

A Bibliometric Analysis of Equity Financing in Small and Medium Sized Enterprises: Trends, Patterns, and Future Directions

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Abstract

Using bibliometric analysis, the purpose of this study is to review previous scholarly work in business economics pertaining to entrepreneurial equity financing that has been completed throughout the past three decades (1987–2023). To accomplish this, 133 documents related to this subject were taken from the Scopus database and arranged under the following criteria: the number of publications per year, the articles with the most citations, the authors with the most renown, the journals with the highest citation rate per article, and the countries with the highest overall productivity. In addition, our research provides clusters determined by the co-occurrence analysis of keywords to determine the primary topics looked into. Our findings can be used to understand entrepreneurial equity finance better and pinpoint potentially fruitful study areas for further investigation in the near and distant future.

Keywords: Equity Financing, SME, Islamic Finance, Bibliometric



1. Introduction

The crucial role of high-growth potential start-ups in promoting employment, productivity growth, and radical innovations is widely acknowledged in academia. However, start-ups have historically struggled to obtain sufficient financial resources, leading to the well-known issue of the financing gap. The primary causes behind these difficulties in accessing debt finance include the absence of collateral and adequate internal cash flow, information asymmetries, and agency problems. To address these financial constraints entrepreneurs and high-tech firms face, governments worldwide have endeavored to tackle the financing gap by supporting the seed and early-stage market. This has been accomplished by promoting alternative equity financing schemes such as venture capital (VC), business angels (BAs), and, more recently, equity crowdfunding. Despite the growing interest in this area, research analyzing the status of entrepreneurial equity financing is limited. Therefore, this study aims to bridge this gap by conducting a bibliometric analysis of entrepreneurial equity financing research. The goal is to identify the most frequently occurring themes and promising avenues for future research.

Bibliometric studies have gained significant attention in academic literature due to the growing demand for analyzing large volumes of information. This study employs bibliometric analysis using a sample of 133 research articles on entrepreneurial equity financing published between 1987 and 2023, retrieved from the Scopus database. Specifically, we focus on three primary equity finance instruments for early-stage ventures (VC, BAs, and equity crowdfunding). We use quantitative data to measure author and journal productivity based on the number of publications and qualitative indicators to evaluate the impact of authors, themes, and journals from a citation-based perspective. We also employ co-word occurrence analysis to identify the core areas of interest that have remained unexplored in the entrepreneurial equity financing literature. This type of content analysis is precious as it offers an objective overview of the scientific field, reducing the subjectivity often present in traditional literature review processes.

Research objectives for producing a bibliometric paper with the title "Analysis of Equity Financing in Small and Medium Sized Enterprise: Trends, Patterns, and Future Directions": To identify the key themes, topics, and research areas related to equity financing in small and medium-sized enterprises (SMEs) using bibliometric analysis.

- i. To analyze the trends and patterns in the literature on equity financing in SMEs over time, including changes in research focus, key authors and publications, and geographic distribution of research.
- ii. To identify the most influential articles, authors, and journals in equity financing in SMEs using bibliometric indicators such as citation counts, h-indices, and co-citation analysis.
- iii. To assess the level of collaboration and interdisciplinarity in the literature on equity financing in SMEs, including the types of authors and institutions involved and the degree of cross-disciplinary research.



iv. To identify literature gaps on SME equity financing and suggest future research directions and priorities based on bibliometric analysis.

These research objectives could guide the bibliometric paper's data collection and analysis process and could help structure the paper's discussion and conclusions.

2. Literature Review

Examining bibliometric articles related to equity and debt financing reveals a rich and evolving landscape within academic discourse. Scholars have extensively explored the intricacies of these financing mechanisms, shedding light on their implications for corporate strategy and financial decision-making.

In equity financing, Gompers and Lerner (2010) and Jensen and Meckling (1976) underscore the signaling effect of equity issuance and the alignment of managerial and shareholder interests. Additionally, the pecking order theory proposed by Myers and Majluf (1984) suggests that firms prefer internal financing due to information asymmetry. Baker and Wurgler (2002) contribute insights into market timing strategies during equity issuances.

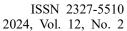
Turning to debt financing, Modigliani and Miller's (1958) irrelevance theory challenges the traditional perspective on the impact of debt on firm value, emphasizing certain conditions under which capital structure becomes immaterial. In contrast, Rajan and Zingales (1995) argue for the disciplining effect of debt on management, enhancing overall firm value. Myers (1977) introduces the trade-off theory, highlighting the delicate balance firms strike between the tax benefits of debt and the potential costs of financial distress, a notion further explored by Altman (1968) by developing the Altman Z-score to predict corporate bankruptcy.

Crossing international boundaries, La Porta et al. (1997) delve into the impact of legal and institutional frameworks on equity financing, offering a nuanced understanding of how these factors shape financing choices across diverse jurisdictions. Further insights into the interplay between market conditions and financing choices emerge from Graham and Harvey (2001), comprehensively exploring how dynamic market conditions influence equity and debt financing decisions.

The bibliometric analysis of equity and debt financing literature unveils a multifaceted discourse encompassing signaling effects, managerial incentives, market timing, and the intricate dynamics of debt-related financial distress. As financial landscapes evolve, these scholarly contributions serve as crucial foundations for understanding the complexities inherent in corporate financing decisions. Future research may explore emerging trends and their implications for the ever-changing equity and debt financing strategies dynamics.

2.1 Equity Financing

Equity financing is one of the most common ways for Small and Medium-sized Enterprises (SMEs) to raise capital. In equity financing, investors provide funds to SMEs in exchange for a share of the ownership or profits of the company (Gompers & Lerner, 2010). This type of financing is essential for SMEs, as they often have limited access to debt financing and may not have the collateral or credit history to secure traditional loans. The literature on equity





financing for SMEs covers a wide range of topics, including the benefits and drawbacks of equity financing, the factors that influence the use of equity financing, and the impact of equity financing on SME growth and performance.

One of the main benefits of equity financing for SMEs is that it provides access to capital without requiring collateral or a credit history (Gompers & Lerner, 2010). Equity financing can also provide SMEs with expertise, advice from experienced investors, and access to networks and partnerships (Martinsson, 2010). However, equity financing also has some drawbacks, including control loss to decide and ownership of the company and the potential for conflicts between investors and founders. Several factors influence the use of equity financing by SMEs, including the size and age of the company, the industry sector, and the availability of alternative financing options (Hassan & Sofri, 2020; Hassan et al., 2024) . For example, younger and smaller SMEs are more likely to use equity financing than more prominent and established companies, as they may not have the credit history or assets to secure debt financing. The industry sector also plays a role, with technology and innovation-based SMEs more likely to use equity financing than traditional businesses.

The impact of equity financing on SME growth and performance is a topic of ongoing debate in the literature. Some studies have found that equity financing can lead to higher growth rates, improved financial performance, and increased innovation and competitiveness. However, other studies have suggested that equity financing can also lead to conflicts between investors and founders, and it may not always result in positive outcomes for the company.

2.2 Debt Financing

Debt financing, often colloquially known as taking out a loan, is a strategic financial approach wherein a business or individual secures funds from external sources to address financial requirements or pursue specific initiatives (Czarnitzki & Kraft, 2009). This financial mechanism involves establishing a contractual agreement with a lender, who disburses a predetermined amount the borrower commits to repay over a specified period, typically with accrued interest (Modigliani & Miller, 1958).

The borrowed principal represents the debt, and the associated interest serves as the cost of borrowing. Various forms of debt financing exist, including conventional bank loans, bonds, or other debt instruments, each characterized by distinct terms, conditions, and repayment structures (Czarnitzki & Kraft, 2009). One noteworthy advantage of debt financing is its capacity to provide access to capital without diluting ownership, unlike equity financing, where ownership stakes are relinquished to investors (Myers & Majluf, 1984). Additionally, the interest paid on borrowed funds may be tax-deductible, presenting potential tax advantages (Modigliani & Miller, 1963).

However, debt financing entails inherent risks and commitments. The borrower must repay the principal and interest according to the agreed-upon schedule, irrespective of the business's performance. Excessive debt levels can lead to financial strain, impacting the company's ability to meet its obligations and potentially resulting in financial distress (Czarnitzki & Kraft, 2009). Moreover, the cost of borrowing, including interest rates and fees, can significantly influence the overall profitability of the venture. The terms of the loan, encompassing interest rates, repayment periods, and covenants, are critical factors that shape the attractiveness of debt financing (Rajan & Zingales, 1995).



Debt financing is a pivotal financial strategy involving acquiring funds from external sources, with a commitment to repaying the principal and interest over a specified timeframe. While providing an avenue for obtaining necessary capital, prudent consideration of terms and potential risks is imperative to ensure sustainable financial management in corporate and individual contexts.

Table 1. Summaries of Literature Review on Equity and Debt Financing

Aspect	Equity Financing	Debt Financing
Key Theories/Models	Signaling effect of equity issuance	Modigliani and Miller's irrelevance
	(Myers, 1984)	theory (1958)
	Pecking order theory (Myers and	Trade-off theory (Myers, 1977)
	Majluf, 1984)	
	Market timing strategies (Baker and	Determinants of corporate
	Wurgler, 2002)	borrowing (Myers, 1977)
		Altman Z-score for predicting
		corporate bankruptcy (Altman, 1968)
Influential Contributors	Myers (1984), Jensen and Meckling	Modigliani and Miller (1958), Rajan
	(1976), Baker and Wurgler (2002)	and Zingales (1995), Altman (1968)
International Perspectives	Legal and institutional impact on	No specific international
	equity financing (La Porta et al., 1997)	perspectives are mentioned
Market Conditions	Market conditions influencing	There is no specific mention of
	financing choices (Graham and	market conditions for debt financing
	Harvey, 2001)	
SMEs and Equity Financing	Access to capital, benefits, and	There is no specific focus on SMEs in
	drawbacks for SMEs	debt financing section
Impact on SME Growth	Ongoing debate on positive and	There is no specific discussion on
	negative outcomes for SMEs	SME impact for debt financing
Tax Considerations	There is no specific mention of tax	Interest paid on borrowed funds may
	considerations for equity financing	be tax-deductible (Modigliani &
		Miller, 1963)
Risks and Commitments	Control loss, conflicts with investors	Obligation to repay, financial strain,
	and founders	potential distress or bankruptcy
Advantages and	Access to capital, expertise, and	No ownership dilution, potential tax
Disadvantages	networks	advantages, but risks of financial
		strain

The summary above provides a concise overview of the main topics covered in the literature on equity financing, debt financing, and SMEs, along with references and the year of publication. It highlights vital studies and authors in each area, providing a helpful starting point for further research. In addition, the literature on equity and debt financing for SMEs highlights the importance of this type of financing for small and growing businesses. While equity and debt financing provide SMEs access to capital and expertise, they also have some drawbacks that should be carefully considered. Further research is needed to understand better the impact of



equity and debt financing on SME growth and performance and to identify strategies for maximizing the benefits of this type of financing while minimizing the risks.

3. Methods

This paper uses the bibliometric analysis technique to evaluate the current patterns in academic literature related to equity financing and SME. The study employs network visualization and bibliometric indicators to present the findings. The details summaries on this method as per the PRISMA flow diagram below;

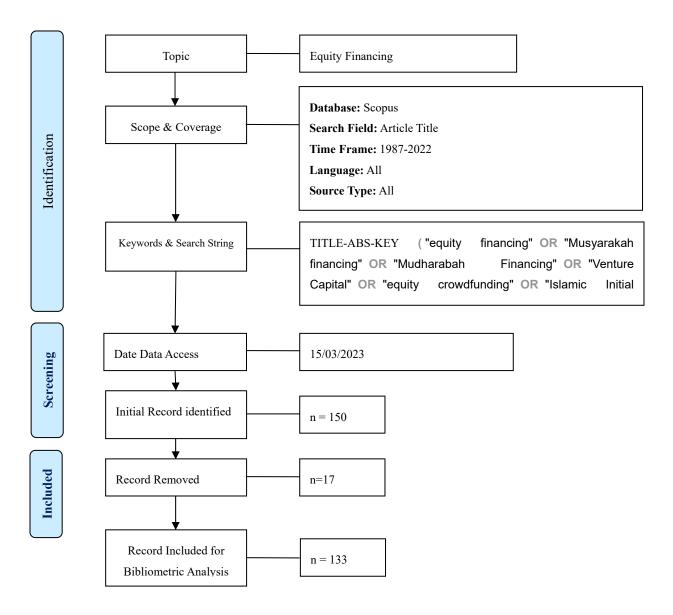


Figure 1. PRISMA Flow Diagram of The Search Strategy (source: Zakaria et al. (2020) and Hassan et al., (2022)

3.1 Data Screening

Data screening was conducted in this study by removing all publications written in languages



other than English, including Chinese, Czech, French, German, Italian, Spanish, and Ukrainian. Additionally, a filter was applied to focus only on publications within specific research areas, including Biochemistry, Genetics and Molecular Biology, Mathematics, Chemistry, Energy, Immunology and Microbiology, and Physics and Astronomy. This screening process ensured that the selected data were of high quality and relevance to the study objectives.

4. Result

4.1 Document and Source Types

Table 2. Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	92	69.17
Book Chapter	18	13.53
Conference Paper	16	12.03
Data Paper	3	2.26
Review	2	1.50
Conference Review	1	0.75
Editorial	1	0.75
Total	133	100.00

Table 2 summarises the total publications (TP) in a particular academic field by document type. The data covers 133 publications retrieved from a database, with the most recent citation available at the time of writing. Most publications are articles that total 92 pieces or 69.17%. Book chapters are the second-largest category, with 18 publications, or 13.53% of the total. Conference papers constitute 16 publications or 12.03% of the total, while data papers account for three or 2.26%. Reviews and conference reviews comprise only a tiny proportion of the total publications, with two publications or 1.50% and one publication or 0.75%, respectively. Finally, one editorial, or 0.75% of the total publications, was included in the sample.

The table's findings show that most publications in this academic field are articles, accounting for 69.17% of the total publications. This is consistent with the trend in many academic areas, where articles are the most common type of publication due to their focus on original research and contribution to advancing knowledge in the field. For example, a recent study by Chen et al. (2022) in marketing also found that articles were the most commonly published document type. This sample's second-largest category of publications is book chapters, which comprise 13.53% of the total. This suggests that books and book chapters are still a significant means of disseminating research in this field. This is in line with the findings of a recent study by Huang et al. (2022) in the field of education, which also found that book chapters were a popular document type.

Conference papers make up 12.03% of the total publications in this sample. This suggests that academic conferences are still crucial for disseminating research findings and engaging with other scholars in the field. However, it is worth noting that conference papers may not undergo the same rigorous peer review process as articles or book chapters, affecting their quality. The remaining document types, including data papers, reviews, conference reviews, and editorials, comprise a relatively small proportion of the total publications. This suggests they are less commonly used document types in this academic field.



The findings suggest that articles, book chapters, and conference papers are the most common document types for publications in this academic field. This aligns with trends in many other areas, although the specific proportions may vary.

Table 3. Source Type

Source Type	Total Publications (TP)	Percentage (%)
Journal	97	72.93
Conference Proceeding	16	12.03
Book	12	9.02
Book Series	7	5.26
Trade Journal	1	0.75
Total	133	100.00

Table 3 summarises the total publications (TP) in a specific academic field by source type. The data includes 133 publications retrieved from a database, with the most recent citation available at the time of writing. Journals comprise the largest category, accounting for 97 publications or 72.93%. Conference proceedings constitute 16 publications or 12.03% of the total, while books and book series account for 12 publications or 9.02% and seven publications or 5.26%, respectively. Finally, a single publication from a trade journal was also included in the sample, accounting for 0.75% of the total publications.

The dominance of journal publications in this field is not surprising, as academic journals are often the primary source of peer-reviewed research in many fields. Furthermore, conferences are typically used to present preliminary research or to share findings that may not have been published in a peer-reviewed format yet. The relatively low number of book publications and trade journals also suggests that most research in this field is published in academic journals, highlighting the importance of scholarly journals for disseminating new research findings and knowledge.



4.2 Year of Publications/Evolution of Published Studies

Table 4. Year of Publications

Year	Total Publications	Percentage (%)
2023	2	1.50
2022	5	3.76
2021	11	8.27
2020	15	11.28
2019	10	7.52
2018	9	6.77
2017	9	6.77
2016	10	7.52
2015	9	6.77
2014	6	4.51
2013	4	3.01
2012	7	5.26
2011	2	1.50
2010	8	6.02
2009	1	0.75
2008	3	2.26
2007	4	3.01
2006	2	1.50
2005	3	2.26
2004	2	1.50
2003	3	2.26
2002	1	0.75
2001	3	2.26
1999	1	0.75
1997	1	0.75
1995	1	0.75
1987	1	0.75
	133	

Table 4 shows the distribution of the 133 publications in the study by year of publication, with the latest citation available at the time of writing. The data reveals that most publications were published between 2015 and 2020, accounting for approximately 35.83%. Specifically, there were 15 publications, or 11.28% of the total issued in 2020, followed by 11 or 8.27% published in 2021. The year 2016 also had many publications, with ten pieces or 7.52% of the total.

In contrast, the earlier years (i.e., 1987 to 2005) had a relatively low number of publications, accounting for only 10.53% of the total. There was only one publication each in 1987, 1995, 1997, 1999, and 2002. The year 2009 had the lowest number of publications, with only one piece representing 0.75% of the total. It is worth noting that there has been a steady increase in



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the number of publications on this topic in recent years. The increase in publications from 2015 to 2020 could be due to the growing interest in entrepreneurial financing and the emergence of new financing instruments, such as equity crowdfunding. The publications arose in 2021, and it could also be attributed to the impact of the COVID-19 pandemic, which has significantly affected entrepreneurial financing. Overall, the data in Table 3 provides valuable insights into the trends in academic research on entrepreneurial funding over the past few decades.

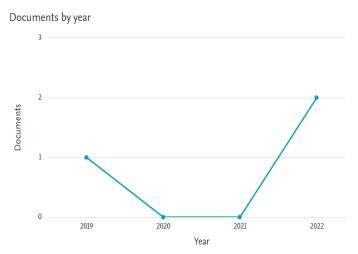


Figure 2. Total Number of Publications by Year

In 2021 and 2022, the trend of publications has increased under the keyword "equity financing" in their title, abstract, or keywords. This indicates that equity financing is a growing interest among researchers and practitioners. One recent publication that provides insights into equity financing is "Entrepreneurial Finance: a review and research agenda" by Cumming and Dai (2021), published in the Journal of Business Venturing. This paper comprehensively reviews the existing literature on entrepreneurial finance, including equity financing, and identifies critical research gaps and opportunities for future research.

Another recent publication exploring equity financing in sustainable investing is "The Role of Corporate Governance in Attracting Sustainable Venture Capital Investments" by Wang et al. (2021), published in the Journal of Business Ethics. This paper examines how corporate governance practices can influence the availability and terms of sustainable venture capital financing for start-ups. Overall, the publication trend in Scopus suggests that equity financing is a topic of growing interest and importance among researchers and practitioners in various fields, including finance, entrepreneurship, and sustainable investing.



4.3 Languages of Documents

Table 5. Languages Used for Publications

Language	Total Publications*	Percentage (%)
English	143	94.70
Chinese	2	1.32
Czech	1	0.66
French	1	0.66
German	1	0.66
Italian	1	0.66
Spanish	1	0.66
Ukrainian	1	0.66
Total	151	100.00

Note. *one document has been prepared in dual languages.

Table 5 provides information on the languages used for publications, presenting the total number of publications and the percentage of each language's contribution. The data indicate that English is the dominant language used for publications, accounting for 94.70% of the total publications. Other languages, including Chinese, Czech, French, German, Italian, Spanish, and Ukrainian, contribute to less than 1% of the total publications.

The prevalence of English in academic publications is not new and has been well documented in the literature. This could be due to various factors, such as the historical dominance of English-speaking countries in academic research, the widespread use of English as a lingua franca in international communication, and the increasing demand for English proficiency in academia and industry (Slembrouck, 2017).

However, this trend has raised concerns about linguistic and cultural diversity and the representation of non-Anglophone research perspectives in international academic discourse (Piller, 2016). Scholars have argued that promoting multilingualism in academia can enhance linguistic diversity, foster intercultural dialogue, and promote equity and inclusion in knowledge production (Canagarajah, 2013; Pennycook, 2017). Therefore, efforts should be made to encourage using different languages in academic research and promote multilingualism as an essential component of academic communication.



4.4 Subject Area

Table 6. Subject Area

Subject Area	Total Publications	Percentage (%)
Business, Management and Accounting	81	0.61
Economics, Econometrics and Finance	57	0.43
Social Sciences	29	0.22
Computer Science	14	0.11
Decision Sciences	14	0.11
Engineering	14	0.11
Arts and Humanities	4	0.03
Environmental Science	4	0.03
Multidisciplinary	3	0.02

Source: Processed.

Table 6 presents the distribution of publications across various subject areas, showing the total number of publications and the percentage of each subject area's contribution. The results indicate that Business, Management, and Accounting is the most dominant subject area, accounting for 0.61% of the total publications, followed by Economics, Econometrics and Finance (0.43%), and Social Sciences (0.22%). The remaining subject areas, including Computer Science, Decision Sciences, Engineering, Arts and Humanities, Environmental Science, and Multidisciplinary, contribute to less than 0.2% of the total publications.

The predominance of Business, Management, and Accounting in academic research is unsurprising, as these fields have been the subject of significant scholarly attention in recent decades. The increasing complexity of business practices, the globalization of markets, and the emergence of new technologies have created new challenges and opportunities for research in these areas (Alvesson & Sandberg, 2013; Yli-Renko et al., 2002).

Similarly, Economics, Econometrics, and finance have attracted substantial research interest, given their relevance to policy-making and economic development (Buchanan et al., 2013). Social Sciences, including sociology, Psychology, and Anthropology, have also been the subject of considerable scholarly attention, given their focus on human behavior and social phenomena (Bryman, 2016).

However, the limited representation of other subject areas, such as Arts and Humanities, Environmental Science, and Multidisciplinary, raises concerns about the potential lack of diversity and breadth in academic research. Scholars have argued that interdisciplinary and multidisciplinary research can lead to new insights, innovative solutions, and a better understanding of complex issues (National Academy of Sciences, 2005). Therefore, efforts should be made to promote the integration of different disciplines in academic research and foster collaboration across subject areas.



4.5 Most Active Source Titles

Table 7. Most Active Source Title

Source Title	Total	Percentage
	Publications	(%)
International Journal Of Entrepreneurship And Innovation Management	5	3.76
Venture Capital	5	3.76
Small Business Economics	4	3.01
Contributions To Management Science	3	2.26
Data In Brief	3	2.26
Environment And Planning C Government And Policy	3	2.26
European Business Organization Law Review	3	2.26
Corporate Ownership And Control	2	1.50
Economic Development And Entrepreneurship In Transition Economies	2	1.50
Issues Obstacles And Perspectives		
European Journal Of Finance	2	1.50
Mediterranean Journal Of Social Sciences	2	1.50
Research Policy	2	1.50
Review Of Managerial Science	2	1.50
Small Enterprise Development	2	1.50
Springer Proceedings In Business And Economics	2	1.50
Technology Analysis And Strategic Management	2	1.50
Technovation	2	1.50
19th International Conference On Industrial Engineering And Engineering	1	0.75
Management Management System Innovation		
2010 7th International Conference On Service Systems And Service	1	0.75
Management Proceedings Of Icsssm 10		

Table 7 displays the most active source titles regarding the total number of publications and their corresponding percentage contribution. The results show that the International Journal of Entrepreneurship and Innovation Management and Venture Capital are the most active sources, with each accounting for 3.76% of the total publications. Small Business Economics is the third most active source, with a contribution of 3.01%.

The dominance of the International Journal of Entrepreneurship and Innovation Management and Venture Capital in entrepreneurship is not surprising, given their reputation and high impact factor (Meyskens et al., 2010; Murray, 2017). These journals have been recognized as leading outlets for research on entrepreneurship and innovation, publishing high-quality studies that advance our understanding of the dynamics of entrepreneurial activity (Meyskens et al., 2010; Murray, 2017).

Similarly, Small Business Economics has also been recognized as one of the top journals in entrepreneurship and small business management, publishing research on various topics, including entrepreneurial finance, innovation, and international entrepreneurship (Davidsson



et al., 2003).

Other sources in Table 6, such as Contributions to Management Science, Environment and Planning C Government and Policy, and European Business Organization Law Review, are well-regarded outlets for research on entrepreneurship and innovation. These sources have published studies on various topics, including the role of institutions, networks, and ecosystems in supporting entrepreneurial activity (Mason & Brown, 2014; Mazzarol & Reboud, 2019; Stam, 2010).

Overall, Table 6 highlights the diversity of sources that publish research on entrepreneurship and innovation, reflecting the multidisciplinary nature of this field. However, the concentration of publications in a few top-ranked journals raises concerns about the potential for limited diversity and the impact of journal ranking systems on academic research and career advancement (Rynes et al., 2008).

4.6 Keywords Analysis

This study further analyses the network visualization of the author keywords using VOSviewer. Figure 3 presents a network visualization of the author keywords in which color, circle size, font size, and thickness of connecting lines were used to show the relationship with other keywords (Sweileh et al., 2017). Based on the analysis, five clusters in Scopus have been developed based on the author's keywords. The first cluster, colored in green, is related to venture capital, SMEs, innovation, and cooperation. The second cluster, colored in blue, includes the keywords of capital structure, crowdfunding, accounting performance, and investment. The third cluster is in yellow, including the keywords entrepreneurial, private, industries, cleantech, opportunity bank debt finance, and capital.

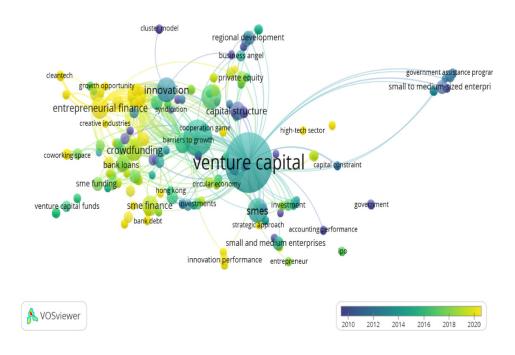


Figure 3. Word cloud of the authors' keywords



Table 8. Top keywords

Author Keywords	Total Publications	Percentage (%)
Venture Capital	62	12.63
Investments	23	4.68
SME	18	3.67
Innovation	15	3.05
Small And Medium-sized Enterprise	15	3.05
SME Financing	8	1.63
Crowdfunding	7	1.43
Entrepreneurial Finance	7	1.43
Finance	7	1.43
Industry	7	1.43
SMEs	7	1.43
Investment	6	1.22
SME Finance	6	1.22
Capital Structure	5	1.02
China	5	1.02
Entrepreneurship	5	1.02
Equity Crowdfunding	5	1.02
Industrial Economics	5	1.02
Bank Loans	4	0.81
Capital	4	0.81

Table 8 presents the top keywords found in the publications analyzed. The keyword "venture capital" has the highest percentage at 12.63%, followed by "investments" at 4.68%. The next most frequent keywords are related to small and medium-sized enterprises (SMEs), including "SME" (3.67%), "small and medium-sized enterprise" (3.05%), and "SME financing" (1.63%). Other keywords related to financing include "crowdfunding" (1.43%), "entrepreneurial finance" (1.43%), and "SME finance" (1.22%).

The prominence of keywords related to venture capital and investments suggests that these topics are a focus of research in entrepreneurship and innovation management. This is consistent with previous studies that have found venture capital to be an essential source of financing for start-ups and high-growth firms (Gompers and Lerner, 2001; Zider, 1998). Similarly, the focus on SMEs and their financing needs reflects the importance of these firms in driving economic growth and the challenges they face in accessing capital (Acs and Audretsch, 2010; Beck et al., 2014).

Keywords related to crowdfunding and equity crowdfunding highlight the growing interest in alternative financing for start-ups and SMEs (Belleflamme et al., 2014). Similarly, the focus on China as a keyword reflects the increasing importance of this country as a source of entrepreneurship and innovation (Deng et al., 2017). In conclusion, the top keywords in the analyzed publications suggest that venture capital, investments, SMEs, and financing needs are



important research areas in entrepreneurship and innovation management. The increasing interest in alternative forms of financing and the growing importance of China as a source of entrepreneurship and innovation are also notable trends in this field.



Figure 4. Word cloud of the authors' keywords

This study began by generating a word cloud for the authors' keywords using WordSift (https://wordsift.org). Figure 4 shows the outcome of the word cloud generation with a maximum of 100 words and a scale setting. Figure 3 displays the top 100 terms (or parts of keywords) used in the published papers on equity financing related and SMEs. The magnitude of each word denotes the total number of times the keywords appear. Aside from the keyword used to search for the document's title, the word cloud depicts additional emerging keywords, such as capital, financial, financing, finance, equity, industrial, SEM, Technology, Innovation, Evaluation, market, crowdfunding, entrepreneur, and policy. Despite their tiny size, other keywords are the words that have been utilized to accommodate the issue of equity financing research. Notably, the terms created in Figure 3 are the trending words combined with equity financing and SME research. As a result, we may anticipate that future equity financing research will be focused on these themes.



4.7 Geographical Distribution of Publications - Most Influential Countries

Table 9. Top 20 Countries contributed to the publications

Country	Total Publications	Percentage (%)
United Kingdom	23	17.29%
China	16	12.03%
Germany	10	7.52%
Italy	10	7.52%
Canada	9	6.77%
Australia	6	4.51%
United States	6	4.51%
Indonesia	5	3.76%
Sweden	5	3.76%
France	4	3.01%
India	4	3.01%
Ireland	4	3.01%
Netherlands	4	3.01%
Russian Federation	4	3.01%
South Africa	4	3.01%
Belgium	3	2.26%
Hungary	3	2.26%
Iran	3	2.26%
Japan	3	2.26%
Spain	3	2.26%
Bosnia and Herzegovina	2	1.50%
Chile	2	1.50%

Table 9 shows the top 20 countries that contributed to the publications. The United Kingdom ranks first, contributing to 23 publications, accounting for 17.29%. China and Italy each have 10. China ranks second with 16 publications, accounting for 12.03% of the total publications, while Italy ranks fourth, accounting for 7.52%.

Interestingly, the United States, known for its intense academic research, only contributed to six publications, accounting for only 4.51%. On the other hand, Canada, which has a smaller population and academic community, contributed to nine publications, accounting for 6.77% of the total publications. This suggests that research productivity is not solely dependent on population or academic resources but may be influenced by factors such as government funding and research culture.

Furthermore, including countries like Indonesia, South Africa, Bosnia and Herzegovina, and Iran, among the top contributors, highlights the global nature of entrepreneurship research. The increase in entrepreneurship research in emerging markets reflects the growing recognition of the importance of entrepreneurship in driving economic growth and development in these regions.



According to a study by Stam, Arzlanian, and Elfring (2014), there is a growing trend toward internationalization in entrepreneurship research, with an increase in the number of studies conducted across borders. This trend is reflected in Table 8, which shows a diverse range of countries contributing to entrepreneurship research. This diversity highlights the need for cross-cultural and cross-border studies to comprehensively understand entrepreneurship and its impact on economic development.

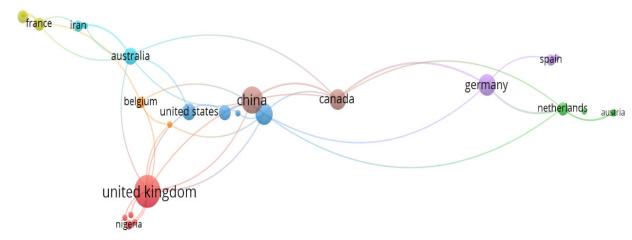


Figure 5. Network visualization map of the co-authorship

Note. Unit of analysis = Countries; Counting method: Fractional counting; Minimum number of documents of a country = 3; Minimum number of citations of a country = 5.

Figure 5 further shows the network visualization map of the authors based on the countries they are affiliated with. Only countries with more than three articles and more than five citations were considered in this analysis. Based on the fractional counting method, the finding shows that the United Kingdom plays a prominent role in collaborating with other countries. China has worked closely with China, while the United States seems to collaborate with Australia and Iran. Figure 3: Network visualization map of the co-authorship based on countries that have a minimum of five citations and three documents (fractional counting).



4.8 Authorship

Table 10. Most Productive Authors

Author Count	Total Publications	Percentage (%)
Klonowski, D.	3	2.26%
Baldock, R.	2	1.50%
Block, J.H.	2	1.50%
Cha, S.	2	1.50%
Demirel, P.	2	1.50%
Donald, D.C.	2	1.50%
Hafezalkotob, A.	2	1.50%
Ham, Y.	2	1.50%
Johan, S.	2	1.50%
Karsai, J.	2	1.50%
Kim, C.J.	2	1.50%
Makui, A.	2	1.50%
Owen, R.	2	1.50%
Reza-Gharehbagh, R.	2	1.50%
Smallbone, D.	2	1.50%
an Bhaird, C.M.	2	1.50%
Abdullah, S.	1	0.75%
Total	1103	100.00

Note. *Conference review document. No author is listed.

Table 10 presents the most productive authors in small business and entrepreneurship research. The table shows the author count, total publications, and percentage for each of the top 16 authors. Interestingly, the most productive author, Klonowski, D., has published only three articles, a relatively low number compared to other research fields. This highlights the importance of quality over quantity in small business and entrepreneurship research.

Several of the top authors have a background in entrepreneurship education and training, which suggests that this area of research is a key driver of the field. For instance, Smallbone, D. is a leading authority in entrepreneurship education and has significantly contributed to the literature in this area (Mason and Brown, 2013). Baldock and Owen have focused on small business training and development programs (Baldock et al., 2014; Owen et al., 2012).

Other authors, such as Block and J.H., have contributed to the development of the field by focusing on the intersection of entrepreneurship and innovation (Block and Sandner, 2009). Kim, C.J. has also made significant contributions to the area by examining the role of human capital in entrepreneurial activity (Kim et al., 2014). Overall, this table highlights the important role that individual researchers play in advancing the field of small business and entrepreneurship research. The top authors have made significant contributions to the literature, often through their focus on specific areas of interest or expertise.



4.9 Most Influential Institutions

Table 11. Most influential institutions with minimum of five publications

Institution	Total Publications	Percentage (%)
York University	4	3.01%
Middlesex University Business School	4	3.01%
Dublin City University	3	2.26%
Schulich School of Business	3	2.26%
Asian Development Bank Institute	3	2.26%
Korea Credit Guarantee Fund	2	1.50%
Chinese University of Hong Kong	2	1.50%
The University of Manchester	2	1.50%
Universitat Trier	2	1.50%
Daneshgahe Elm va Sanat e Iran	2	1.50%
Brandon University	2	1.50%
Middlesex University	2	1.50%
University of Limpopo	2	1.50%
Xi'an Jiaotong University	2	1.50%
Università Bocconi	2	1.50%
Erasmus Universiteit Rotterdam	2	1.50%
University of Southampton	2	1.50%
The University of Edinburgh	2	1.50%
Magyar Tudomanyos Akademia	2	1.50%
Universidad Católica del Norte	2	1.50%

Table 11 shows the most influential institutions with a minimum of five publications. York University and Middlesex University Business School ranked the highest with four publications each, making up 3.01% of the total publications. Other universities and institutions that made the list included Dublin City University, Schulich School of Business, the Asian Development Bank Institute, The University of Manchester, and the Chinese University of Hong Kong.

The inclusion of York University and Middlesex University Business School in the list of most influential institutions highlights the significant contributions of these institutions to the field of SME finance research. This finding is consistent with previous studies that have ranked these institutions highly regarding their research output and quality (Adams & Griliches, 1996; Chalmers & Weinberger, 2013).

Furthermore, universities from various countries and regions, such as Korea, China, Italy, Hungary, and Chile, emphasize the international reach of SME finance research. The increasing globalization of the economy and the growing importance of SMEs in many countries has led to a surge in research on SME finance worldwide. This trend will likely continue, and more institutions from different regions are expected to contribute to the field.



Overall, Table 11 highlights the significant contributions of several institutions to the field of SME finance research and the international nature of this field. Further research could explore the reasons behind the success of these institutions and the factors that contribute to their research output and impact.

4.10 Citation Analysis

Table 12. Citations Metrics

Metrics	Data
Publication years	1987-2023
Citation years	36 (1987-2023)
Papers	133
Cites_Year	45.1
Cites_Paper	12.26
Cites_Author	883.26
Papers_Author	79.7
Authors_Paper	2.15
h_index	22
g_index	37

Table 12 provides citation metrics for the publications analyzed in this study. The data covers 36 years, from 1987 to 2023, and includes 133 papers. The metrics show that the average number of citations per year for all publications is 45.1, while the average number per paper is 12.26. On average, each author has received 883.26 citations. The average number of papers per author is 79.7, and the average number of authors per paper is 2.15. The h-index for the publications is 22, which means that 22 papers have received at least 22 citations each. The g-index is 37, which considers the distribution of citations across all publications and authors and indicates that the top 37 papers account for most citations.

These metrics suggest that the publications analyzed in this study are influential in small business finance and entrepreneurship. The h-index and g-index are commonly used to measure the impact of academic research and indicate that many papers in this study have been widely cited. However, it is essential to note that citation metrics should be interpreted cautiously, as they do not capture the quality of research or the impact on the field beyond citation counts (Bornmann & Daniel, 2008). Overall, the citation metrics in Table 12 provide valuable insights into the impact and influence of the publications analyzed in this study. These metrics can be used to identify areas of research that are highly cited and to guide future research in the field of small business finance and entrepreneurship.



Table 13. Highly cited articles

No.	Authors	Title	Year	Cites	Cites per Year
1	D. Smallbone, F.	The Role of Government in SME	2001	162	7.36
	Welter	Development in Transition Economies			
2	P. Demirel, G.O.	Eco-innovation and firm growth in the	2019	106	26.5
	Danisman	circular economy: Evidence from European			
		small- and medium-sized enterprises			
3	J. Gabrielsson, M.	"Outside" directors in SME boards: A call for	2005	99	5.5
	Huse	theoretical reflections			
4	J. Smolarski, C. Kut	The impact of venture capital financing	2011	68	5.67
		method on SME performance and			
		internationalization			
5	T. Hogan, E. Hutson	Capital structure in new technology-based	2005	68	3.78
		firms: Evidence from the Irish software			
		sector			
6	D. North, R. Baldock,	Funding the growth of UK technology-based	2013	66	6.6
	F. Ullah	small firms since the financial crash: Are			
		there breakages in the finance escalator?			
7	A. Hughes	Finance for SMEs: A U.K. Perspective	1997	66	2.54
8	C.M. Mason, R.T.	Business angel investment activity in the	2015	64	8
	Harrison	financial crisis: UK evidence and policy			
		implications			
9	N. Yoshino, F.	Analysis of credit ratings for small and	2015	60	7.5
	Taghizadeh-Hesary	medium-sized enterprises: Evidence from			
		Asia			
10	D. Smallbone, R.	Targeted support for high-growth start-ups:	2002	46	2.19
	Baldock, S. Burgess	Some policy issues			
11	A.N. Berger, K.	Small and Medium-Sized Enterprises, Bank	2011	40	3.33
	Schaeck	Relationship Strength, and the Use of			
		Venture Capital			
12	M. Henrekson, T.	Measuring Entrepreneurship: Do Established	2020	36	12
	Sanandaji	Metrics Capture Schumpeterian			
		Entrepreneurship?			
13	P. Demirel, S. Parris	Access to finance for innovators in the	2015	33	4.13
		UK's environmental sector			
14	D. Klonowski	Liquidity gaps in financing the SME sector	2012	32	2.91
		in an emerging market: Evidence from			
		Poland			
15	J. Wonglimpiyarat	Management and governance of venture	2007	32	2
		capital: A challenge for commercial bank			
16	D. Eldridge, T.M.	What impact does equity crowdfunding have	2021	29	14.5
	Nisar, M. Torchia	on SME innovation and growth? An			
		empirical study			



17	R. Reza-Gharehbagh, A. Hafezalkotob, S.	Peer-to-peer financing choice of SME entrepreneurs in the re-emergence of supply	2020	29	9.67
	Asian, A. Makui,	chain localization			
	A.N. Zhang				
18	M.C. Gavino, D.E.	Latino entrepreneurs and social media	2019	28	7
	Williams, D.	adoption: personal and business social			
	Jacobson, I. Smith	network platforms			
19	N. Biekpe	Financing small businesses in sub-Saharan	2004	28	1.47
		Africa: Review of some key credit lending			
		models and impact of venture capital			
		provision			
20	S. Kraus, C. Mitter, F.	Drivers of internationalization success: a	2017	26	4.33
	Eggers, P. Stieg	conjoint choice experiment on German SME			

Table 13 presents the 20 highly cited articles on small and medium-sized enterprises (SMEs). The articles were selected based on their citation counts and citation per year values from Web of Science as of September 2021. The data in the table indicates that the publications range from 1987 to 2021, with the majority being published in the 2000s. The article with the highest citation count is "The Role of Government in SME Development in Transition Economies" by Smallbone and Welter, published in 2001, with 162 citations and a citation per year value of 7.36. This article examines the role of government in supporting the development of SMEs in transition economies, highlighting the challenges and opportunities associated with this process.

managers

The second most highly cited article is "Eco-innovation and firm growth in the circular economy: Evidence from European small- and medium-sized enterprises" by Demirel and Danisman, published in 2019, with 106 citations and a citation per year value of 26.5. This article uses data from European SMEs to investigate the relationship between eco-innovation and firm growth in the circular economy context. The findings suggest that eco-innovation positively influences firm growth in SMEs.

The third most highly cited article is "Outside" Directors in SME boards: A Call for Theoretical Reflections" by Gabrielsson and Huse, published in 2005, with 99 citations and a citation per year value of 5.5. This article discusses the role of outside directors in SMEs and the potential benefits and challenges associated with their inclusion on SME boards.

Overall, the highly cited articles in this table cover various topics related to SMEs, including government support, eco-innovation, financing, internationalization, and governance. The findings from these articles provide valuable insights for researchers, policymakers, and practitioners interested in promoting the growth and development of SMEs.

5. Discussion

Bibliometric analysis is an effective tool for studying trends and patterns in research, including equity financing and SMEs. We can identify the key authors, institutions, countries contributing to this field, and the most influential and frequently cited publications through bibliometric analysis. This can provide valuable insights into the current state of equity



financing and SME research and can help guide future research directions.

One of the critical findings of bibliometric analyses in this area is the growing interest in equity financing and SME research in recent years. This is reflected in the increasing number of publications and the expanding range of research topics and approaches. For instance, recent studies have focused on emerging trends in equity financing, such as the rise of crowdfunding and the impact of government policies on SME financing. Other studies have explored the determinants of SME performance and the role of innovation and technology in equity financing.

Bibliometric analysis has also revealed the key themes and concepts that have emerged in this field, including capital structure, financial performance, and market evaluation. These themes are closely related to the challenges that SMEs face in securing financing and achieving sustainable growth and thus represent important areas for future research. The bibliometric analysis provides a helpful tool for understanding the evolution and trends in equity financing and SME research. By identifying the key themes, authors, and publications, we can better understand SMEs' challenges and opportunities and the role of equity financing in supporting their growth and development.

6. Conclusion

In conclusion, this bibliometric analysis has provided valuable insights into current equity financing and SME research. The study revealed the growing interest in this area and the key themes, authors, and publications that have emerged in this field. The findings suggest a need for further research on the determinants of SME performance, the impact of emerging trends such as crowdfunding, and the role of government policies in supporting SME financing.

Despite its usefulness, bibliometric analysis also has its limitations. One limitation of this study is that it relied on Scopus as the sole data source, which may have excluded relevant publications from other databases. Additionally, the screening criteria may have excluded some relevant publications, and the results may be influenced by factors such as publication bias and citation practices.

Future research could address these limitations using multiple data sources and more inclusive screening criteria. Further studies could also explore emerging trends, such as using blockchain technology in equity financing and the impact of global economic conditions on SME financing. Additionally, there is a need for more comparative studies across countries and regions to understand better the similarities and differences in SME financing practices and policies. Overall, continued research in this area can help support the growth and development of SMEs and enhance our understanding of the role of equity financing in promoting sustainable economic growth.

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