUZ;KILIC KEMAL;ALPKAN LUTFIHAK	2011	835	55.67	INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS
		Engineering				
Rank	**Paper**	**Author**	**PY**	**TC**	**C / Y**	**Journal**
1	THE SOCIAL DIMENSIONS OF ENTREPRENEURSHIP	ULHOI JP	2005	958	45.62	TECHNOVATION
2	WHY DO ACADEMICS ENGAGE WITH INDUSTRY? THE ENTREPRENEURIAL UNIVERSITY AND INDIVIDUAL MOTIVATIONS	D'ESTE PABLO;PERKMANN MARKUS	2011	625	41.67	JOURNAL OF TECHNOLOGY TRANSFER
3	ENTPREPRENERIAL UNIVERSITIES AND TECHNOLOGY TRANSFER: A CONCEPTUAL FRAMEWORK FOR UNDERSTANDING KNOWLEDGE-BASED ECONOMIC DEVELOPMENT	BERCOVITZ, JANET ; FELDMAN, MARYANN	2006	596	29.80	JOURNAL OF TECHNOLOGY TRANSFER
4	ENTREPRENEURIAL ECOSYSTEMS IN CITIES: ESTABLISHING THE FRAMEWORK CONDITIONS	AUDRETSCH DAVID B;BELITSKI MAKSIM	2017	509	56.56	JOURNAL OF TECHNOLOGY TRANSFER
5	ENTREPRENEURIAL FINANCE AND TECHNOLOGY TRANSFER	AUDRETSCH DAVID B;LEHMANN ERIK E;PALEARI STEFANO; VISMARA SILVIO	2016	509	50.90	JOURNAL OF TECHNOLOGY TRANSFER
6	BUSINESS INCUBATORS AND NEW VENTURE CREATION: AN ASSESSMENT OF INCUBATING MODELS	GRIMALDI, ROSA ; GRANDI, ALESSANDRO	2005	484	23.05	TECHNOVATION
7	FROM THE ENTREPRENEURIAL UNIVERSITY TO THE UNIVERSITY FOR THE ENTREPRENEURIAL SOCIETY	AUDRETSCH DAVID B	2014	460	38.33	JOURNAL OF TECHNOLOGY TRANSFER
8	INCUBATOR BEST PRACTICE: A FRAMEWORK	BERGEK ANNA;NORRMAN CHARLOTTE	2008	455	25.28	TECHNOVATION
9	THE DIGITAL TRANSFORMATION OF BUSINESS MODELS IN THE CREATIVE INDUSTRIES: A HOLISTIC FRAMEWORK AND EMERGING TRENDS	LI, FENG	2020	412	68.67	TECHNOVATION
10	THE DEVELOPMENT OF AN ENTREPRENEURIAL UNIVERSITY	GUERRERO MARIBEL;URBANO DAVID	2012	406	29.00	JOURNAL OF TECHNOLOGY TRANSFER
		Entrepreneurship				
Rank	**Paper**	**Author**	**PY**	**TC**	**C / Y**	**Journal**
1	SOCIAL AND COMMERCIAL ENTREPRENEURSHIP: SAME, DIFFERENT, OR BOTH?	AUSTIN J;STEVENSON H;WEI-SKILLERN J	2006	1941	97.05	ENTREPRENEURSHIP THEORY AND PRACTICE
2	DEVELOPMENT AND CROSS-CULTURAL APPLICATION OF A SPECIFIC INSTRUMENT TO MEASURE ENTREPRENEURIAL INTENTIONS	LINAN FRANCISCO;CHEN YI-WEN	2009	1861	109.47	ENTREPRENEURSHIP THEORY AND PRACTICE
3	DISCOVERY AND CREATION: ALTERNATIVE THEORIES OF ENTREPRENEURIAL ACTION	ALVAREZ SHARON A;BARNEY JAY B	2007	1280	67.37	STRATEGIC ENTREPRENEURSHIP JOURNAL
4	DIGITAL ENTREPRENEURSHIP: TOWARD A DIGITAL TECHNOLOGY PERSPECTIVE OF ENTREPRENEURSHIP	NAMBISAN SATISH	2017	1217	135.22	ENTREPRENEURSHIP THEORY AND PRACTICE
5	ENTREPRENEURIAL INTENTIONS: APPLYING THE THEORY OF PLANNED BEHAVIOUR	KRUEGER, NORRIS F. ; CARSRUD, ALAN L.	1993	1165	35.30	ENTREPRENEURSHIP AND REGIONAL DEVELOPMENT
6	DEFINING INTERNATIONAL ENTREPRENEURSHIP AND MODELING THE SPEED OF INTERNATIONALIZATION	OVIATT BM;MCDOUGALL PP	2005	1122	53.43	ENTREPRENEURSHIP THEORY AND PRACTICE
7	GENDER, ENTREPRENEURIAL SELF-EFFICACY, AND ENTREPRENEURIAL CAREER INTENTIONS: IMPLICATIONS FOR ENTREPRENEURSHIP EDUCATION	WILSON FIONA;KICKUL JILL;MARLINO DEBORAH	2007	1098	57.79	ENTREPRENEURSHIP THEORY AND PRACTICE
8	THE RELATIONAL ORGANIZATION OF ENTREPRENEURIAL ECOSYSTEMS	SPIGEL BEN	2017	1001	111.22	ENTREPRENEURSHIP THEORY AND PRACTICE
9	SIGNALING IN EQUITY CROWDFUNDING	AHLERS GERRIT K C;CUMMING DOUGLAS;GUENTHER CHRISTINA; SCHWEIZER DENIS	2015	997	90.64	ENTREPRENEURSHIP THEORY AND PRACTICE
10	ENTERPRISE EDUCATION: INFLUENCING STUDENTS' PERCEPTIONS OF ENTREPRENEURSHIP	PETERMAN NE;KENNEDY J	2003	894	38.87	ENTREPRENEURSHIP THEORY AND PRACTICE

Source: Own Elaboration

PY = Publication Year, TC = Total Citations, C / Y = Citations per Year

Environmental Sciences

Rank	Paper	Author	PY	TC	C / Y	Journal
1	SUSTAINABLE ENTREPRENEURSHIP AND SUSTAINABILITY INNOVATION: CATEGORIES AND INTERACTIONS	SCHALTEGGER STEFAN;WAGNER MARCUS	2011	1006	67.07	BUSINESS STRATEGY AND THE ENVIRONMENT
2	BUSINESS MODEL INNOVATION FOR SUSTAINABILITY: TOWARDS A UNIFIED PERSPECTIVE FOR CREATION OF SUSTAINABLE BUSINESS MODELS	EVANS, STEVE ; VLADIMIROVA, DOROTEYA ; HOLGADO, MARIA ; VAN FOSSEN, KIRSTEN ; YANG, MIYING ; SILVA, ELISABETE A. ; BARLOW, CLAIRE Y.	2017	819	91.00	BUSINESS STRATEGY AND THE ENVIRONMENT
3	BUSINESS MODELS AND SUPPLY CHAINS FOR THE CIRCULAR ECONOMY	GEISSDOERFER, MARTIN ; MORIOKA, SANDRA NAOMI ; DE CARVALHO, MARLY MONTEIRO ; EVANS, STEVE	2018	795	99.38	JOURNAL OF CLEANER PRODUCTION
4	PRODUCT-SERVICES AS A RESEARCH FIELD: PAST, PRESENT AND FUTURE. REFLECTIONS FROM A DECADE OF RESEARCH	TUKKER, ARNOLD ; TISCHNER, URSULA	2006	767	38.35	JOURNAL OF CLEANER PRODUCTION
5	THE TRIPLE LAYERED BUSINESS MODEL CANVAS: A TOOL TO DESIGN MORE SUSTAINABLE BUSINESS MODELS	JOYCE, ALEXANDRE ; PAQUIN, RAYMOND L.	2016	764	76.40	JOURNAL OF CLEANER PRODUCTION
6	DIVERSITY OF ECO-INNOVATIONS: REFLECTIONS FROM SELECTED CASE STUDIES	CARRILLO-HERMOSILLA, JAVIER ; DEL RÍO, PABLO ; KÖNNÖLÄ, TOTTI	2010	676	42.25	JOURNAL OF CLEANER PRODUCTION
7	SUSTAINABLE INNOVATION, BUSINESS MODELS AND ECONOMIC PERFORMANCE: AN OVERVIEW	BOONS FRANK;MONTALVO CARLOS;QUIST JACO;WAGNER MARCUS	2013	648	49.85	JOURNAL OF CLEANER PRODUCTION
8	SUSTAINABLE VALLEY ENTREPRENEURIAL ECOSYSTEMS	COHEN, BOYD	2006	528	26.40	BUSINESS STRATEGY AND THE ENVIRONMENT
9	CIRCULAR BUSINESS MODEL INNOVATION: INHERENT UNCERTAINTIES	LINDER MARCUS;WILLIANDER MATS	2017	524	58.22	BUSINESS STRATEGY AND THE ENVIRONMENT
10	THE DETERMINANTS OF REGIONAL VARIATION IN NEW FIRM FORMATION	ARMINGTON C;ACS ZJ	2002	519	21.63	REGIONAL STUDIES

Finance

Rank	Paper	Author	PY	TC	C / Y	Journal
1	MANAGEMENT OWNERSHIP AND MARKET VALUATION. AN EMPIRICAL ANALYSIS	MORCK, RANDALL ; SHLEIFER, ANDREI ; VISHNY, ROBERT W.	1988	4043	106.39	JOURNAL OF FINANCIAL ECONOMICS
2	HOW DO FAMILY OWNERSHIP, CONTROL AND MANAGEMENT AFFECT FIRM VALUE?	VILLALONGA, BELEN ; AMIT, RAPHAEL	2006	2441	122.05	JOURNAL OF FINANCIAL ECONOMICS
3	THE STRUCTURE AND GOVERNANCE OF VENTURE-CAPITAL ORGANIZATIONS	SAHLMAN, WILLIAM A.	1990	1458	40.50	JOURNAL OF FINANCIAL ECONOMICS
4	FINANCIAL DEVELOPMENT AND INNOVATION: CROSS-COUNTRY EVIDENCE	HSU PO-HSUAN;TIAN XUAN;XU YAN	2014	943	78.58	JOURNAL OF FINANCIAL ECONOMICS
5	ARE FAMILY FIRMS REALLY SUPERIOR PERFORMERS?	MILLER, DANNY ; LE BRETON-MILLER, ISABELLE ; LESTER, RICHARD H. ; CANNELLA JR., ALBERT A.	2007	883	46.47	JOURNAL OF CORPORATE FINANCE
6	ENTRY REGULATION AS A BARRIER TO ENTREPRENEURSHIP	KLAPPER LEORA;LAEVEN LUC;RAJAN RAGHURAM	2006	775	38.75	JOURNAL OF FINANCIAL ECONOMICS
7	ARE RED OR BLUE COMPANIES MORE LIKELY TO GO GREEN? POLITICS AND CORPORATE SOCIAL RESPONSIBILITY	DI GIULI, ALBERTA ; KOSTOVETSKY, LEONARD	2014	774	64.50	JOURNAL OF FINANCIAL ECONOMICS
8	VENTURE CAPITAL AND THE STRUCTURE OF CAPITAL MARKETS: BANKS VERSUS STOCK MARKETS	BLACK BS;GILSON RJ	1998	658	23.50	JOURNAL OF FINANCIAL ECONOMICS
9	THE INTERACTION BETWEEN PRODUCT MARKET AND FINANCING STRATEGY: THE ROLE OF VENTURE CAPITAL	HELLMANN, THOMAS ; PURI, MANJU	2000	656	25.23	REVIEW OF FINANCIAL STUDIES
10	THE DETERMINANTS OF VENTURE CAPITAL FUNDING: EVIDENCE ACROSS COUNTRIES	JENG, LESLIE A. ; WELLS, PHILIPPE C.	2000	591	22.73	JOURNAL OF CORPORATE FINANCE

Marketing

Rank	Paper	Author	PY	TC	C / Y	Journal
1	INNOVATIVENESS: ITS ANTECEDENTS AND IMPACT ON BUSINESS PERFORMANCE	HULT GTM;HURLEY RF;KNIGHT GA	2004	1244	56.55	INDUSTRIAL MARKETING MANAGEMENT
2	THE NEW PUBLIC SERVICE: SERVING RATHER THAN STEERING	DENHARDT RB;DENHARDT JV	2000	753	28.96	PUBLIC ADMINISTRATION REVIEW
3	THE MARKETIZATION OF THE NONPROFIT SECTOR: CIVIL SOCIETY AT RISK?	EIKENBERRY AM;KLUVER JD	2004	750	34.09	PUBLIC ADMINISTRATION REVIEW
4	GROWING THE ENTREPRENEURIAL FIRM: NETWORKING FOR INTERNATIONAL MARKET DEVELOPMENT	COVIELLO, NICOLE E. ; MUNRO, HUGH J.	1995	688	22.19	EUROPEAN JOURNAL OF MARKETING
5	DECONSTRUCTING THE RELATIONSHIP BETWEEN ENTREPRENEURIAL ORIENTATION AND BUSINESS PERFORMANCE AT THE EMBRYONIC STAGE OF FIRM GROWTH	HUGHES MATHEW;MORGAN ROBERT E	2007	556	29.26	INDUSTRIAL MARKETING MANAGEMENT
6	COLLABORATIVE INNOVATION: A VIABLE ALTERNATIVE TO MARKET COMPETITION AND ORGANIZATIONAL ENTREPRENEURSHIP	HARTLEY JEAN;SORENSEN EVA;TORFING JACOB	2013	371	28.54	PUBLIC ADMINISTRATION REVIEW
7	RISE OF STRATEGIC NETS - NEW MODES OF VALUE CREATION	MÖLLER, KRISTIAN ; RAJALA, ARTO	2007	369	19.42	INDUSTRIAL MARKETING MANAGEMENT
8	INTERNET OF THINGS TECHNOLOGIES, DIGITAL SERVITIZATION AND BUSINESS MODEL INNOVATION IN BTOB MANUFACTURING FIRMS	PAIOLA, MARCO ; GEBAUER, HEIKO	2020	334	55.67	INDUSTRIAL MARKETING MANAGEMENT
9	NETWORKING CAPABILITY AND INTERNATIONAL ENTREPRENEURSHIP - HOW NETWORKS FUNCTION IN AUSTRALIAN BORN GLOBAL FIRMS	MORT GILLIAN SULLIVAN;WEERAWARDENA JAY	2006	321	16.05	INTERNATIONAL MARKETING REVIEW
10	DEMAND CHAIN MANAGEMENT-INTEGRATING MARKETING AND SUPPLY CHAIN MANAGEMENT	JÜTTNER, UTA ; CHRISTOPHER, MARTIN ; BAKER, SUSAN	2007	318	16.74	INDUSTRIAL MARKETING MANAGEMENT

Social Sciences

Rank	Paper	Author	PY	TC	C / Y	Journal
1	SOCIAL STRUCTURE AND COMPETITION IN INTERFIRM NETWORKS: THE PARADOX OF EMBEDDEDNESS	UZZI B	1997	5512	190.07	ADMINISTRATIVE SCIENCE QUARTERLY
2	CREATING SOMETHING FROM NOTHING: RESOURCE CONSTRUCTION THROUGH ENTREPRENEURIAL BRICOLAGE	BAKER T;NELSON RE	2005	2185	104.05	ADMINISTRATIVE SCIENCE QUARTERLY
3	INTERORGANIZATIONAL ENDORSEMENTS AND THE PERFORMANCE OF ENTREPRENEURIAL VENTURES	STUART TE;HOANG H;HYBELS RC	1999	1618	59.93	ADMINISTRATIVE SCIENCE QUARTERLY
4	NETWORK DYADS IN ENTREPRENEURIAL SETTINGS - A STUDY OF THE GOVERNANCE OF EXCHANGE RELATIONSHIPS	LARSON A	1992	1419	41.74	ADMINISTRATIVE SCIENCE QUARTERLY
5	SURVIVAL OF THE FITTEST? ENTREPRENEURIAL HUMAN CAPITAL AND THE PERSISTENCE OF UNDERPERFORMING FIRMS	GIMENO J;FOLTA TB;COOPER AC;WOO CY	1997	1288	44.41	ADMINISTRATIVE SCIENCE QUARTERLY
6	ENTREPRENEURIAL ECOSYSTEMS AND REGIONAL POLICY: A SYMPATHETIC CRITIQUE	STAM ERIK	2015	941	85.55	EUROPEAN PLANNING STUDIES
7	WHEN INNOVATIONS MEET INSTITUTIONS: EDISON AND THE DESIGN OF THE ELECTRIC LIGHT	HARGADON AB;DOUGLAS Y	2001	791	31.64	ADMINISTRATIVE SCIENCE QUARTERLY
8	ORGANIZATIONAL DYNAMICS OF MARKET TRANSITION - HYBRID FORMS, PROPERTY-RIGHTS, AND MIXED ECONOMY IN CHINA	NEE V	1992	735	21.62	ADMINISTRATIVE SCIENCE QUARTERLY
9	INSTITUTIONAL WORK IN THE TRANSFORMATION OF AN ORGANIZATIONAL FIELD: THE INTERPLAY OF BOUNDARY WORK AND PRACTICE WORK	ZIETSMA CHARLENE;LAWRENCE THOMAS B	2010	660	41.25	ADMINISTRATIVE SCIENCE QUARTERLY
10	HOW ENTREPRENEURS USE SYMBOLIC MANAGEMENT TO ACQUIRE RESOURCES	ZOTT CHRISTOPH;HUY QUY NGUYEN	2007	647	34.05	ADMINISTRATIVE SCIENCE QUARTERLY

Source: Own Elaboration

PY = Publication Year, TC = Total Citations, C / Y = Citations per Year

A-5.2.2b Top 10 Most Cited Authors

Business/Management		Economics		Engineering		Entrepreneurship		Environmental Sciences		Finance		Marketing		Social Sciences	
SHANE SCOTT	20287	ACS ZOLTAN J	6629	AUDRETSCH DAVID I	2817	WRIGHT MIKE	4842	BOCKEN NANCY M.P	3069	SHLEIFER ANDREI	4496	KNIGHT GARY	1337	UZZI BRIAN	5512
ZAHRA SHAKER A	17852	AUDRETSCH DAVID I	6351	WRIGHT MIKE	1680	LINAN FRANCISCO	4149	EVANS STEVE	1915	MORCK RANDALL	4189	HULT G	1329	BAKER T	2185
SHEPHERD DEAN A	13524	THURIK ROY	4559	LEHMANN ERIK E	1285	WELTER FRIEDERIKE	3265	WAGNER MARCUS	1758	VISHNY ROBERT W.	4043	HURLEY R	1244	NELSON R	2185
WRIGHT MIKE	13251	CARLSSON BO	3187	CARAYANNIS ELIAS	1221	ANDERSON ALISTAIF	3263	GEISSDOERFER MAR	1376	VILLALONGA BELEN	2517	WEERAWARDENA JA	1191	STUART TE	1866
COVIN JEFFREY	9787	VAN STEL ANDRE	3035	GUERRERO MARIBEL	1125	LUMPKIN G T	3015	ACS ZJ	1344	VILLALONGA B	2517	DENHARDT RB	910	HOANG H	1618
VENKATARAMAN S	8343	LA PORTA RAFAEL	2572	RASMUSSEN EINAR	1046	COVIN JEFFREY G	2983	FRITSCH MICHAEL	1306	TIAN XUAN	2035	DENHARDT JV	753	HYBELS R	1618
BARON ROBERT A	7815	LOPEZ-DE-SILANES F	2572	URBANO DAVID	1038	SHEPHERD DEAN	2821	WU FULONG	1123	SAHLMAN WILLIAM	1458	EIKENBERRY AM	750	LARSON A	1419
WIKLUND JOHAN	7592	SHLEIFER ANDREI	2572	VISMARA SILVIO	1026	DANA LEO PAUL	2661	YANG MENGYUAN	1122	CUMMING DOUGLAS	1444	KLUVER JD	750	KLOOSTERMAN ROB	1313
AMIT RAPHAEL	7346	REYNOLDS PAUL DA	2564	ULHOI JP	958	NAMBISAN SATISH	2574	VLADIMIROVA DOR(	1120	LERNER JOSH	1031	MORGAN ROBERT E	748	COOPER A	1288
MCDOUGALL PATRIC	7036	BOSMA NIELS	2370	CUNNINGHAM JAME	789	MARLOW SUSAN	2426	SCHALTEGGER STEF/	1118	HELLMANN THOMAS	1018	COVIELLO NICOLE E.	738	FOLTA T	1288

Source: Own Elaboration

A-5.2.2c Top 10 Journals, Total Citations

Business/Management		Economics		Engineering		Entrepreneurship		Environmental Sciences		Finance		Marketing		Social Sciences	
JOURNAL OF BUSINESS VENTURING	180241	SMALL BUSINESS ECONOMICS	88113	TECHNOVATION	26551	ENTREPRENEURSHIP THEORY AND PRACTICE	77081	JOURNAL OF CLEANER PRODUCTION	31167	JOURNAL OF FINANCIAL ECONOMICS	21128	INDUSTRIAL MARKETING MANAGEMENT	16353	ADMINISTRATIVE SCIENCE QUARTERLY	23105
STRATEGIC MANAGEMENT JOURNAL	61203	AMERICAN ECONOMIC REVIEW	9772	JOURNAL OF TECHNOLOGY TRANSFER	20563	ENTREPRENEURSHIP AND REGIONAL DEVELOPMENT	40571	SUSTAINABILITY	11072	JOURNAL OF FINANCE	11072	JOURNAL OF MARKETING	6120	EDUCATION AND TRAINING	18118
RESEARCH POLICY	59045	QUARTERLY JOURNAL OF ECONOMICS	9358	IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT	5347	INTERNATIONAL ENTREPRENEURSHIP AND MANAGEMENT JOURNAL	26014	REGIONAL STUDIES	12246	VENTURE CAPITAL	8984	INTERNATIONAL MARKETING REVIEW	5181	WORLD DEVELOPMENT	8770
JOURNAL OF BUSINESS RESEARCH	52291	JOURNAL OF EVOLUTIONARY ECONOMICS	6465	JOURNAL OF OPEN INNOVATION: TECHNOLOGY, MARKET, AND COMPLEXITY	4733	STRATEGIC ENTREPRENEURSHIP JOURNAL	24057	BUSINESS STRATEGY AND THE ENVIRONMENT	11434	JOURNAL OF CORPORATE FINANCE	6609	JOURNAL OF INTERNATIONAL MARKETING	3998	TOURISM MANAGEMENT	8016
ACADEMY OF MANAGEMENT JOURNAL	44066	JOURNAL OF DEVELOPMENT ECONOMICS	5962	TECHNOLOGY IN SOCIETY	3360	INTERNATIONAL SMALL BUSINESS JOURNAL-RESEARCHING ENTREPRENEURSHIP	22745	URBAN STUDIES	8208	REVIEW OF FINANCIAL STUDIES	6129	EUROPEAN JOURNAL OF MARKETING	3912	JOURNAL OF RURAL STUDIES	7379
ACADEMY OF MANAGEMENT REVIEW	39452	JOURNAL OF ECONOMIC BEHAVIOR AND ORGANIZATION	5775	INTERNATIONAL JOURNAL OF TECHNOLOGY MANAGEMENT	2884	INTERNATIONAL JOURNAL OF ENTREPRENEURIAL BEHAVIOUR AND RESEARCH	16021	ENVIRONMENT AND PLANNING A: ECONOMY AND SPACE	3356	JOURNAL OF BANKING AND FINANCE	3285	JOURNAL OF RESEARCH IN MARKETING AND ENTREPRENEURSHIP	2949	EUROPEAN PLANNING STUDIES	6276
JOURNAL OF SMALL BUSINESS MANAGEMENT	37504	INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS	5502	JOURNAL OF HIGH TECHNOLOGY MANAGEMENT RESEARCH	2372	INTERNATIONAL JOURNAL OF ENTREPRENEURIAL BEHAVIOR AND RESEARCH	14403	ORGANIZATION AND ENVIRONMENT	2329	JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS	1121	JOURNAL OF BUSINESS AND INDUSTRIAL MARKETING	2868	INTERNATIONAL JOURNAL OF URBAN AND REGIONAL RESEARCH	5239
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	33438	JOURNAL OF ECONOMIC GEOGRAPHY	3889	JOURNAL OF ENGINEERING AND TECHNOLOGY MANAGEMENT	1933	INTERNATIONAL JOURNAL OF ENTREPRENEURSHIP AND SMALL BUSINESS	11347	ENVIRONMENT AND PLANNING – GOVERNMENT AND POLICY	2557	FINANCE RESEARCH LETTERS	944	JOURNAL OF STRATEGIC MARKETING	2162	JOURNAL OF OPEN INNOVATION: TECHNOLOGY, MARKET, AND COMPLEXITY	4733
ORGANIZATION SCIENCE	32629	EUROPEAN ECONOMIC REVIEW	3847	RESEARCH TECHNOLOGY MANAGEMENT	1831	JOURNAL OF INTERNATIONAL ENTREPRENEURSHIP	9234	CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	2072	REVIEW OF FINANCE	859	JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	1735	HUMAN RELATIONS	4553
MANAGEMENT SCIENCE	25958	JOURNAL OF INNOVATION AND KNOWLEDGE	3359	JOURNAL OF MANUFACTURING TECHNOLOGY MANAGEMENT	1676	JOURNAL OF SMALL BUSINESS AND ENTREPRENEURSHIP	7764	JOURNAL OF ENVIRONMENTAL MANAGEMENT	1431	INTERNATIONAL REVIEW OF ECONOMICS AND FINANCE	726	INTERNATIONAL JOURNAL OF RESEARCH IN MARKETING	1044	JOURNAL OF ETHNIC AND MIGRATION STUDIES	3693

Source: Own Elaboration

A-5.2.2d Top 10 Research Institutions, Number of Publications (NP)

Business/Management		Economics		Engineering		Entrepreneurship		Environmental Sciences		Finance		Marketing		Social Sciences	
INDIANA UNIV	342	ERASMUS UNIV	128	INDIANA UNIV	57	INDIANA UNIV	144	BUCHAREST UNIV ECON STUDIES	81	HARVARD UNIV	20	UPPSALA UNIV	18	LUND UNIV	44
COPENHAGEN BUSINESS SCH	191	INDIANA UNIV	109	GEORGE WASHINGTON UNIV	49	UNIV LANCASTER	125	KING FAISAL UNIV	57	BOSTON COLL	15	UNIV LANCASTER	15	UNIV SURREY	29
ERASMUS UNIV	184	UNIV N CAROLINA	68	UNIV BERGAMO	46	UNIV SHEFFIELD	115	UNIV UTRECHT	54	FLORIDA ATLANTIC UNIV	13	UNIV QUEENSLAND	15	UNIV AMSTERDAM	27
UNIV N CAROLINA	167	GEORGE MASON UNIV	61	UNIV AUGSBURG	39	UNIV VALENCIA	107	ALEXANDRU IOAN CUZA UNIV	47	STERN SCH BUSINESS	13	LUT UNIV	14	NEWCASTLE UNIV	24
HARVARD UNIV	159	UNIV GRONINGEN	57	LUND UNIV	30	UNIV NOTTINGHAM	81	TRANSILVANIA UNIV BRASOV	46	HARVARD SCH BUSINESS	12	UNIV VAASA	14	UMEA UNIV	21
UNIV PENN	155	UNIV BERGAMO	53	ARIZONA STATE UNIV	28	UNIV STRATHCLYDE	79	LUND UNIV	40	STANFORD UNIV	12	UNIV BIRMINGHAM	13	UNIV LEEDS	21
UNIV ST GALLEN	154	UNIV UTRECHT	51	LINKOPING UNIV	27	LUND UNIV	76	UNIV BEIRA INTERIOR	37	UNIV PENN	12	UNIV DURHAM	13	BEN GURION UNIV NEGEV	20
BABSON COLL	153	LUND UNIV	45	UNIV BOLOGNA	27	UNIV N CAROLINA	75	UNIV VALENCIA	37	BABSON COLLEGE	11	UNIV EASTERN FINLAND	13	HONG KONG POLYTECH UNIV	19
UNIV MINNESOTA	152	MAX PLANCK INST ECON	42	UNIV READING	27	UNIV SEVILLE	74	JIANGSU UNIV	36	UNIV BRITISH COLUMBIA	11	UNIV LEEDS	13	UNIV CALIF LOS ANGELES	18
UNIV NOTTINGHAM	141	RES INST IND ECON IFN	41	UNIV DESARROLLO	26	JONKOPING UNIV	72	ZHEJIANG UNIV	34	DUKE UNIV	10	UNIV HAIFA	12	WORLD BANK	18

Source: Own Elaboration

A-5.2.2e Top 10 Countries, Total Citations (TC)

Business/Management		Economics		Engineering		Entrepreneurship		Environmental Sciences		Finance		Marketing		Social Sciences	
USA	350837	USA	42690	USA	7293	USA	77559	UNITED KINGDOM	12312	USA	21132	USA	7505	USA	28633
UNITED KINGDOM	95151	GERMANY	15447	UNITED KINGDOM	6558	UNITED KINGDOM	42351	CHINA	9316	CANADA	2714	UNITED KINGDOM	4313	UNITED KINGDOM	12204
CANADA	53558	UNITED KINGDOM	13460	ITALY	4702	SPAIN	15691	NETHERLANDS	8272	UNITED KINGDOM	2434	FINLAND	2690	NETHERLANDS	4659
GERMANY	31536	NETHERLANDS	12411	GERMANY	3102	CANADA	11809	GERMANY	6696	ITALY	1611	AUSTRALIA	2262	CANADA	3330
ITALY	31021	ITALY	6896	SWEDEN	2498	GERMANY	9575	USA	5590	CHINA	1445	CHINA	1579	AUSTRALIA	3043
CHINA	30696	SWEDEN	5528	SPAIN	2497	SWEDEN	8895	SWEDEN	4892	GERMANY	925	SWEDEN	1198	GERMANY	2786
SPAIN	30138	CHINA	5059	NETHERLANDS	2159	AUSTRALIA	7090	SPAIN	4505	BELGIUM	663	ITALY	872	FINLAND	2495
SWEDEN	24141	SPAIN	4111	DENMARK	1723	ITALY	6974	ITALY	3981	FRANCE	636	CANADA	863	FRANCE	2114
FRANCE	23038	FRANCE	3580	CHINA	1634	NETHERLANDS	6737	CANADA	3304	AUSTRALIA	625	IRELAND	695	CHINA	1928
NETHERLANDS	20744	BELGIUM	2687	NORWAY	1317	CHINA	5553	FINLAND	2431	SWITZERLAND	457	NEW ZEALAND	617	SWEDEN	1924

Source: Own Elaboration

A-5.3.1 Keyword Analysis Per Document Type

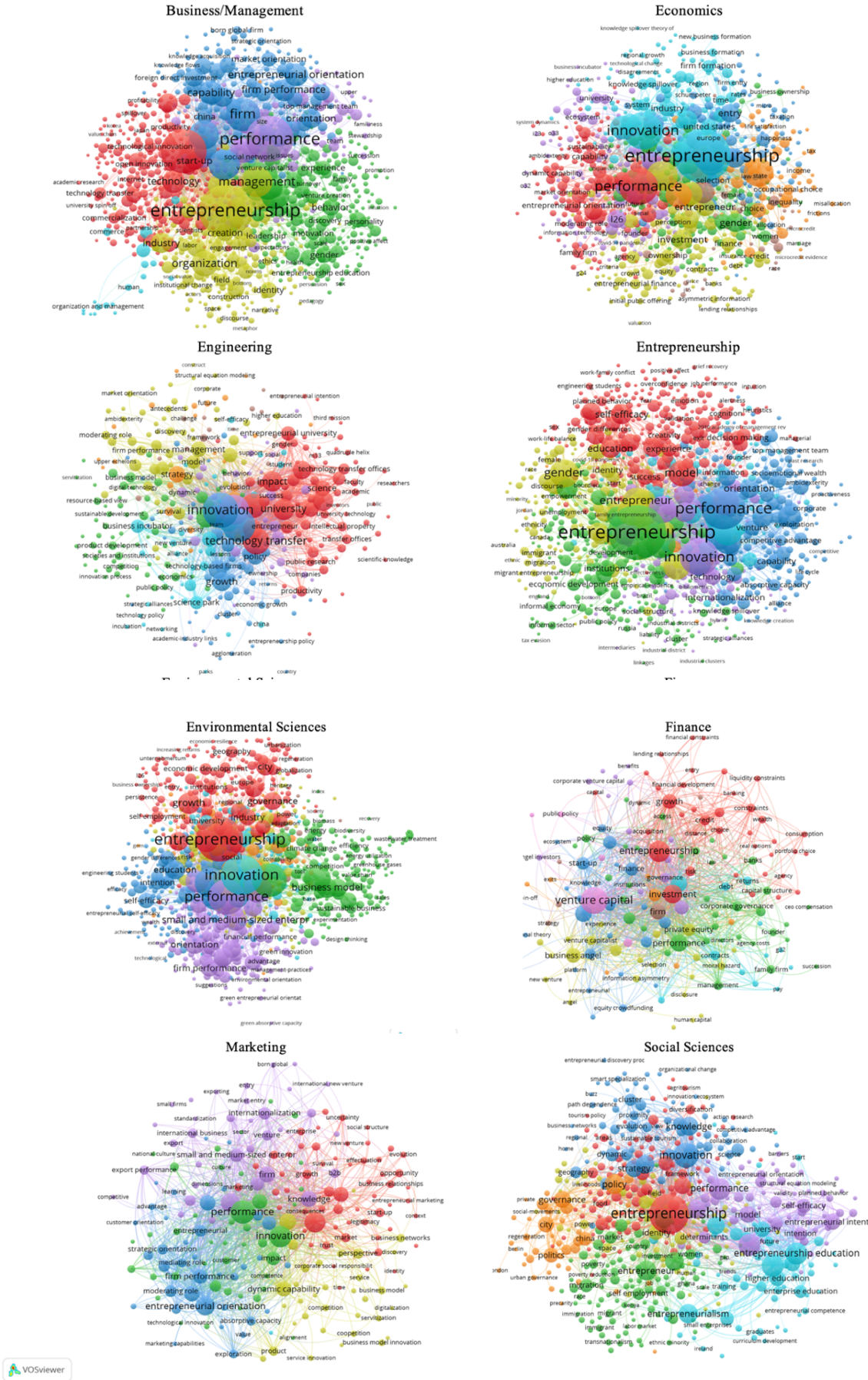
Articles				Conferences & Proceedings				Editorials			
Author Keywords (DE)	N	Index Keyword (ID)	N	Author Keywords (DE)	N	Index Keyword (ID)	N	Author Keywords (DE)	N	Index Keyword (ID)	N
Entrepreneurship	16224	Entrepreneurship	11383	Entrepreneurship	3860	Students	1809	Entrepreneurship	2734	Performance	659
Innovation	5748	Performance	10401	Innovation	1727	Entrepreneurship	1408	Innovation	1179	Entrepreneurship	581
Sustainability	1924	Innovation	8656	Entrepreneurship Education	736	Engineering Education	1168	Entrepreneurship Education	559	Innovation	501
Entrepreneurs	1919	Impact	6369	Education	540	Innovation	1106	Education	427	Management	308
Social Entrepreneurship	1914	Management	5367	Entrepreneur	453	Performance	833	Entrepreneur	339	Model	291
Entrepreneurial Orientation	1906	Growth	4206	Social Entrepreneurship	412	Commerce	767	Smes	294	Firms	288
Smes	1848	Knowledge	4202	Smes	405	Curricula	745	Development	289	Education	274
Entrepreneurship Educatior	1789	Business	4074	Sustainability	343	Sustainable Development	660	Social Entrepreneurship	281	Knowledge	265
Gender	1773	Model	3816	Development	339	Competition	641	Entrepreneurial	245	Growth	249
Performance	1719	Firms	3155	Higher Education	321	Education	640	Higher Education	242	Impact	240
China	1638	Determinants	2595	Innovation And Entrepreneurshi	304	Economics	606	Business	233	Firm	157
Entrepreneurial Intention	1440	Education	2576	Entrepreneurs	294	Investments	559	Management	225	Business	153
Entrepreneurial	1357	Technology	2272	Business	284	Entrepreneurship Educatior	535	Entrepreneurs	215	Strategy	150
Education	1328	Strategy	2226	Management	284	Teaching	503	Sustainability	187	Technology	142
Entrepreneur	1319	Orientation	2209	Entrepreneurial	270	Industry	460	Innovation And Entrepreneurshi	183	Networks	141
Development	1207	Networks	2201	Business Model	262	Economic And Social Effec	454	Performance	172	Orientation	139
Social Capital	1188	Industry	2136	Sustainable Development	243	Decision Making	427	Competitiveness	157	Capabilities	116
Venture Capital	1127	Article	2129	Entrepreneurial Orientation	233	Information Systems	426	Creativity	154	Students	107
Covid-19	1088	Firm Performance	2102	Performance	230	Management	386	Entrepreneurial Orientation	154	Behavior	103
Entrepreneurialism	1030	Policy	2048	Creativity	221	Industrial Management	374	University	148	Industry	102
Self-Employment	974	Gender	2047	Entrepreneurial Intention	215	Surveys	372	SME	144	Smes	100
Business	960	Behavior	2028	Technology	215	Technology	335	Technology	144	Systems	95
Sustainable Development	944	Firm	2009	SME	189	Engineering Research	331	Knowledge	141	Determinants	94
Strategy	923	Perspective	1957	Competitiveness	188	Business Models	330	Social	133	Entrepreneurial Orientatior	94
Social	922	Entrepreneurial Orientatior	1954	University	177	Education Computing	327	Sustainable Development	133	Success	90
Management	913	United States	1949	Venture Capital	174	Information Management	302	College Students	128	Gender	88
Human Capital	876	Governance	1929	Startups	171	Electronic Commerce	298	Entrepreneurial Intention	125	Framework	87
Higher Education	865	Capabilities	1817	Crowdfunding	170	Knowledge Management	298	Strategy	125	Firm Performance	84
Business Model Innovatior	862	Organizations	1767	Strategy	164	Model	293	Students	123	Self-Efficacy	82
India	860	Market	1723	College Students	162	Firms	288	Learning	121	Perspective	78

Source: Own Elaboration

N = Number of Keyword Occurrences

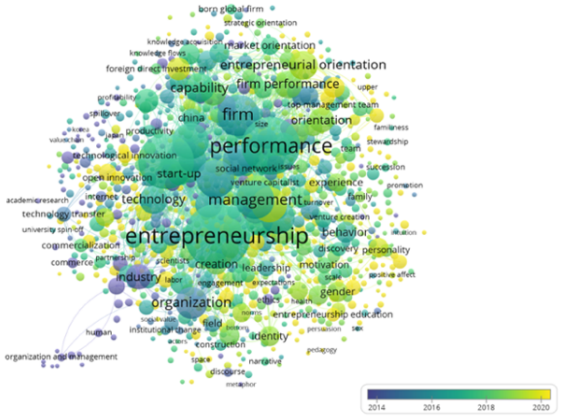
The table presents the most relevant author and index keywords across articles, conference proceedings, and editorials, ranked by frequency. As expected, author keywords appear more frequently than index keywords across all document types. The most common terms are highlighted in green, while less frequent ones are marked in red.

A-5.4.2a Network Visualization Journal Categories

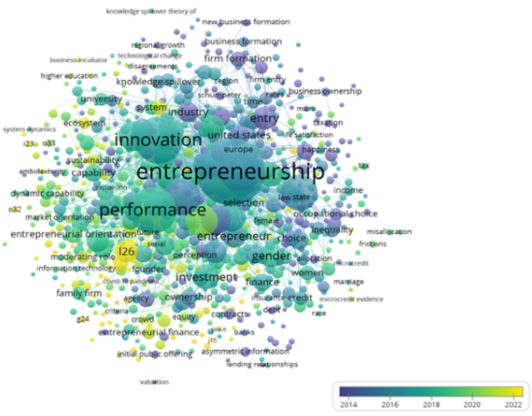


A-5.4.2b Overlay Visualization Journal Categories

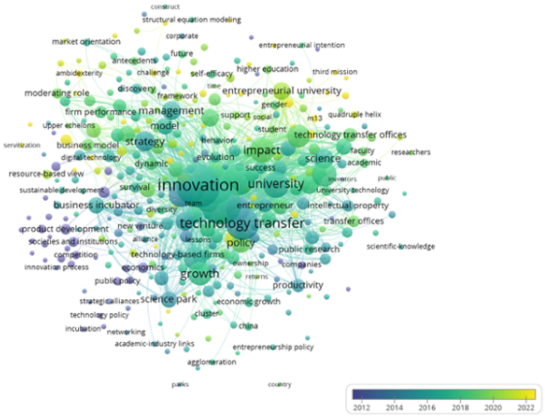
Business/Management



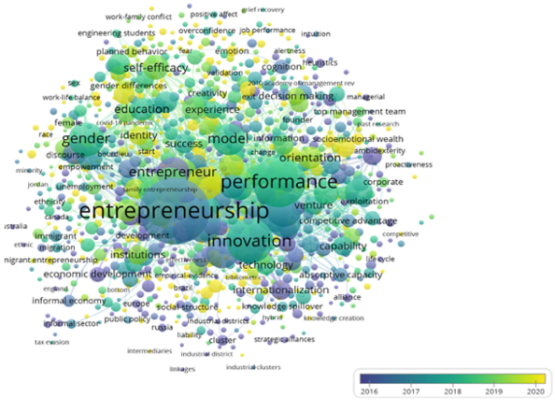
Economics



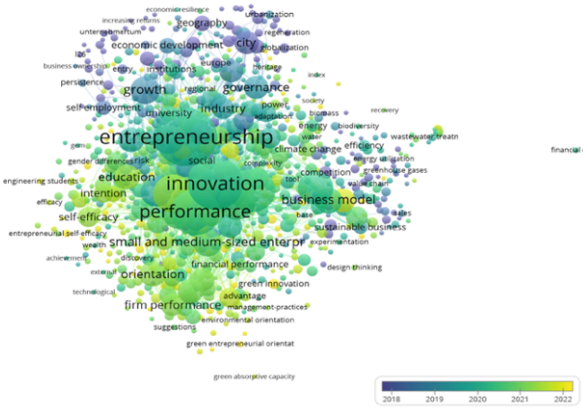
Engineering



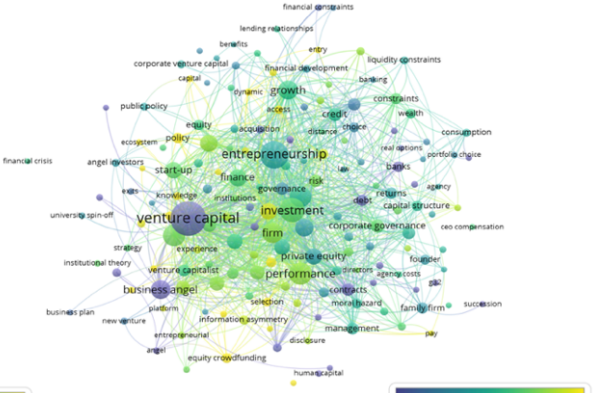
Entrepreneurship



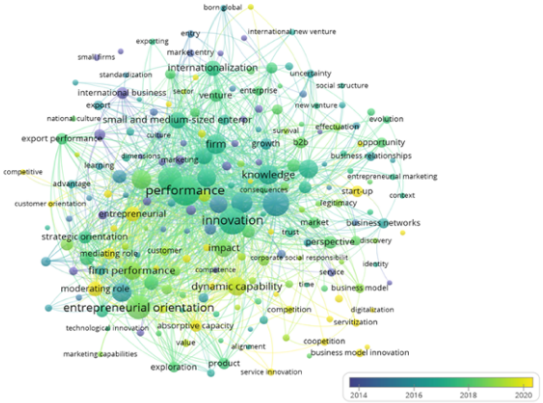
Environmental Sciences



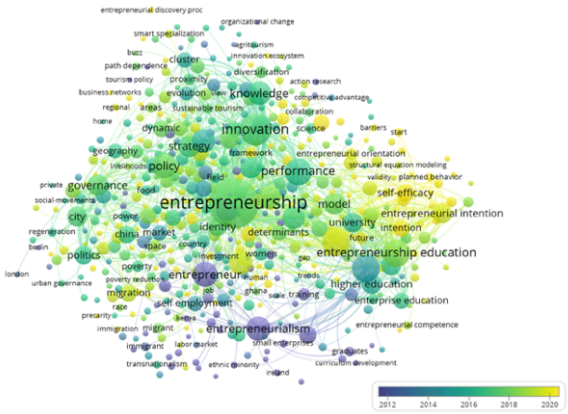
Finance



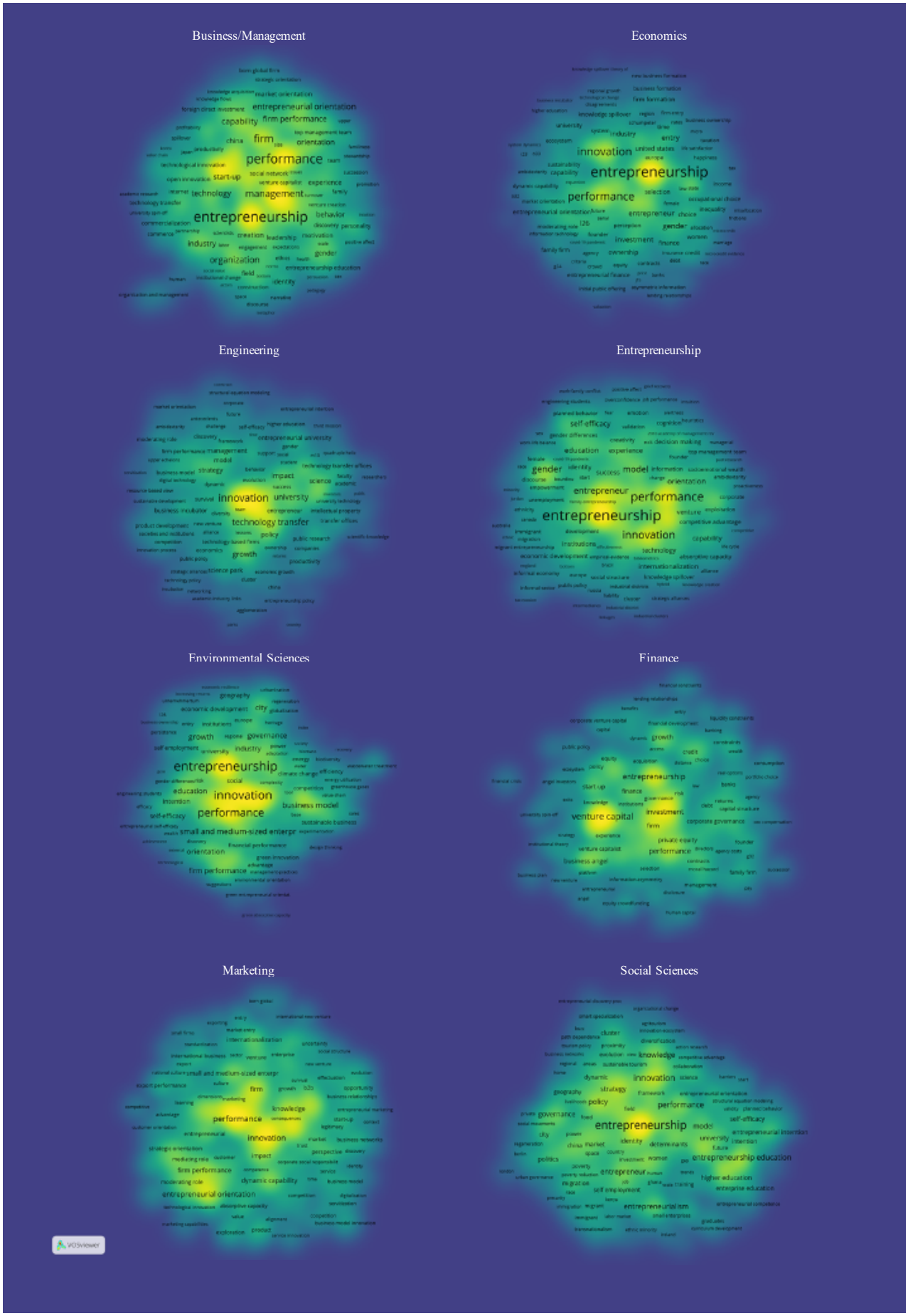
Marketing



Social Sciences



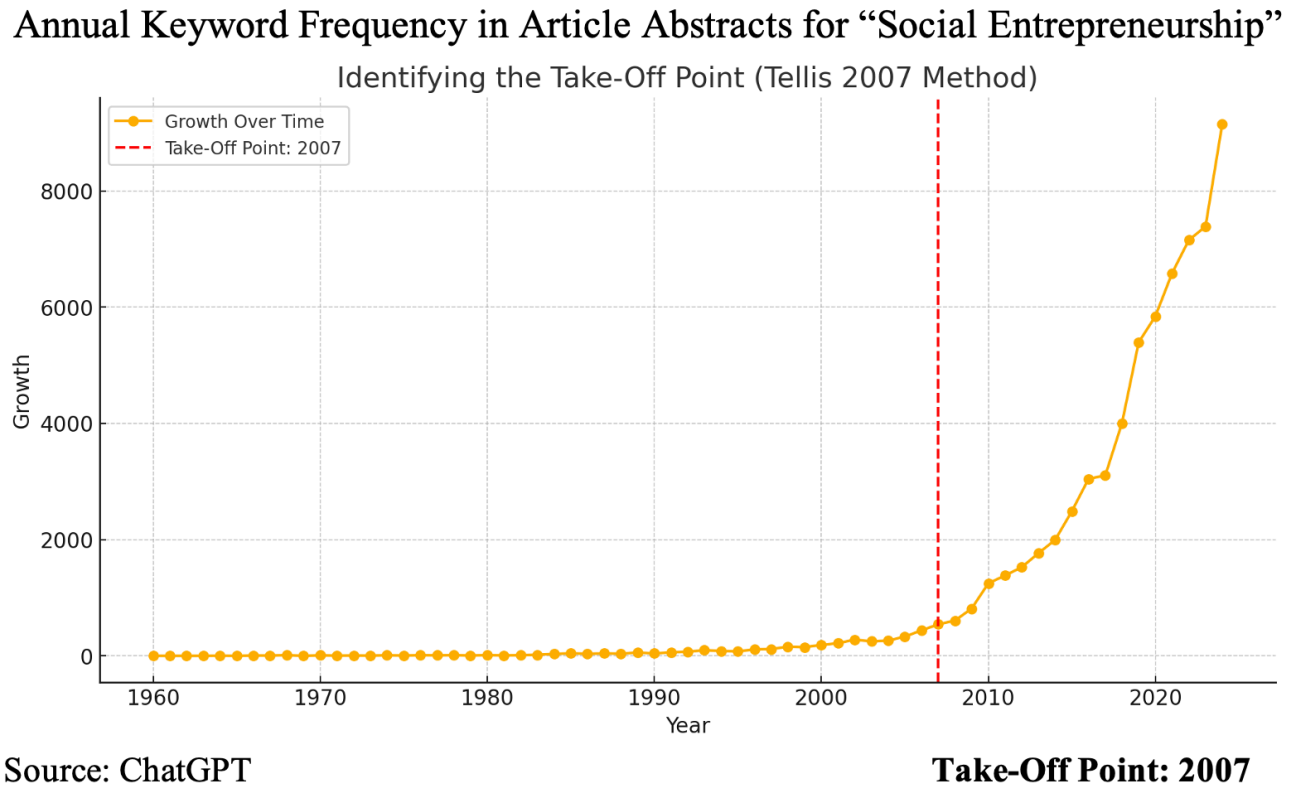
A-5.4.2c Density Visualization Journal Categories



Social Entrepreneurship

First Publications on Social Entrepreneurship (Origin)					
	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Keeble, D., & Lawson, C. (1989). Regional dynamics of innovation: A look at the Rhône-Alpes Region. Entrepreneurship & Regional Development, 1(2), 99-116.	3.3	7	Groupe Lyonnais De Sociologie Industrielle	France
Title	Theobald, R. (1987). The Rapids of Change: Social Entrepreneurship in Turbulent Times. Indianapolis, IN: Knowledge Systems, Inc. ISBN 978-0941705004.	0.4	0	University of Delaware	USA
Author Keywords	Prochaska, J. M. (1994). Social entrepreneurship: A challenge for mental health managers. Administration and Policy in Mental Health, 21(6), 531–535.	2	2	NA	USA
Index Keywords	Smith, A. (2003). The MIT IDEAS competition: Promoting innovation for public service. Proceedings of the 33rd Annual Frontiers in Education Conference, 3, S1C-1.	0.3	3	MIT	USA

Source: Own Elaboration



Publications using the trend keywords in either abstract, title, author keywords, or indexed keywords in the two years before the take-off point (2005, 2006) with highest number of citations (Dissemination)

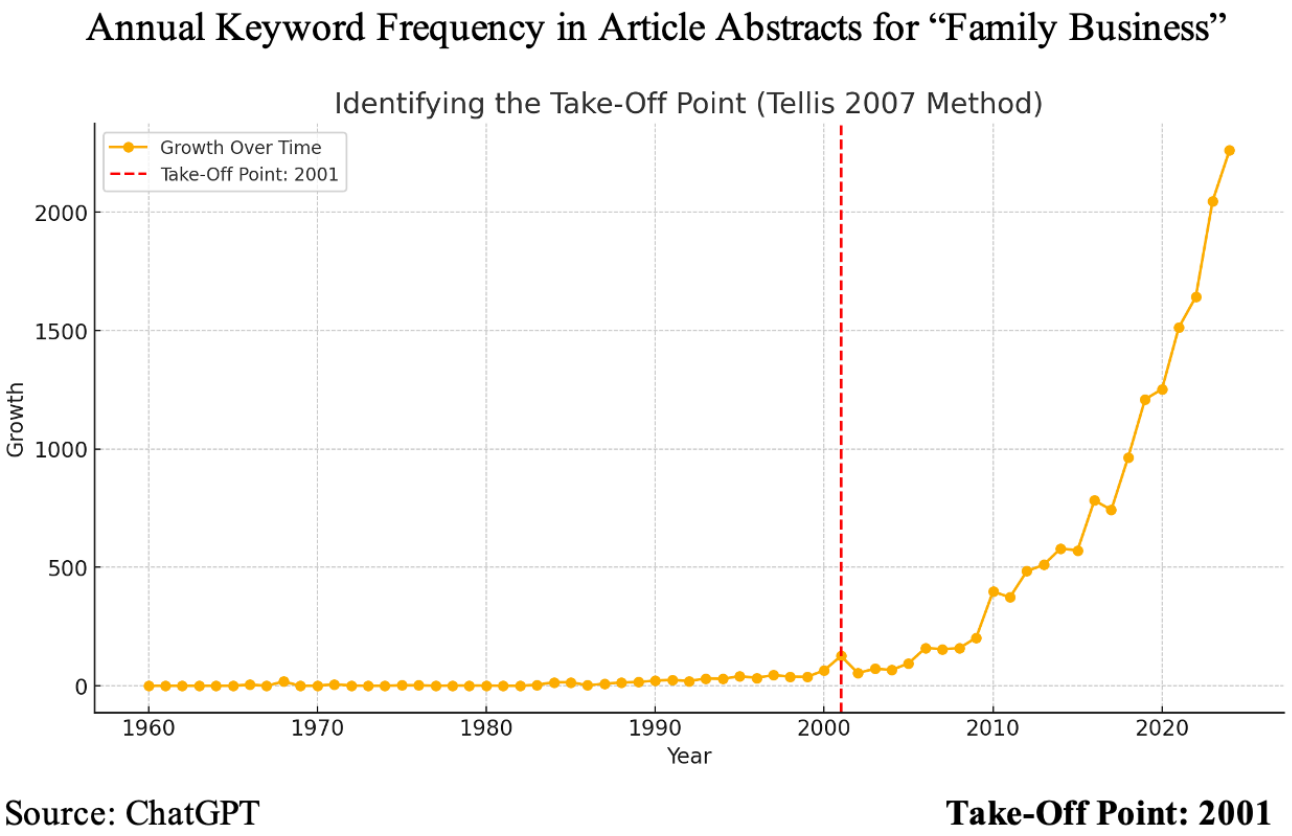
	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Seelos, C., & Mair, J. (2005). Social entrepreneurship: Creating new business models to serve the poor. Business Horizons, 48(3), 241–246.	5.8	750	IESE, Barcelona	Spain
Title	Seelos, C., & Mair, J. (2005). Social entrepreneurship: Creating new business models to serve the poor. Business Horizons, 48(3), 241–246.	5.8	750	IESE, Barcelona	Spain
Author Keywords	Seelos, C., & Mair, J. (2005). Social entrepreneurship: Creating new business models to serve the poor. Business Horizons, 48(3), 241–246.	5.8	750	IESE, Barcelona	Spain
Index Keywords	NA (no highly cited article in 2005 or 2006)				

Source: Own Elaboration

Family Business

First Publications on Family Business (Origin)					
	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Kasdan, L. (1965). Family Structure, Migration and the Entrepreneur. Comparative Studies in Society and History, 7(3), 345–357.	1.1	24	University of Wisconsin	USA
Title	Thiesenhusen, W. C. (1966). A Cooperative Farming Project in Chile: A Case Study. Land Economics, 42(2), 187–195.	4.2	0	University of Wisconsin	USA
Author Keywords	Crowne, D. P. (1966). Family orientation, level of aspiration, and interpersonal bargaining. Journal of Personality and Social Psychology, 3(6), 641–645	6.4	14	University of Connecticut	USA
Index Keywords	Crowne, D. P. (1966). Family orientation, level of aspiration, and interpersonal bargaining. Journal of Personality and Social Psychology, 3(6), 641–645	6.4	14	University of Connecticut	USA

Source: Own Elaboration



Publications using the trend keywords in either abstract, title, author keywords, or indexed keywords in the two years before the take-off point (1999, 2000) with highest number of citations (Dissemination)

	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Stewart Jr., W. H., Watson, W. E., Carland, J. C., & Carland, J. W. (1999). A proclivity for entrepreneurship: A comparison of entrepreneurs, small business owners, and corporate managers. Journal of Business Venturing, 14(2), 189–214.	7.7	375	Clemson University	USA
Title	Davis, P. S., & Harveston, P. D. (1999). In the founder's shadow: Conflict in the family firm. Family Business Review, 12(4), 311–323.	9.9	248	Clemson University	USA
Author Keywords	Getz, D., & Carlsen, J. (2000). Characteristics and goals of family and owner-operated businesses in the rural tourism and hospitality sectors. Tourism Management, 21(6), 547–560.	0.62	437	University of Calgary	Canada
Index Keywords	NA (no highly cited article in 1992 or 2000)				

Source: Own Elaboration

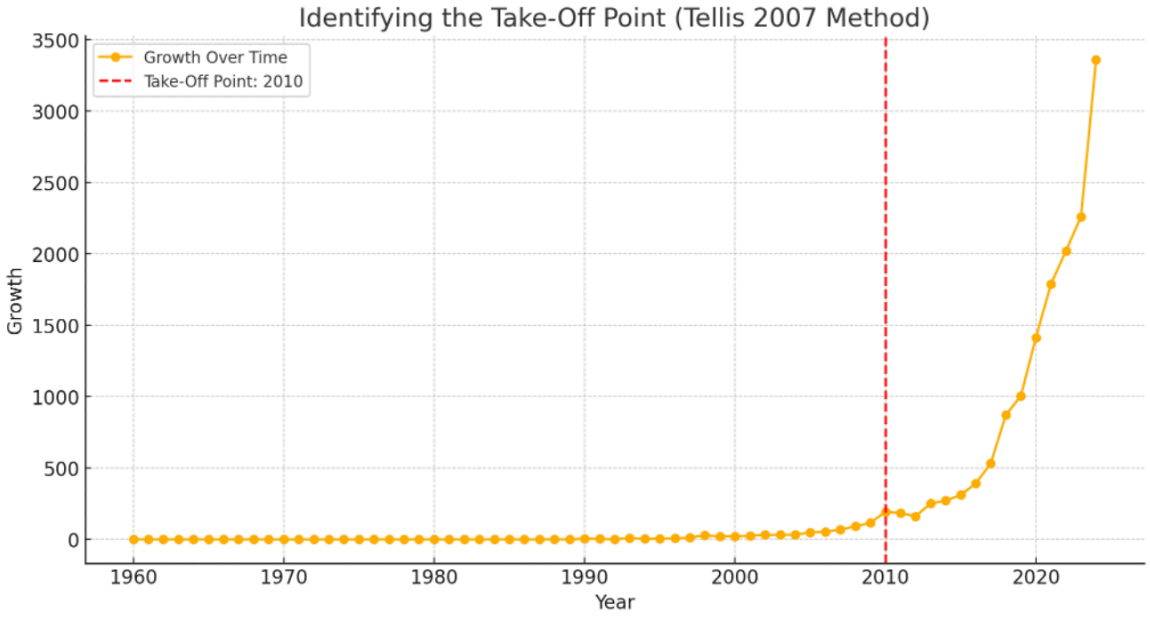
Sustainable Entrepreneurship

First Publications on Sustainable Entrepreneurship (Origin)

	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Starkie, D., & Starrs, M. (1984). Contestability and Sustainability in Regional Airline Markets. The Economic Record, 60(3), 274–283.	1.1	18	University Of Adelaide	Australia
Title	Crewe, L., & Hall-Taylor, M. (1991). The restructuring of the Nottingham Lace Market: Industrial relic or new urban model? Policy & Politics, 19(1), 14–30.	4.7	4	University of Nottingham	UK
Author Keywords	Hall, D. O., & House, J. I. (1994). Biomass energy and the global carbon balance. Renewable Energy, 5(1-4), 451–456.	8.64	8	King's College	Canada
Index Keywords	The Business of Sustainable Cities: Public-Private Partnerships for Creative Technical and Institutional Solutions. (1994). Proceedings of the 14th World Bank Agricultural Symposium. Washington, D.C.: The World Bank.	NA	4	Worldbank, Washington D.C	USA

Source: Own Elaboration

Annual Keyword Frequency in Article Abstracts for "Sustainable Entrepreneurship"



Source: ChatGPT **Take-Off Point: 2010**

Publications using the trend keywords in either abstract, title, author keywords, or indexed keywords in the two years before the take-off point (2008, 2009) with highest number of citations (Dissemination)

	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Huang, Y. (2008). Capitalism with Chinese Characteristics: Entrepreneurship and the State. Cambridge University Press.	NA	1080	MIT	USA
Title	Brown, H. S., de Jong, M., & Levy, D. L. (2009). Building institutions based on information disclosure: Lessons from GRI's sustainability reporting. Journal of Cleaner Production, 17(6), 571–580.	11.07	407	Clark University	USA
Author Keywords	Brown, H. S., de Jong, M., & Levy, D. L. (2009). Building institutions based on information disclosure: Lessons from GRI's sustainability reporting. Journal of Cleaner Production, 17(6), 571–580.	11.07	407	Clark University	USA
Index Keywords	Brown, H. S., de Jong, M., & Levy, D. L. (2009). Building institutions based on information disclosure: Lessons from GRI's sustainability reporting. Journal of Cleaner Production, 17(6), 571–580.	11.07	407	Clark University	USA

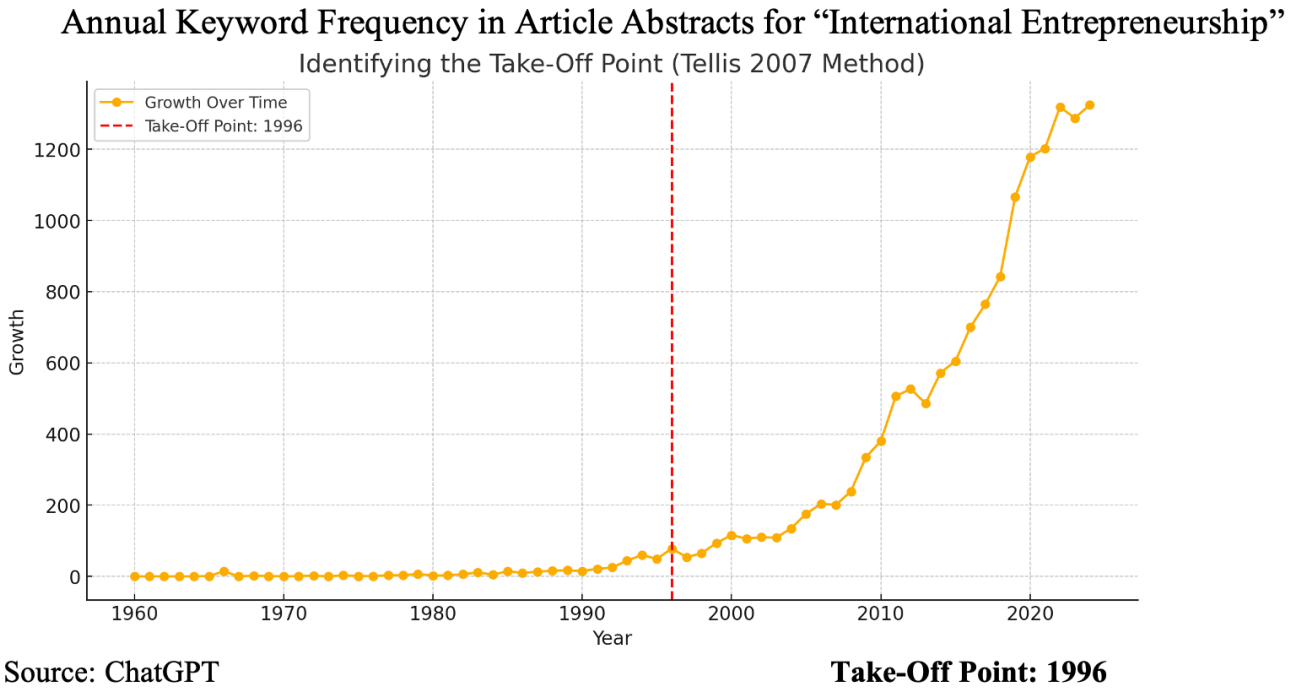
Source: Own Elaboration

International Entrepreneurship

First Publications on International Entrepreneurship (Origin)

	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Bond, E. W. (1986). Entrepreneurial ability, income distribution, and international trade. Journal of International Economics, 20(3-4), 343–356.	2	14	Vanderbilt University	Canada
Title	Britton, S. G. (1982). The Political Economy of Tourism in the Third World. Annals of Tourism Research, 9(3), 331–358.	9.011	712	University of Aukland	New Zealand
Author Keywords	Barclay, M. A. (1989). Factors Influencing International Entrepreneurship in the Hospitality Industry. Journal of Hospitality & Tourism Research, 13(3), 359–375.	4.2	0	Cornell University	USA
Index Keywords	NA				

Source: Own Elaboration



Source: ChatGPT **Take-Off Point: 1996**

Publications using the trend keywords in either abstract, title, author keywords, or indexed keywords in the two years before the take-off point (1994, 1995) with highest number of citations (Dissemination)

	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Oviatt, B. M., & McDougall, P. P. (1994). Toward a Theory of International New Ventures. Journal of International Business Studies, 25(1), 45–64.	11.38	2158	Georgia State University	USA
Title	Oviatt, B. M., & McDougall, P. P. (1994). Toward a Theory of International New Ventures. Journal of International Business Studies, 25(1), 45–64.	11.38	2158	Georgia State University	USA
Author Keywords	Coviello, N. E., & Munro, H. J. (1995). Growing the entrepreneurial firm: Networking for international market development. European Journal of Marketing, 29(7), 49–61.	7.6	688	University of Auckland	New Zealand
Index Keywords	NA				

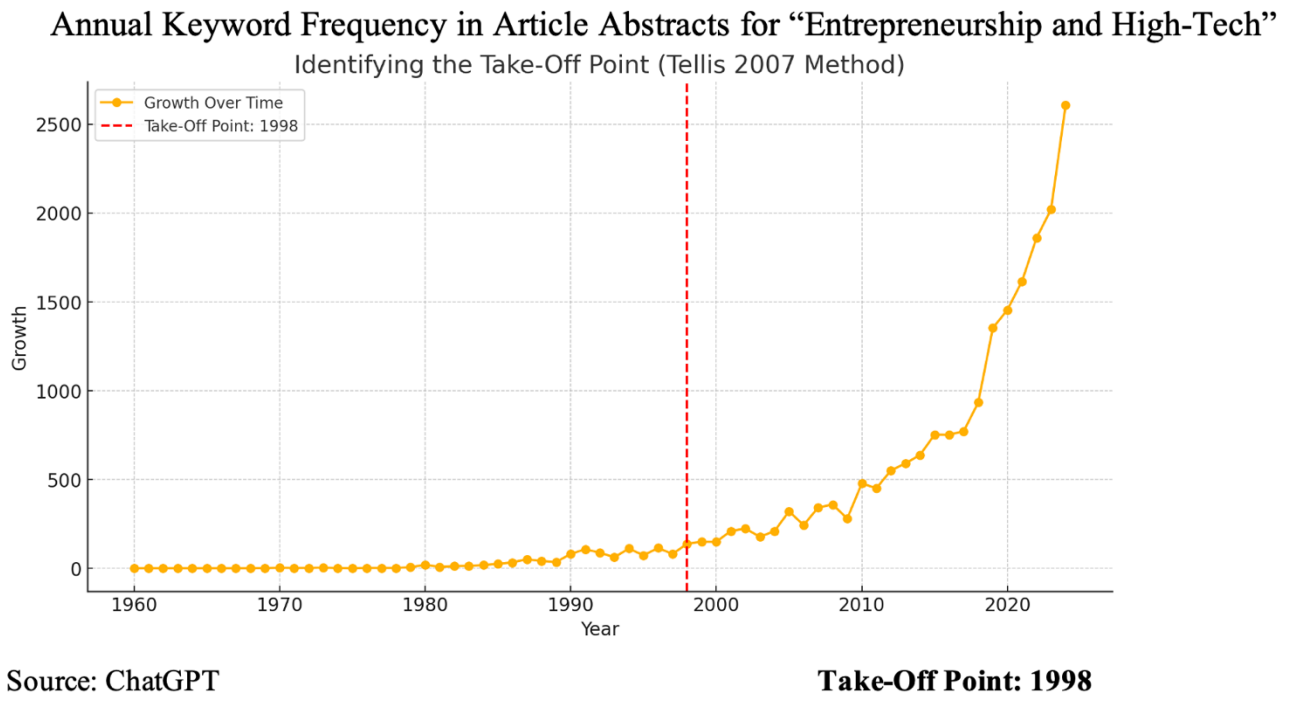
Source: Own Elaboration

Entrepreneurship and High-Tech

First Publications on Entrepreneurship and High-Tech (Origin)

	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Johnson, H. (1968). Education for Management and Technology in the 1970's: The universities and business must foster entrepreneurship and its interaction with technology. (1968). Science, 160(3828), 620.	47.73	3	MIT	USA
Title	Johnson, H. (1968). Education for Management and Technology in the 1970's: The universities and business must foster entrepreneurship and its interaction with technology. (1968). Science, 160(3828), 620.	47.73	3	MIT	USA
Author Keywords	M'Pherson, P. K. (1981). A framework for systems engineering design. The Radio and Electronic Engineer, 51(2), 59–93.	NA	14	City University	UK
Index Keywords	Wortmann, J. C. (1973). On the need of new concepts for production management. International Journal of Production Research, 11(3), 255–267.	9	1	University of Technology	Netherlands

Source: Own Elaboration



Source: ChatGPT

Take-Off Point: 1998

Publications using the trend keywords in either abstract, title, author keywords, or indexed keywords in the two years before the take-off point (1996, 1997) with highest number of citations (Dissemination)

	Publication	JIF (2023)	Citations	Affiliation	Country
Abstract	Eisenhardt, K. M., & Schoonhoven, C. B. (1996). Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms. Organization Science, 7(2), 136–150.	5	1439	Stanford University	USA
Title	Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. Academy of Management Journal, 39(6), 1713–1735.	11.8	803	Georgia State University	USA
Author Keywords	Brynjolfsson, E., & Hitt, L. M. (1996). Paradox Lost? Firm-Level Evidence on the Returns to Information Systems Spending. Management Science, 42(4), 541–558.	5.7	1400	MIT	USA
Index Keywords	Zahra, S. A. (1996). Technology strategy and new venture performance: A study of corporate-sponsored and independent biotechnology ventures. Journal of Business Venturing, 11(4), 289–321.	7.7	264	Georgia State University	USA

Source: Own Elaboration