

RESEARCH ARTICLE

Navigating the new normal: financial constraints in startups - A bibliometric analysis and roadmap for future research

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ABSTRACT

Purpose – The purpose of this study is to present a comprehensive summary of the current state of research and to critically analyse the accomplishments that have been made in the field of financing constraints. Hence, the objective of this study is to analyse the research patterns in this domain by consolidating the knowledge framework.

Design/methodology/approach – A bibliographical study was conducted on 190 Scopus-indexed articles filtered from 1081 articles to analyse the literature. This dataset was generated through a systematic search executed on the Scopus database, encompassing the time frame from 2000 to 2023.

Findings – By employing the bibliographic coupling methodology, a total of eleven distinct research clusters were found. The author performed a comprehensive analysis of these clusters and gleaned potential research ideas from them. Our work strengthens the current empirical data. The study's findings indicate that enterprises need to overcome credit constraints in order to improve their performance. Afterwards, we constructed a comprehensive framework to serve as the foundation for suggesting significant areas for future research.

Research limitations/implications – The present study has certain limitations. The methodology operates under the assumption that citations serve as the sole indicator of article quality. Consequently, it is possible that the study has overlooked publications of exceptional quality that have not yet garnered any citations.

Originality/value – For this investigation, the author relied on the reliable information provided by the Scopus database. Bibliographic coupling methods was employed to examine the dynamic landscape of research encompassing this nascent knowledge domain.

Keywords: Startups, Financing constraints, SMEs, Access to finance, Entrepreneurial finance.

1. Introduction

Economic development and expansion encompass an enduring process that entails the transformation of human resources, physical capital, natural resources, and technology ^[1]. Startups have emerged as a significant catalyst for sustained, quick, and robust economic development. Furthermore, startups play a crucial role in facilitating the advancement of an economy by attracting and employing highly skilled labour and fostering market growth and wealth ^{[2], [3]}. The success of startups is highly dependent on their access to

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financial resources inside the financial ecosystem. The role of finance is essential in enabling and promoting entrepreneurial development ^[4]. The issue of obtaining financial resources has been widely recognized as a common challenge encountered by startups, frequently seen as a significant impediment to their growth ^{[5], [6]} and often suffering from financing constraints ^[7]. It is important to analyze the elements that contribute to the financial constraints faced by startups and to comprehend the current situation. The prosperity of a company is intricately linked to the availability and accessibility of financial resources, which is a fundamental aspect of the business environment in which companies function ^{[8], [9]}. The digital transformation of a firm is influenced by the external financial environment in order to align with the rapid advancements in technology ^[10].

The issue of limited financial resources for new ventures has been a topic of significant interest for researchers, institutions, and organizations around the world ^[11]. The importance of external finance availability and accessibility ^{[12], [13], [14]} and the efficient utilization of internal finance through bootstrapping ^{[15], [16]} are significant concerns for policymakers worldwide in relation to small businesses. In light of this, there is a need to explore the changes in the literature on entrepreneurial finance. The academic literature on entrepreneurial finance and management has extensively examined the various ways in which financing constraints affect small and medium-sized firms ^[17]. Number of studies highlights that financial literacy reduces financial constraints, enhances business performance, and has the potential to yield advantages in terms of identifying opportunities, managing corporate risk, and fostering entrepreneurship ^[18]. In this study, the author endeavoured to address the issues pertaining to startups, as the realm of entrepreneurial finance has undergone significant changes in the past decade. When examining financial constraints, it is possible to define them as the inability of an entity to obtain the necessary cash, typically due to a scarcity of external financing, to sustain its desired path of growth ^{[12], [19]}. Consequently, scholars have endeavoured to devise approaches that consistently enable the identification and quantification of these restrictions ^[11]. Even multiple well-established theories can be used to emphasize the significance and pertinence of the topic. For example, startups give priority to using internal funds and low-cost debt instead of equity financing due to the high expenses and probable reduction of ownership associated with equity financing (Pecking order theory for financing choices). Having access to financial resources improves a startup's capacity to invest in crucial areas of growth, utilizing its distinct resources and competencies (Resource-based view for growth).

Restrictions on credit have severe consequences for the development of income, the disparity in income distribution, and the ability of firms to meet their financial obligations globally ^[20]. However, SMEs capacity to meet local demand, participate in exports, and ultimately make a substantial impact to the global economy would be severely hampered if they were unable to secure adequate capital ^[21]. This endeavour aims to emphasize the fragmented nature of research in this field. The establishment of finance constraints as a topic of research and practice provides the context for the bibliometric review of research that follows. Documenting and analysing trends in research conducted over the past 23 years on finance shortfalls, issues, limits, lacuna, and challenges was the purpose of this review. In this vein, the current study responds to the following research questions: What are the collaborative networks within the realm of financial constraints as a study area pertaining to small businesses? What are the emerging trends in the literature on financial constraints affecting small businesses? What is the current scope and future potential for research in the area of financial constraints impacting small businesses?

The author conducted a series of papers that explored the diverse financial obstacles encountered by small enterprises and the inventive strategies implemented to address them. The bibliographic data obtained from Scopus were subjected to analysis utilizing various software applications, including MS Excel, VOSviewer, Harzing PoP, and Biblioshiny. Bibliometric methods were employed to document and examine the dynamic landscape of research encompassing this nascent knowledge domain ^[22]. The findings provide

empirical support for understanding the scope and determinants of financial access while also offering a critical examination of the nascent domain of study and application in this area. These real-time data sources can be used by policymakers to help guide their strategic policy actions, which will benefit the enterprises most impacted by the financial problems.

To analyze the development in the literature, through bibliographical analysis of 190 Scopus-indexed documents screened out of 1081 Scopus-indexed documents published in 134 academic outlets authored by 419 scholars. This study makes significant contributions to both the existing body of literature and practical applications. Firstly, it emphasizes the necessity of enhancing access to financial resources and mitigating limitations in obtaining funding. Furthermore, to conduct a more comprehensive investigation in this field, our work has utilized bibliographic coupling analysis to establish 11 distinct clusters. Furthermore, this study identifies research gaps and proposes future research topics to address the issues found in the 11 clusters defined previously. Moreover, it has also put out a conceptual framework that can be tested by scholars in the future. This framework has the potential to expand knowledge and information in the field of entrepreneurship literature. Additionally, we employ several theories in practice to explain how the availability of financial resources affects the financial and non-financial performance of the business.

The rest of the review is structured as follows: First, a concise overview of the current state of the field is presented in Section 2. Furthermore, the elucidation of the methodology employed is provided in Section 3. Next, the review presents the results collected, specifically the cluster analysis conducted using bibliographic coupling and the systematic literature review conducted in Section 4.1. The former method emphasises identifying groups of articles that are closely connected based on bibliographic coupling, while the latter method examines the research gaps identified within each of the 11 clusters formed through bibliographic coupling. Additionally, the latter method explores potential future research directions for each cluster (Section 4.2). Ultimately, conclusion is summarised in Section 5.

2. Current State of the Art: The Existing Theoretical Foundations

Many academic disciplines (such as management, business, economics, and science) as well as various financial systems across countries have produced research on financial restrictions. Finance is crucial for startups ^[23]. Limited access to funding is a major issue that significantly affects aspiring entrepreneurs globally. Considering the significant impact that entrepreneurship is thought to have on economic growth, it is crucial for policymakers around the world to address the issue of limited access to funding for aspiring entrepreneurs ^{[21], [24], [25]}. The entrepreneurial finance landscape has undergone significant changes in recent years. A multitude of emerging participants have joined the field, including crowdfunding platforms, angel networks, accelerators (and incubators), peer-to-peer lending platforms, supply chain finance ^[26], corporate venture capital firms, investment funds focused on intellectual property, debt funding backed by intellectual property, social venture funds, mini-bonds, government venture capital programs, university-based funds, and venture debt lenders ^[7].

These new players have not only contributed a variety of investment goals but also provided innovative investment tactics, methods for determining value, and business models for financing entrepreneurship. Consider the social return on investment (SROI) statistic, which aims to evaluate the impact of social enterprises. These novice investors have a role that goes beyond just providing financial resources. In addition, they provide value-added services, including management and technology assistance, as well as guidance and network connectivity ^[17]. It is not clear from this analysis, that the new players and their financing tools are actually reducing the funding gap in the early phases of financing innovative projects, or if they are just taking the place of or replacing already-existing later-stage financing tools.

Fraser ^[26] did a study on the elements that impact the financial life cycle of initiatives, with a specific focus on both the demand and supply side. This study emphasized the significance of cognitive biases as a factor on the demand side that influences decision-making regarding the framing and evaluation of available options. These biases may also undergo changes over time as entrepreneurs gain experience. The lack of transparency in a firm's information discourages regular investors and can change over time, impacting the way the firm obtains financing ^[8]. Notwithstanding this comprehensive review, the author indicated that further research is necessary to determine the effects of financing constraints on firm growth.

Even in the early stages of emerging entrepreneurial startups, the primary challenge is securing seed funding, which is the most significant barrier to obtaining financial support ^[27]. Unlike the Great Financial Crisis (GFC) of 2007-09, the Covid-19 turmoil can be characterized as a genuine shock to the economy^[28]. Empirical research conducted during the COVID-19 pandemic indicates that approximately 50% of small businesses have temporarily halted their operations since the implementation of the lockdown. Furthermore, around 60% of small and medium-sized enterprises (SMEs) are facing the possibility of depleting their financial reserves ^[29], ^[30]. In developing economies, interpersonal connections and networks are frequently regarded as a viable alternative to established institutions ^[31], ^[32], ^[33]. According to a number of studies, forming relationships with bankers, government officials, acquaintances, and entrepreneurs may significantly improve the ability of lending institutions and corporate borrowers to communicate with one another ^[34].

The topic of our research is intricately linked to several theories, such as the pecking order theory, resource-based view theory, dynamic capacities theory, agency theory, trade-off theory, lifecycle theory, signalling theory, and upper echelon theory. Pecking order theory is a framework that prioritises sources of funding based on their convenience and cost ^[35]. It recommends ventures to initially depend on internal funding, then turn to bank loans, and only consider equity as a last option. Startup entrepreneurs utilise a similar strategy because of the excessively high costs and difficulties associated with obtaining external finance, especially in terms of equity ^[36], ^[37].

The resource-based view asserts that a company's resources and capabilities are crucial for achieving and sustaining a competitive advantage ^[23]. Funds are considered as a crucial resource for growth and success of startups ^[38]. The dynamic capabilities theory also helps support the idea that startups often need to quickly adapt to changes in the market and competitive landscape ^[39]. Financial limitations can restrict their capacity to cultivate dynamic qualities, which can have an impact on their growth and survival. The conventional agency theory addresses disputes that arise between principals (owners) and agents (investor) as a result of divergent objectives and information asymmetry ^[40]. Within the realm of startups, agency issues may emerge between founders and investors, which could result in financial limitations if investors are cautious about divergent interests or inadequate leadership ^[41].

Moreover, according to the lifecycle theory, companies have various phases of growth (such as inception, growth, maturity, and decline), each with unique requirements for funding and obstacles to overcome ^[42]. Startups are at the early stage of their lifecycle and commonly have significant limitations in obtaining capital. Gaining insight into their current stage of development can aid in formulating suitable financial tactics. Taking into consideration signalling theory posits that enterprises communicate their quality and potential to external investors by engaging in acts such as acquiring prestigious certifications or forming strategic relationships ^[43].

The upper echelon theory states that a managerial knowledge of the owner have an impact on the strategy and performance of the organisation ^[44], ^[45], ^[46]. This is because the financially literate owner of the startup enhances financial activities, which in turn leads to a decrease in financing constraints ^[47]. At the last

financial literacy, as per the trade-off theory, includes understanding the advantages and disadvantages of indebtedness. Acquiring this knowledge enables organisations to establish a well-proportioned financial framework, so enhancing lenders' confidence and facilitating the resolution of financial limitations [48], [49].

We draw in these theories to emphasize the significance of financial resources, strategic management, and effective signalling in overcoming limitations and attaining sustainable growth. Companies with restricted credit availability were more likely to employ alternative funding mechanisms, such as trade credit, delayed payments to suppliers or employees, government grants, and other informal sources [50]. During the COVID-19 epidemic, these companies were more prone to facing a higher level of credit risk compared to those that were not restricted [50]. The majority of research suggest positive effects of grants on firm-survival, employment, physical assets, and sales. However, the impact on labour productivity and total factor productivity (TFP) is more varied and inconclusive [51]. This study emphasized the impact of public funds in mitigating the financial limitations faced by small businesses.

The explosion of research on financial limitations in recent years, together with the efforts of many scholars to bring the idea together, has resulted in the study of financial constraints from a variety of angles. Given the two renowned studies that devised their own metrics or indicators, notably the KZ index [52] and GMM estimation [53], in order to identify the traits of financially constrained companies. The GMM index revealed that enterprises classified as "constrained" by this index display traits commonly linked to being affected by limitations in accessing external financing. Unlike the KZ index, it does not segregate companies with attributes linked to financial limitations. Based on the GMM index, firms exhibit characteristics such as being modest in size, having limited investment, experiencing minimal analyst coverage, and lacking bond ratings. In contrast, firms classified as KZ index firms are characterized by their big size, tendency to over-invest, heavy analyst coverage, and significantly higher occurrence of bond ratings compared to the whole population of enterprises. However, Altman [54], [55] have recently presented a model for predicting default in small and medium-sized enterprises (SMEs) known as Omega Score. They utilized variables relating to management and employees to determine whether a SME is likely to default. For instance, when a company's bank account is frozen for a period of 30 or 60 days, this act of "blocking bank accounts" occurs before a legal bankruptcy or most instances of default.

The figure 1 illustrates that the core financing constraints arise from an intricate web of internal factors associated with the firm and its owner, as well as external factors related to economic, social, and governance aspects. Financial literacy is an intangible resource that allows a company to obtain [46] and handle other unique resources, leading to increased competitive ability and, consequently, higher profits [47]. Therefore we propose to test the financial literacy and Networking as a mediator that may scientifically prove to reduce the financing constraints for the startup owners.

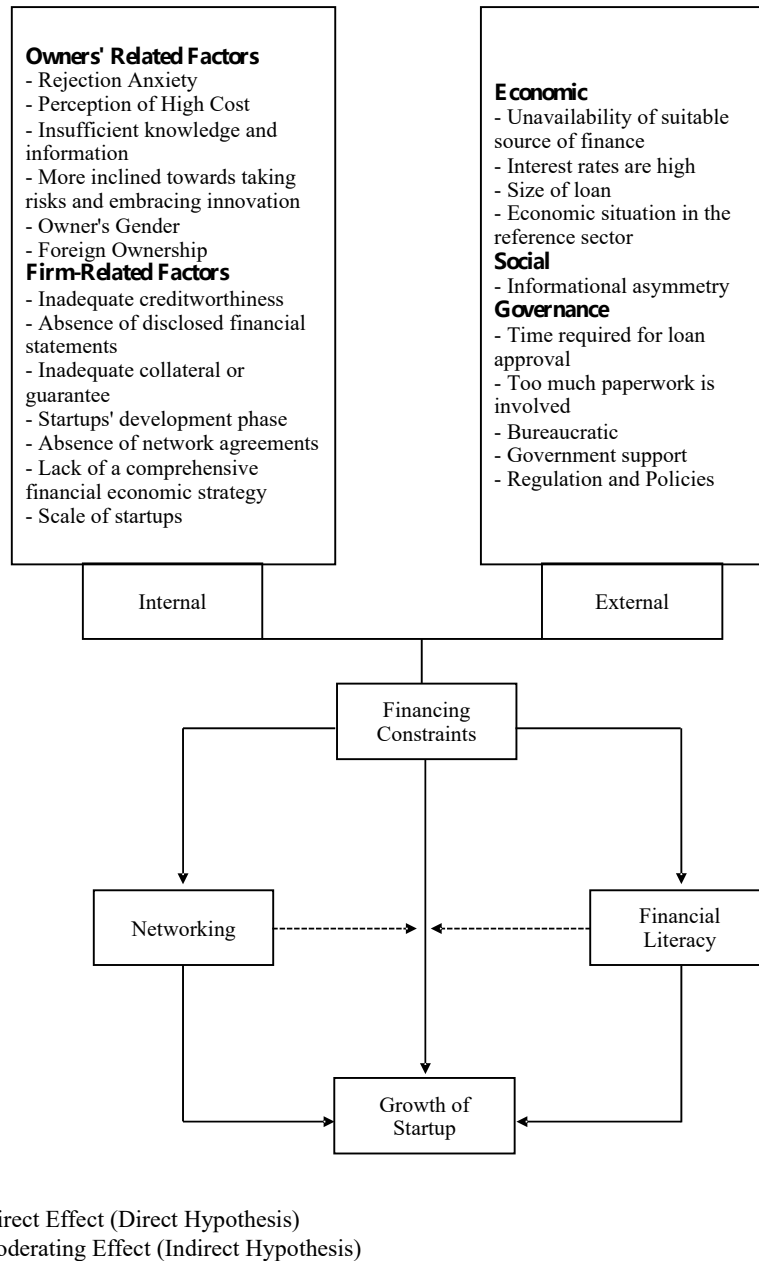


Figure 1. Proposed model to understand the mediated-moderated roles of financial literacy and Networking (Based on In-depth literature review)

Source: Authors Own

These financing constraints may differ depending on whether traditional or new emerging sources of finance are utilized. Corporations frequently encounter precarious financial situations. Nevertheless, firms can effectively navigate these hurdles by using meticulous financial management and optimization measures. The objective is not merely to endure these challenging circumstances, but to emerge with increased strength, enhanced adaptability, and preparedness to seize chances when economic conditions ameliorate. These tactics guarantee that even in times of financial constraints, your organization may still achieve success [56].

3. Research Methodology

Bibliometric analysis involves the retrieval of documents from a single database and the use of statistical tools to examine and analyze published academic studies^[57]. Bibliometrics encompasses a range of descriptive statistical measures applied to citation data, as well as network analysis techniques that examine the relationships among authors, journals, organizations, countries, and keywords through the analysis of citations and frequency^[58]. This tool makes it easier to identify research clusters, provides helpful insights into the predominant research interests in a certain topic, and reveals developing trends in that field. For this study, the author used Scopus since it offers many advantages over Web of Science, PubMed, and Google Scholar^[59]. The present study primarily examined documents that were published in peer-reviewed journals. However, the analysis did not include gray literature, editorials, short surveys, data papers, conference reviews, or book chapters^[60].

For creating the research query, we used: (“Finance” OR “Financ* Access*” OR “Access to Finance” OR “Access to Bank Loans” OR “access to fund” OR “access to Credit” OR “Access to external Finance”) OR (“Information Asymmetry” OR “lending Infrastructure” OR “funding constraint” OR “funding challenge” OR “funding Issue” OR “funding lacuna” OR “funding gap” OR “creditworthiness” OR “funding obstacle” OR “financial constraint” OR “financing constraint” OR “financing Challenge” OR “financing issue” OR “financial issue” OR “financing Lacuna” OR “financing gap” OR “financing obstacle” OR “Demand gap” OR “supply gap”) AND (“small business” OR “new venture” OR startup OR “new business” OR “start-up” OR “Entrepreneurial finance” OR SME OR “SME Finance” OR “Start-up Financing” OR “Small and Medium Enterprises” OR “Small and Medium-sized Enterprises” OR “Small Business Finance” OR “Small to medium sized enterprises” OR MSME OR “small enterprises”). This query is formulated with a focus on three domains: access to money, financing challenges, and startups.

We ran the above query in Scopus with the “TITLE-ABS-KEY” operator. The scope and coverage of the above query is as follows:

Database: Scopus

Search Field: Article Title & Keywords

Time Frame: 2000- 2023

Language: English

Source Type: Journal

Document Type: Article & Conference Paper

Subject Area: Business Management and Accounting; Economics, Econometrics and Finance; Social Sciences

Publication Stage: Final

The results were subsequently restricted to "articles" and "conference papers". The publications published in Scopus, which is the main scientific database, were obtained on July 12, 2023. This list contains a total of 1081 published articles. An extensive examination of the abstracts of 1081 articles was conducted to discover their structural characteristics, objectives, themes, and motives that align with the author's intended purpose. Subsequently, investigations beyond the scope of this work were eliminated. During this stage, we thoroughly examine all the abstracts, and if no abstract is provided, we analyse the introductions instead. Three elements were taken into consideration when determining the cleaning procedure' exclusion criteria: (1) The subject of analysis, (2) the standard interpretation, and (3) the objective of the present

investigation [61]. Documents that did not conform to the theme and strayed from the intended emphasis were also omitted. Ultimately, a grand total of 190 articles were acquired from the database, after excluding 891 items.

4. Research Clusters Through Bibliographic Coupling & Future Directions

Bibliographic coupling is employed to build connections among documents, sources, authors, organizations, and countries by means of referencing [58], [60]. One advantageous characteristic of this approach is its immediate applicability, eliminating the requirement to amass citations [58]. Bibliographic coupling is a method used to assess the degree of similarity between two papers by examining the extent to which they have common references [57]. The process of integrating previous research findings and bibliometric data is a crucial aspect of the progressive development of scientific knowledge [62].

4.1 Bibliographic Coupling of Financing Constraint Research Outcomes

Bibliographic coupling analysis was conducted with the full counting method by using documents as the unit of analysis. A threshold limit of 5 was set as the minimum number of citations per document. Out of 190 documents, 84 met the threshold limit. The results revealed 84 documents, 11 clusters, 476 links, and 722 total links (Figure 2). These eleven thematic clusters were studied and produced through the application of bibliographic coupling in VOSviewer (Table 1). The clusters can be identified as follows:

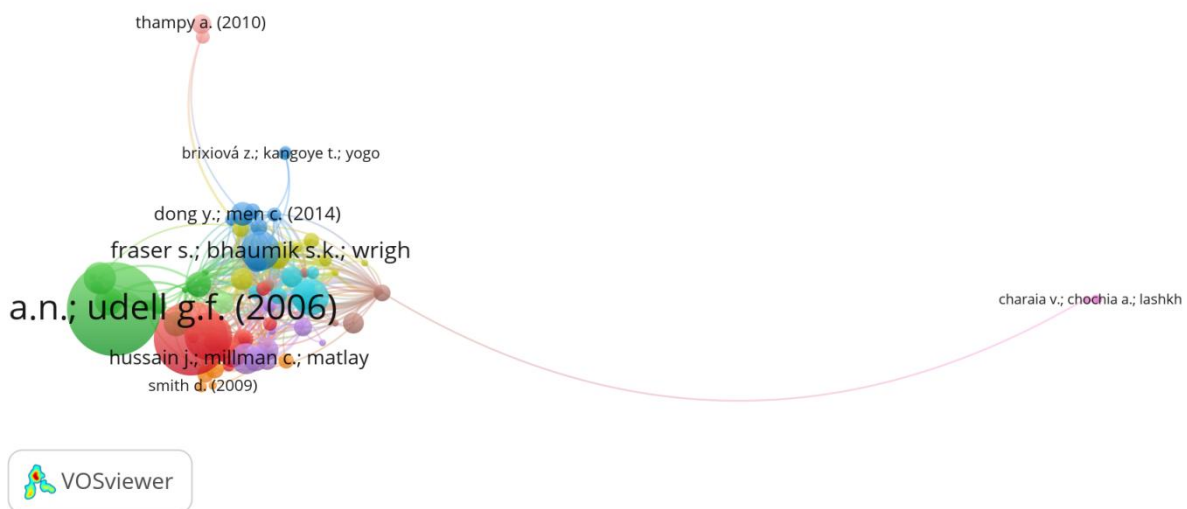


Figure 2. Bibliographic coupling network of documents

Source: VOSviewer

Table 1. Thematic clusters of Financing Constraints Research Outcomes

Theme	Author(s)	Title	TC*
Cluster 1- Navigating Access to Finance and Capital Structure	[40]	“The financing of business start-ups”	564
	[63]	“Capital structure and financing of SMEs: Australian Evidence”	232
	[64]	“The pecking order hypothesis: Does it apply to start-up firms?”	71
	[65]	“Gender and the SME Finance Gap”	52
	[66]	“Small business financing initiatives in Ghana”	43
	[67]	“The debt-equity financing decisions of US startup firms”	34
	[68]	“Microenterprise financing preferences: Testing POH within the context of Ghana's rural financial market”	34
	[69]	“Financing small and medium enterprises (SME) in Ghana”	32
	[70]	“Access to finance and financial problems of SME: Evidence from Egypt”	20
	[71]	“Demand for debt and equity before and after the financial crisis”	20
	[72]	“Intersectoral differences in the SME financing gap: Evidence from selected sectors in Ghana”	19
	[73]	“Financing preferences of micro and small enterprises owner in Tigray: Does POH hold?”	18
	[74]	“The effect of firm characteristics in accessing credit for SMEs”	15
	[75]	“Capital structure and investment financing of small and medium - sized enterprises in Vietnam”	13
	[76]	“Factors Influencing intentions of Egyptian MSME owners in taking commercial bank loans”	9
Cluster 2- Lending technologies, Networking, and Social Capital	[13]	“A more complete conceptual framework for SME finance”	894
	[34]	“The impact of networking on bank financing: The case of small and medium-sized enterprises in Vietnam”	110
	[77]	“Determinants of start-up firm external financing worldwide”	84
	[78]	“An empirical evidence of small business financing in China”	71
	[79]	“Do social capital building strategies influence the financing behavior of Chinese private small and medium-sized enterprises?”	65
	[80]	“SME Finance in Africa”	36
	[81]	“Financing high-tech SMEs in China: A three-stage model of business development”	33
	[82]	“Four proposals for improved financing of SME development in ASEAN”	18
	[83]	“Small firms' credit access in the euro area: Does. Gender matter?”	17
	[84]	“Access to financing in a small island economy: Evidence from Mauritius”	15
	[85]	“Determinants of access to bank finance for small and medium-sized enterprises: the case of Sri Lanka”	7
	[86]	“Financing needs of microenterprises along their evolution”	7
[87]	“Determinants of SMEs financing patterns in India- a rotated factor analysis approach”	7	

	[88]	“The entrepreneur's idea and outside finance: Theory and evidence about entrepreneurial roles”	6
Cluster 3- Factors, Policies, and Innovations	[26]	“what do we know about entrepreneurial finance and its relationship with growth?”	160
	[89]	“SME financing in emerging markets: Firm characteristics, BANKING STRUCTURE AND INSTITUTIONS”	59
	[90]	“UK credit and discouragement during the GFC”	47
	[91]	“Discouraged finance seekers: An analysis of Australian small and medium-sized enterprises”	31
	[92]	“The impact of government financial assistance on the performance and financing of Australian SMEs”	26
	[93]	“Factors affecting SME access to bank financing: An interview study”	23
	[94]	“Access to credit and informality among micro and small enterprises in Ethiopia”	19
	[95]	“Access to finance among small and medium-sized enterprises and job creation in Africa”	17
	[96]	“The casual effect of access to finance on productivity of small and medium enterprises in Vietnam”	15
	[97]	“Digital finance and investment of micro and small enterprises: Evidence from China”	9
Cluster 4- Challenges and Access to Finance Across Diverse Regions and Industries	[98]	“Demystifying small and medium enterprises” (SMEs) performance in emerging and developing economies”	68
	[99]	“Financing patterns of European SMEs- an empirical taxonomy”	54
	[100]	“Financing patterns of SMEs in India during 2006 to 2013- an empirical analysis”	32
	[101]	“Entrepreneurial orientation and small and medium-sized enterprises' performance ; does 'access to finance' moderates the relation in emerging economies?”	25
	[102]	“Entrepreneurial finance and new venture success- the moderating role of government support”	17
	[103]	“Small and medium enterprise financing in transition economies”	12
	[104]	“Tackling small and medium-sized enterprise’s (SMEs) financing in China”	7
	[105]	“Modelling the process of financing small organisations”	7
	[106]	“Entrepreneurial finance journeys: Embeddedness and the finance escalator”	6
	[107]	“Formal and informal SME financing in the restaurant industry: the impact of macro environment”	4
Cluster 5- Small Businesses and Access to formal & informal finance	[108]	“SME financing in the UK and in China: a comparative perspective”	100
	[109]	“Financing preferences of ethnic minority owner/managers in the UK”	62
	[110]	“Barriers to small business growth in Canada”	48
	[111]	“Start-up size: the role of external financing”	39
	[112]	“Government support and SME performance: the moderating effects of diagnostic and support services”	38
	[113]	“Determinants of SME growth: the influence of financing patterns- An Empirical study based on Swedish data”	15

	[114]	“SME firm characteristics impact on the choice of sources of financing in south-west, Nigeria”	13
	[115]	“Can financing constraints explain the evolution of the firm size distribution?”	6
	[116]	“The impact of internal finance on growth empirical evidence from Swedish firm level data”	6
Cluster 6- Financing Constraints and Decision-Making in Diverse Contexts	[27]	“Financing entrepreneurship in times of crisis: Exploring the impact of covid-19 on the market for entrepreneurial finance in the UK”	134
	[117]	“Innovation and SME finance: Evidence from developing countries”	75
	[118]	“Financing constraints and SME innovation during economic crises”	45
	[119]	“Formal and informal financing decisions of small businesses”	31
	[120]	“The financing options for new small and medium enterprises in south Africa”	19
	[121]	“Barrier to technological innovations of SMEs: how to solve them?”	19
	[122]	“Firm-level determinants of the financing decisions of small and medium enterprises: Evidence from Argentina”	16
	[123]	“The role of trust and social commitment in start-up financing”	7
	[124]	“Accessibility to credit of small medium enterprises in Vietnam”	5
Cluster 7- Financial Challenges and Strategies in Startups	[125]	“Working capital financing preferences: the case of Mauritian manufacturing SME”	36
	[5]	“Cases of start-up financing: an analysis of new venture capitalization structures and patterns”	33
	[126]	“A comparative study of the financial problems faced by micro, small and medium enterprises in the manufacturing sector of Fiji and Tonga”	25
	[127]	“Financial bootstrapping and social capital: how technology-based start-ups fund innovation”	13
	[128]	“Start-ups and external equity: the role of entrepreneurial experience”	8
	[6]	“Examining the determinants and consequences of financial constraints faced by micro, small and medium enterprises' owner”	5
Cluster 8- Dynamics of Creditworthiness and Key Determinants of Access to Finance	[129]	“Factor influencing access to finance by SMEs in Mozambique: Case of SMSs in Maputo central business district”	48
	[130]	“A systematic literature review on SME financing: Trends and Future directions”	33
	[131]	“Debt financing decisions of SMEs in emerging markets: Empirical evidence from Malaysia”	16
	[132]	“Creditworthiness and access to finance: a study of SMEs in the Malaysian manufacturing industry”	12
	[133]	“An empirical study of optimal access to external finance by SME start-ups”	5
Cluster 9- Fintech Financing Frontiers	[134]	“Promoting fintech financing for SME in S. Caucasian and Baltic states, the covid-19 global pandemic”	10
	[135]	“The role of financial technology and entrepreneurial finance practices in funding small and medium- sized enterprises”	9
	[136]	“A new regime of SME finance in emerging Asia: enhancing access to growth capital and policy implications”	7

Cluster 10- Addressing challenges and exploring alternative avenues in India	[137]	“Financing of SME firms in India: Interview with Ranjana Kumar, Former CMD, Indian Bank, Vigilance Commissioner, Central Vigilance Commission”	39
	[138]	“Scope for alternative avenues to promote financial access to MSMEs in developing nation evidence from India”	23
Cluster 11- Capital Structure of SMEs	[139]	“Capital structure of small and medium enterprises: the Italian case”	49

(TC* stands for total citations received)

Source: Authors Own

Cluster 1- Navigating Access to Finance and Capital Structure

This cluster is the largest among all 11 clusters, comprising a total of 15 articles pertaining to navigating access to finance and capital structure. The three articles that received the most citations within this cluster are^[40], ^[63] and^[64], with citation counts of 564, 232, and 71, respectively. This cluster is primarily concerned with the various and intricate facets of financial decision-making in small firms. It draws attention to the connections between financing options, capital structure, and financial resource accessibility as well as the several aspects that affect these crucial choices.

The studies within this cluster demonstrate that various factors, such as start-up age ^[71], size ^[40], ^[63], ^[67], ^[68], ^[71], asset structure ^[40], ^[63], ^[67], ^[71], profitability ^[63], ownership type ^[40], ^[68], ^[70], ^[71], ^[73], risk ^[63], acquisition type ^[40], selling product ^[67], and growth orientation ^[40], ^[67], ^[140], significantly influence the type and magnitude of finance use.

The individual- and firm-specific factors affecting access to financing, particularly from banks, are also studied. Gender, age, knowledge, and education of the owner and the asset size, sales volume and stability, export rate, and legal form of the firm were the factors studied ^[74], ^[76]. However, studies employing diverse geographic contexts, such as Australia, Ghana, Egypt, Scotland, and Vietnam, have provided a global perspective on the challenges faced by these businesses. The Pecking Order Hypothesis (POH) often guides the analysis, shedding light on the capital finance preferences of startup firms. The findings consistently reveal that internal funds are preferred over external equity, challenging traditional debt-centric financing theories. Access to finance emerges as a central concern, with studies exploring both supply- and demand-side issues. Policy initiatives to alleviate financing constraints are discussed, particularly in regions such as Ghana.

Cluster 2- Lending technologies, networking, and social capital

This cluster is the second largest one. It comprises of those 14 articles that related to the theme use of networking, social capital and lending technologies for the businesses. Since they have been obtained from the bibliographic coupling analysis, that means these would be such articles that have used common resources or cited papers in this field. The top three articles that have received the highest citations are ^[13], ^[34], and ^[77], with citation counts of 894, 110, and 84, respectively. Mainly the papers in this cluster focused on the factors that affect the process of arranging funds, building networks, and effective use of social capital ^[83]. Prijadi ^[86] highlighted the situation in Indonesia and the scenario of usage of external funds for the small businesses. In particular, the usage of bank loans and social networks is also examined by Singh & Janor ^[87]. In most of the studies in this cluster, the effect of innovative business ideas in relation to obtaining external finance is examined. It can be concluded that external finance is crucial for startups growth, particularly in high-tech industries ^[81].

Cluster 3 – External Factors, Policies, and Innovations

In total 10 studies fall under this cluster, after satisfying the criteria of the bibliographic coupling analysis in VOSviewer. Overall, these are such papers that are dealing with the concept of external factors including government policies, finance decisions, innovation choices and other economic scenarios affecting small ventures. The top three publications that have received highest citations are [26], [89], and [90], with citation counts of 160, 59, and 47, respectively. In this cluster, the author [26] discussed mainly factors affecting the growth of the small business, Xiang^[92] analysed the performance of the small ventures, whereas Xiang^[91] highlighted the behaviour related aspects. Taking into consideration these studies, they emphasized how important funds are for SMEs and various challenges faced by the owners to obtain the same^{[89], [91]}. It is also emphasized that for these budding startups and growth-oriented small businesses with promising investment opportunities, it is important to have ease of obtaining loan for promoting economic development^{[90], [93]}. The effect of government policies and financial assistance programmes on innovation practices of small business performance are also closely examined by Xiang & Worthington^[92]. Overall, they provide information about how financial barriers can affect the development of innovative ideas, operation of the ventures, and overall advancement of the SMEs in different economies context.

Cluster 4- Challenges and Access to Finance Across Diverse Regions and Industries

The paper in this cluster is dedicated to challenges in accessing external finance in various sectors and regions. Since the articles fall under this cluster are from different geographical region. There are ten articles in this cluster and the top three publications that received highest citations are [98], [99], and [100], with citation counts of 68, 54, and 32, respectively. In this cluster, all those papers that have produced work related to the examination of financial difficulties faced by SMEs and emerging business particularly related to variety of economies is included. In collaboration, they have explored different aspects related to patterns of obtaining finance^[100], performance evaluation indication and criteria^[98], and all of these with different economic context including emerging and developing markets, European nations, and transition economies^{[101], [103]}. Morozko^[105] studied the financial modelling that can improvise the decision making for emerging entrepreneurs and will provide key elements that can further impact their financial well-being. Research in this cluster examines the cognitive aspects related to entrepreneurial mindset that further can affect the financial and non-financial decision^[101]. For example, the financial knowledge possess by the entrepreneurs can help them in obtaining finance with ease.

Cluster 5- Small Businesses and Access to formal & informal finance

The usage of formal and informal sources of finance can have various repercussions and open different avenues for expansion of business. This cluster comprises of 9 articles that revolve around the options of formal and informal sources of finance that can be utilized at various stages of business cycle as we referred in the theory of life cycle. The top three documents in this cluster that have received the highest citation are [108], [109], and [110], with citation counts of 100, 62, and 48, respectively. The studies in this cluster focused on highlighting the obstacles obtained by the owners of the small ventures in arranging the funds for the growth of their business. They have explored the sources that are preferred by the owners at the various stages of the business life cycle^[108]. Even the financing options preferred and explored by the special group of businesses like by ethnic minorities in comparison to the traditional sources of finance is being explored by Hissain & Matlay^[109]. In addition to this, other studies focused on evaluating the effect of the choice of finance on the dynamics of business.

Cluster 6- Financing Constraints and Decision-Making in Diverse Contexts

This cluster also includes 9 studies when bibliographic coupling was done. The reason on the basis of which they have come under one umbrella is decision-making choices related to the financing when struggling with financial constraints. The top three articles that been cited highest number of times are [27], [117], and [118], with citation counts of 134, 75, and 45, respectively. The study by Brown et al., 2020 received highest number of citations even though it is the latest one as compared to other studies. The reason can be relevance of the study and appropriate analysis done by this study. In this cluster, the researchers altogether investigate the impact of multiple areas related to finance for emerging small businesses. For example, related to economic crises, hurdles to technical innovation, and the influence of social trust and government support. The authors [117] explored the relationship between the funding and innovation for SMEs. This study provides valuable insights about how different forms of finance [119], broadly formal and informal source of finance shape the innovation activities of the businesses [124]. Not only these two variables are being studied, but the impact of human, organisational, and institutional factors also being explored on the financing choices [119], [120]. However, the studies in this cluster covered a very broad perspective by covering different economies for example, Argentina, South Africa, United Kingdom and Vietnam.

Cluster 7- Financial Challenges and Strategies in Startups

This cluster is very different as compared to others since it offers strategies can be applied by the entrepreneurs to mitigate the various financial challenges. This cluster includes six articles and the top three documents that have received the maximum citations are [5], [125], and [126], with citation counts of 36, 33, and 25, respectively. The papers in this cluster examined the funding challenges and tactics to handle them in reference to emerging businesses. The informal sources of finance and short-term debt is being preferred by the SMEs over other form finance wherein owners lose their control over the organisation [125]. The study [5] highlights various new emerging sources of finance for new ventures that can be preferred over traditional sources and rigid assumptions [5]. Moreover, in a research significance of financial bootstrapping and social capital is also being explored with empirical testing in reference to technology driven startups [127]. In addition to financial bootstrapping which is one of the tactics that can help new ventures to survive for long, financial literacy can also help in alleviating the financial constraints for emerging business units [6].

Cluster 8- Dynamics of Creditworthiness and Key Determinants of Access to Finance

This cluster offers the studies related to the creditworthiness of the ventures to procure external fund which altogether a very big constraint to obtain external finance for emerging startups. This cluster includes five studies and the first three that received highest citations are [129], [130], and [131], with citation counts of 48, 33, and 16, respectively.

These studies investigate the various aspects that influence the ability of the entrepreneurs to obtain finance. For example, characteristics of firm and owner, knowledge about funding options, composition of financial sector, requirements for collateral, the availability of support services and creditworthiness. A study conducted in Mozambique analysed the various elements that affect SMEs' ability to obtain financial resources. Another study examined a vast available literature from 1986 to 2020 with an objective to have a comprehensive understanding of the current state of research on financing for SMEs. The important contribution by author [130] for examination of intervention of government and financial institutions in improving access to finance cannot be neglected. Another study highlighted the impact of financial performance and credit history on their decision to obtain loan. It concluded that the presence of asymmetric information problem is disturbing the access to finance [131]. Another study conducted in Malaysia examined

the effect of creditworthiness by keeping it as mediator between the features of SMEs and their ability to obtain financing.

Cluster 9- Fintech Financing Frontiers

This ninth cluster consists of three articles related to recognizing the role of fintech in improving accessibility, and affordability of the finance with reference to those countries where traditional financial choices are insufficient. These are as follows: ^[134], ^[135], and^[136] with citation counts of 10, 9, and 7, respectively. The citations received by these paper is low with possibility of studies related to the recent advancement of fintech in this sector and another reason can be recent publication of these studies. Shinozaki ^[136] used a comprehensive approach to highlight the financial instability faced by SMEs across the worldwide while trying to access external finance. Charaia ^[134] highlight the crucial role of financial technology (fintech) in addressing the funding shortfall for small and medium-sized firms, especially in developing regions. Lasak ^[135] explores the changing nature of small and medium-sized enterprise (SME) funding, emphasising that conventional bank loans are no longer adequate for these businesses, particularly in emerging nations.

Cluster 10- Addressing challenges and exploring alternative avenues in India

Only two papers in this cluster discuss difficulties and explore alternate ways to boost financial access and SME development in India. The number of citations received within this cluster by the two documents are as follows: ^[137], and ^[138], with citation counts of 39 and 23, respectively. The primary focus of these texts pertains to financing issues pertaining to India. In the first paper ^[137], the focus is on the challenges SMEs face in accessing financing, including issues such as information asymmetry and the role of banks in developing the SME sector. In the second paper ^[138], the emphasis is on identifying opportunities and challenges in MSME financing, considering both traditional bank financing and alternative avenues. Furthermore, it emphasises the significance of government policies and activities in facilitating financing for micro, small, and medium enterprises (MSMEs). Both papers emphasise the importance of discovering creative ways to improve financial access for small and medium-sized enterprises (SMEs) in India. They acknowledge that this sector is vital for the country's economic growth.

Cluster 11- Capital Structure of SMEs

The cluster contains only one publication, authored by Rossi ^[139]. This paper has received a significant number of citations, with a count of 49, and has a high overall link strength of 31. The study analyses 764 nonfinancial Italian SMEs, recognising their heterogeneity but regarding it as a valuable initial stage for examination. This research applies different financing theories, including the pecking order theory (POT), trade-off theory, and fiscal theory, to explain SMEs' capital structure choices. The findings support the pecking order theory, indicating that SMEs tend to initially use internal resources and then turn to external capital sources, particularly bank debt. However, some limitations, such as the randomness of the sample and the need for a more extensive sample size, should be considered when interpreting the empirical findings.

4.2 Research Gaps and Future Research Direction

Table 2 presents the research gaps and future goals based on a bibliographic coupling analysis of clusters using VOSviewer.

Table 2. Research Gaps and Future Research Directions based on Thematic Clusters

Cluster	Research Gap	Future Research Directions
Cluster 1- Navigating Access to Finance and Capital Structure	<ul style="list-style-type: none"> · Research limited to behavioral factors influencing financing preferences. · Limited research on analysis of entrepreneurial traits and skills that affect financing choices. · Inadequate effort has been made to evaluate the efficacy of particular government initiatives and programmes designed to enhance access to financial resources for startup companies. · A research gap exists in exploring how the alternative methods of financing impact startups. 	<ul style="list-style-type: none"> · Research required on psychology and behavioral biases of entrepreneurs and how these impact their financing decisions. · Research opportunity to investigate specific entrepreneurial traits and skills that affect financing choices in more detail. · Examine the efficacy of particular government initiatives and laws targeted at facilitating startups' access to capital. · Study the effectiveness of crowdfunding, peer-to-peer lending, and other nontraditional financing sources
Cluster 2- Lending technologies, Networking, and Social Capital	<ul style="list-style-type: none"> · Much research has been done on evolving role of technology in financial services · Studies focused on gender differences in SME financing highlights the need to explore whether gender bias or structural differences in firms led by women contribute to disparities. · Limited study on the dynamics of networking in context to startups · Insufficient research on availability and accessibility of financing options for sustainable Startups. 	<ul style="list-style-type: none"> · Explore how digitalization, fintech, and online platforms are shaping SME financing opportunities and challenges · More in-depth research could provide insights into the root causes and potential remedies for gender-based financing disparities. · Examine the process by which entrepreneurs establish and utilise networks, the significance of trust, and the influence of networking on the growth of companies. · Investigate the availability and accessibility of financing options for sustainable Startups and how sustainability practices impact financing decisions.
Cluster 3- Factors, Policies, and Innovations	<ul style="list-style-type: none"> · There is a lack of extensive study on the qualitative perspectives of startup owners and managers regarding the impact of government aid on their long-term strategy, investments, and decision-making. · Limited research on different types of government assistance programs (e.g., grants, subsidies, loans) that have varying long-term impacts on Startups. 	<ul style="list-style-type: none"> · To obtain a more profound comprehension of how government aid influences the long-term strategies, investments, and decision-making of startup owners and managers, research is necessary to supplement quantitative data with qualitative insights. · Investigate the effectiveness and sustainability of government financial assistance programs for SMEs
Cluster 4- Challenges and Access to Finance Across Diverse Regions and Industries	<ul style="list-style-type: none"> · Lack of comparative analysis related to startups across various countries and industries. 	<ul style="list-style-type: none"> · Compare and contrast the impact of factors like entrepreneurial orientation, access to finance, government support, and macroeconomic environments on startups across various countries

		and industries.
Cluster 5- Small Businesses and Access to formal & informal finance	<ul style="list-style-type: none"> · Limited focus on the intersection of cultural factors and SME financing preferences · Inadequate research on investigating specific cultural barriers or facilitators that affect financing options and preferences. 	<ul style="list-style-type: none"> · Study the influence of the cultural, social, or ethnic dimensions on financing preferences · Explore how cultural backgrounds, norms, and values shape the financial behaviors and decisions of different ethnic groups within different startup sectors
Cluster 6- Financing Constraints and Decision-Making in Diverse Contexts	<ul style="list-style-type: none"> · Need for a more in-depth exploration of the long-term effects of crises, such as the COVID-19 pandemic, on Startup financing and innovation. · Limited research on understanding the unique financing needs of different types of Startups at various stages. 	<ul style="list-style-type: none"> · Investigate the recovery trajectories of Startups postcrisis, the sustainability of government support mechanisms, and the adaptations made by startups in response to prolonged challenges. · Analysis of financing requirements for Startups at various stages of development and in different industry sectors.
Cluster 7- Financial Challenges and Strategies in Startups	<ul style="list-style-type: none"> · Insufficient studies to understand the detailed tactics used by startups to navigate financial difficulties. · Limited studies used qualitative research methods, case studies, and surveys to explore the unique financial strategies adopted by small businesses. · Opportunity to investigate the role of financial education and awareness among entrepreneurs in these enterprises 	<ul style="list-style-type: none"> · Investigate strategies and mechanisms that startups employ when facing financial constraints and seeking financing. · Explore financial strategies adopted by small businesses by using qualitative research methods, case studies, and surveys. · Understanding how financial literacy influences their decision-making and ability to manage financial constraints
Cluster 8- Dynamics of Creditworthiness and Key Determinants of Access to Finance	<ul style="list-style-type: none"> · Studies touch upon various factors such as financial sector structure, awareness, collateral requirements, and creditworthiness, they often focus on economic and institutional aspects · Limited research to provide practical recommendations for improving Startups' access to finance 	<ul style="list-style-type: none"> · Investigate how cultural norms, social networks, and local contexts impact Startups' financing options · Investigate the necessity for adopting a comprehensive perspective that incorporates economic and sociocultural elements while examining the financing of Startups.
Cluster 9- Fintech Financing Frontiers	<ul style="list-style-type: none"> · Insufficient research on the unique challenges faced by Startups in specific developing countries or regions when adopting fintech solutions · Limited empirical research related to assessing the actual effectiveness and impact of fintech solutions on startup financing 	<ul style="list-style-type: none"> · Investigate regulatory hurdles, infrastructure limitations, or cultural factors that influence fintech adoption · Analyze data on SMEs' financial performance before and after adopting fintech, including metrics such as access to credit, growth rates, and financial inclusion.

	· Inadequate work on analyzing practical implementation of policy measures to support Startups in embracing fintech	· Assess the effectiveness of various policy interventions and their impact on Startup financing
Cluster 10- Addressing challenges and exploring alternative avenues in India	· Less work on integration of alternative financing channels with traditional banking	· Explore how the alternative financing channels can be effectively integrated with the existing banking system to better serve the financial needs of startups.
Cluster 11- Capital Structure of SMEs	· Paper conducted an empirical analysis of Italian SMEs as a whole	· Exploring how regional factors, including local economic conditions, regulatory environments, and cultural aspects, impact capital structure choices among SMEs could provide valuable insights.

Source: Authors Own

5. Conclusion, Future Research Direction, And Study Limitations

The point in time when startups will emerge as the primary catalyst for economic growth is rapidly approaching. Startups are anticipated to have a substantial impact on the gross domestic product (GDP) and employment rates, and are projected to play a pivotal position in the supply chain of major firms [133]. Hence, recognising the challenges associated with determining suitable financial resources is a crucial responsibility for policymakers. This study utilised bibliometric analysis to emphasise the persistent difficulties encountered by new businesses in a sample of 190 articles, chosen from a larger database of 1081 articles. 891 articles that did not correspond with the research theme were excluded from the initial dataset.

The primary aim of conducting this bibliometric study was to systematically gather and assess the prior research that was pertinent to the field of interest. This study seeks to address the existing research gap by employing bibliometric analysis to offer insights into the financial limitations experienced by small enterprises. The findings indicate that the study of financial limitations for small enterprises is consistently expanding [5], [27], [106], [128]. Based on the literature on entrepreneurial finance, it is challenging for new companies, innovative corporations, fast-growing organisations, and high-risk small businesses to secure bank financing [141]. Microdata and microlevel analysis are essential for comprehending the needs of startups and the capacity of innovative financial sector business models to fulfil those needs.

Over the past decade, the financial ecosystem has experienced significant changes, regardless of the ongoing effects of the global financial crisis on economies. Further inquiries could be undertaken to analyse tactics and protocols that promote smooth cooperation between banks and other funding sources. This endeavour aims to provide a comprehensive and inclusive financial ecosystem for startups. In order to improve the provision of financial services to entrepreneurs in India, this may entail an examination of regulatory frameworks, risk-sharing models, and optimal strategies for promoting coexistence and collaboration between banks and alternative financing sources.

It is necessary to enhance quantitative data with qualitative insights by conducting interviews with subject matter experts who are owners and managers. This approach aims to acquire a more comprehensive understanding of the impact of government aid, technology innovations, and investors' perspectives on their long-term strategy, investments, and decision-making processes. The significance of informal finance sources for startups is highlighted in many texts. Additional investigations could explore the many categories, availability, and efficacy of informal financial systems, particularly across diverse cultural and economic settings. The studies underscore the importance of networking in the context of financing for new ventures. However, there is an opportunity for further scholarly investigation into the intricacies of networking,

encompassing aspects such as the strategies employed by SMEs to establish and utilize networks, the influence of trust in networking dynamics, and the varying effects of networking on different categories of SMEs.

The present study has certain limitations. The methodology operates under the assumption that citations serve as the sole indicator of article quality. Consequently, it is possible that the study has overlooked publications of exceptional quality that have not yet garnered any citations. Hence, while our analysis provides insights for future scholarly investigations, the author has not specifically addressed underlying inquiries pertaining to the domain of financial accessibility, proactive actions by government authorities and investors, a supportive financial ecosystem, credit infrastructure, or the changing role of alternative financing sources.

It is crucial to understand that, even with our best attempts to include a wide range of earlier research projects that were carried out with a rigorous methodology, there can still be studies out there that are inaccessible or haven't been released in English. The exclusion of these studies in our review limits the conclusions that are offered ^[51]. The primary constraints of this review pertain to the topical breadth and source of the papers utilized. This review examined the issue of financial constraints within the setting of startups. Occasionally, the extensive scope of this subject matter resulted in uncertainty regarding the implementation of criteria for inclusion or exclusion throughout the research phase of the evaluation. Consequently, it is imperative to incorporate a multitude of words that facilitate the elucidation of this subject matter. The final constraint pertains to the utilization of a singular database, namely, Scopus. Although the relevance of this issue is noteworthy, it might be mitigated by employing multiple databases in subsequent studies, hence necessitating the removal of duplicate entries from the obtained results. In addition to the VOSviewer software and bibliometrix package, other bibliometric mapping tools can be utilized for the purpose of analyzing and presenting further visual insights.

Conflict of interest

The authors declare no conflict of interest.

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