

Thematic Knowledge Trend and Intellectual Structure on Scalability in Entrepreneurial Periphery: A Bibliometric Analysis

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Abstract

Entrepreneurial scalability denotes the potential capabilities of entrepreneurs to spread excellence within the enterprise as it grows and involves resource mobilization to achieve persistent growth. It includes the harmonization of new resources, shifting to the new identity of enterprise, revising the business functionality and the job role of human resources for internationalization of businesses. Thus, the domain is an emerging area and attracts academicians to develop research interests there. The present study hence aims to explore the thematic knowledge trend and intellectual structure of entrepreneurial scalability with bibliometric analysis (R Tool and VOSviewer 1.6.18). The data extraction criterion of the PRISMA model is considered for the selection of 371 studies from Scopus and Web of Science databases within the range of 1980 to 2024. The study extended its effort to highlight on the inter-temporal movement and decadal position of the thematic clusters based on the emergence of strongly related keywords such as social impact, innovation and scale up. The present study explores the cluster of 'Entrepreneurial skill and business growth', 'Social entrepreneurs and Innovation' etc. and proposes the avenues for future research on 'Gender Sensitization', 'Leadership style', 'Entrepreneurial cognition', and 'Serendipity' connected with the domain. It proves its importance by revealing the knowledge trend on scalability considered as the strategic precondition of entrepreneurial sustainability in the competitive business world.

Keywords -

Entrepreneur, Scalability, Gender, Bibliometric, Co-citation, Co-occurrence.

1. Introduction

Scalability in entrepreneurial periphery denotes the capacity to promote exponential value creation in an enterprise relative to its resources employed. It is supposed to be the entrepreneurial strategic precondition to get sustain in competition by adopting market changes without cost-quality compromise. It finds its shapes into four inter-link concepts like (i) scale up i.e. the persistence growth of business in form of resource, profitability and survival (Bondi,2000; Martinez et al.,2019; Palmie et al.,2023; Coviello et al.,2024), (ii) scale out i.e. the innovative products by enterprise and spreading of business operation through branching, affiliation, and partnership (Moore et al.,2015; Blozen et al., 2019), (iii) scale deep i.e. the socio-personal transformation of people of the allied regions and promotion of a sustainable initiative of enterprise (Moore et al.,2015; Blozen et al.,2019; Baldegger,2020; Islam,2021; Onwuegbuzie & Mafimisebi,2021) and (iv) rescale i.e. long-run achievements of predetermined targets with the latest technology and effective-efficient use of available resources (Picken, 2017; Onwuegbuzie & Mafimisebi,2021; Grillitsch et al.,2024). In the initial stage of growth, the enterprise performs on scale up and later moves on scale out, scale deep, and rescale (Onwuegbuzie & Mafimisebi,2021; Grillitsch et al.,2024). Hence, it pursues a concomitant practice of its scalability with the handholding of the four interdependent concepts (Moore et al., 2015; Blozen et al., 2019; Baldegger,2020; Onwuegbuzie & Mafimisebi, 2021). In the same context, expansion of an enterprise in a large area affects large people and acts as a mediator

between the scale up and scale deep strategies, i.e., enhancement of the social impact of enterprises with large scope (Moore et al.,2015; Blozen et al.,2019).

Scalability in enterprise additionally provides a scope for sustainable movement in the competitive environment for continuous long-term growth, revenue generation, replication of innovation in new markets, comprehensive social impact, and recycling of scarce resources (Patel,2014; Moore et al.,2015; Desantola & Gullati, 2017; Blozen et al., 2019; Arshi et al.,2020; Sajid, 2021; Aktas, 2021; Bohan et al.,2024). Thus, entrepreneurial scaling should obscure the need to focus on the sustainable growth and development of capacity which though fundamental to scaling, is still neglected and thus causes failure in enterprises due to the entrepreneurial structural weakness (Patel, 2014; Blozen et al., 2019; Islam, 2021). Literature (Martinez et al., 2019; Palmie et al., 2023; Coviello et al.,2024; Hanifzadeh et al.,2024) further endorsed that without relevant skill development, entrepreneurs may not access the scope to scale their potential. From a sustainability context, entrepreneurs can generate a scaling perspective only when they can offer value creation towards society, imposing no/low negative impact, like carbon emission, etc.

Hence, the theoretical and empirical journey of entrepreneurial scalability is most welcome by the academicians which was found confined to the field of science and technology till the 20th century only (Blommestein et al.,1980; Jogalekar&Woodside,1997; Cole &Eklund,1999; Bondi,2000), and after that, it was scattered in multiple streams like social science, Business Management Accounting; Finance and Entrepreneurship (Moore et al., 2015; Baldegger, 2020; Onwuegbuzie & Mafimisebi, 2021; Islam, 2021; Gao et al.,2021; Bohan et al.,2024). The thought from the multiple streams highlighted the importance of revealing a comprehensive study of the present knowledge area, followed by exclusive related themes. A few numbers of literature (Blommestein et al., 1980; Martinez et al., 2019; Blozen et al., 2019; Aldieri& Vicni, 2021; Bohan et al., 2024) was found to stretch their effort in the domain of entrepreneurial scalability, though a negligible of them (Bohan et al.,2024; Palmie et al., 2023; Coviello et al.,2024; Hanifzadeh et al.,2024) emphasised on the conceptualization of entrepreneurial scalability. Moreover, no study, till reviewed, extended its effort to focus on an in-depth decadal trend analysis on the concept of entrepreneurial scalability. Besides, as per knowledge goes, no study under this arena considered the research collaboration and thematic knowledge clusters on entrepreneurial scalability. These evidential gaps energize the present study to blend both the theoretical and empirical analysis to visualize the past trend and future avenues of the present domain of knowledge.

The present study, therefore, is to answer the following research questions (RQs):

RQ1: What is the current publication trend of research in the area of Entrepreneurial scalability?

RQ2: What are the themes of the most prolific articles in the research of entrepreneurial scalability?

RQ3: What are the inter-temporal movements of the Author's keywords and decadal position of thematic clusters found from co-occurrence analysis in the research domain?

RQ4: What is the intellectual structure of scientific discipline (co-citation) among authors in the research on entrepreneurial scalability?

RQ5: What are the future research avenues of the present study?

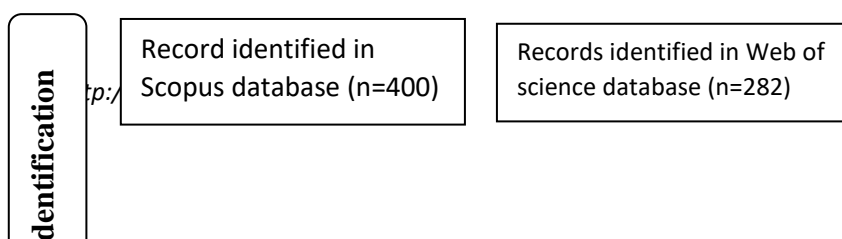
Hence, to answer the aforementioned questions, the present study highlights the data collection and methodology in the second section, while results and discussion are found in the third

section. The fourth section of the present study contains the future research avenue and conclusion with policy implications.

2. Data Collection and Methodology

The present study is exploratory in nature with an analysis of the past and future research trends on entrepreneurial scalability. It has selected its data on the basis of the subject areas, document types, publication stage, source type and language.

- **Data Collection and cleaning:** Data from 1980 to 2024 were collected from Scopus and Web of Science databases. In this regard, as any database is not free from vague/false bibliometric information, an extraction method with data sorting, locating and removing duplicate entries of articles has been applied to detect errors of inappropriate posting in the name of author, country, etc. In this effort, the present study has applied the bibliometrix approach of the R tool.
 - **Searching Tool:** For the present study, the terms Entrepreneurs OR Entrepreneurship OR Enterprise AND Scaling OR Scalability OR Scalable were used as search tools, where 'OR' is used for synonymous terms and 'AND' is used to combine two separate phrases.
 - **Screening:** to ensure consideration of a data for further analysis, the whole dataset is screened based on the presence of the terms, mentioned above, in the title, abstract, and the text of the research output.
 - **Subject Area:** 'Entrepreneurial Scalability' is a multidisciplinary concept covering Business Management, Social Science, Economics, Finance, etc.
 - **Document Type:** The study has taken only 'Articles' and 'Reviews' published in the aforementioned subject areas.
 - **Publication Stage:** The study has preferred to accept the 'final' stage of publication to get assurance and visibility of the research publication.
 - **Source Type:** The study has considered only 'Journal' for its analysis and rejected 'Conference Volume', etc., to maintain a specific quality standard.
 - **Language:** To reach out to the widest possible researchers and for international communication, English has been selected as the only language in the present study.
- The study has used R Studio for merging data collected from Scopus and Web of Science (WOS) databases and Visualization of Similarities (1.6.18) software for network mapping, etc.



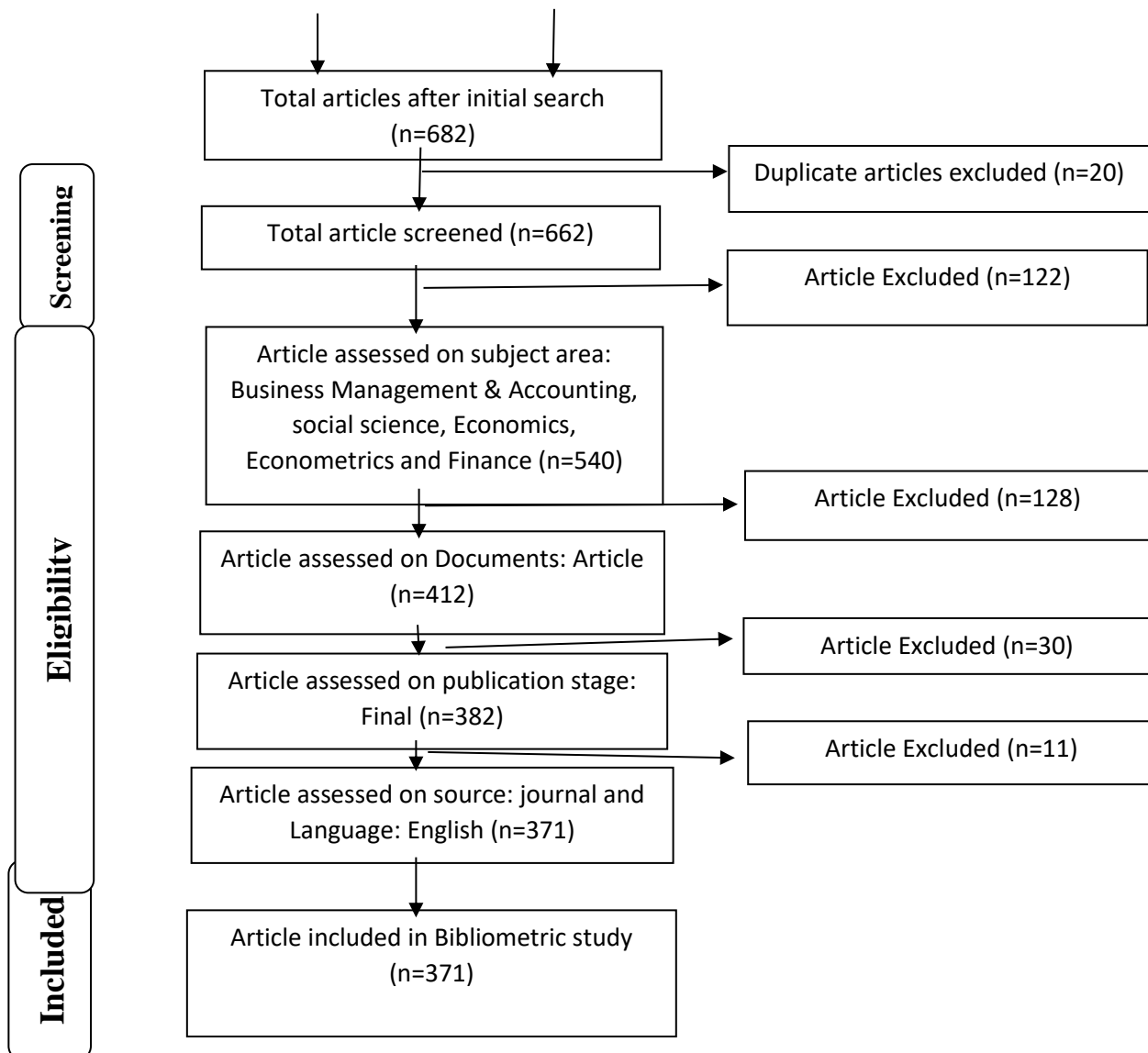


Figure 1: The PRISMA Model of the present study
Source: Author's compilation based on Scopus and WOS databases

3. Findings

3.1 Performance analysis - Year-wise publication on Entrepreneurial scalability:

The domain of knowledge started its journey in the year 1980 with the publication of the study 'Shopping Perceptions and Preferences: A Multidimensional Attractiveness Analysis of Consumer and Entrepreneurial Attitudes' by Blommestein, H., Nijkamp, P., & Van Veenendaal, W. The study emphasized the proactive skill of entrepreneurs to make compatibility between market demand and supply concerning reaching customer satisfaction. From 1980 to 2013, the number of publications remained very minimal, with only a handful of studies being published each year, while in 2000, 2003, 2005, and 2007, the domain was completely unoccupied. However, starting around 2014, there was a noticeable uptick in

research output, which was found to accelerate with substantial growth from 2020 onwards. The peak of this trend was traced in 2022, where the number of publications reached an all-time high of 48, while, in 2024, a subtle decrease in the number of publications (47) was observed. The growing depression in enterprises after 2020 necessitated the acquisition of knowledge of the domain, which hence energised the researchers to explore their study exclusively here. Figure 2 reveals the graphical representation of the yearly publication in the present domain of knowledge.

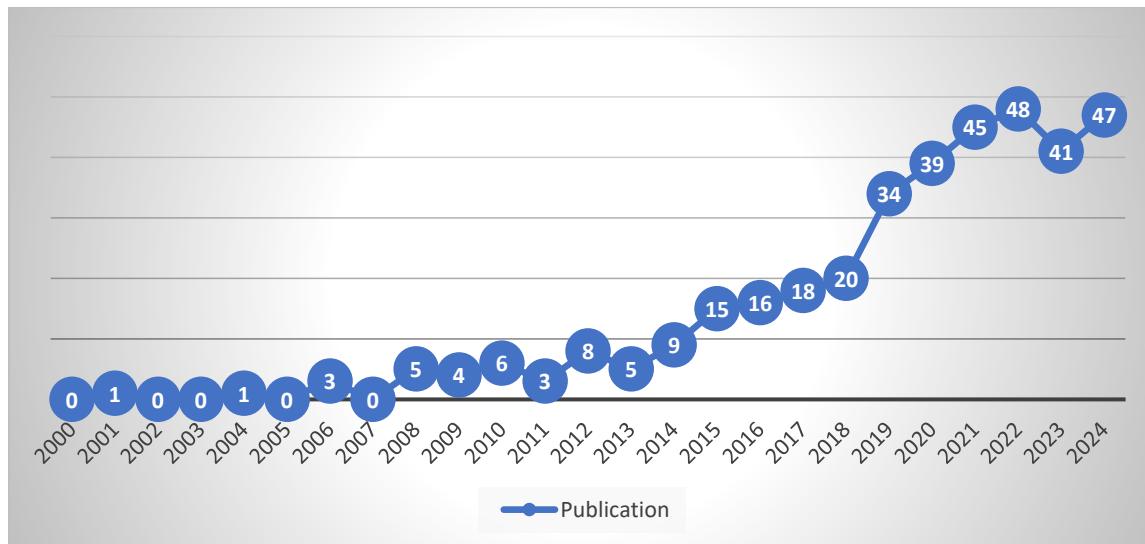


Figure 2 Year-wise publication on Entrepreneurial Scalability

Source: Author's compilation based on Scopus and WOS databases

3.2 Themes of the most prolific articles in the domain of entrepreneurial scalability

The most prolific study (Citation: 396) of research domain, 'New urban utopias of Postcolonial India: 'Entrepreneurial Urbanisation' in Dholera Smart City, Gujarat' by Datta, A (2015) argued entrepreneurial scaling up strategy as a robust business model for ensuring economic sustainability of a region though it could not uncover the concept of regional transformation i.e. 'scale deep'. The second most prolific article (Citation: 330), 'Making a difference: Strategies for scaling social innovation for greater impact' by Westley, F. and Antadze, N. (2010), emphasised the importance of a distinctive business model for social innovation shaped by social entrepreneurs. The study applied the 'diffusion theory of social innovation' i.e. how and why new ideas, practices, or technologies spread within a social system for entrepreneurial scaling though it did not emphasize on the technological advancement and innovation in the entrepreneurial setup. In 'Technology push and demand pull perspectives in innovation studies: current findings and future research directions' the next best prolific study by Di Stefano, G., Gambardella, A. and Verona, G. (2012) (citation: 312), technological advancement, innovation and progressive demand were considered as a means for scaling up of enterprises. Likewise, in 'Scale, change, and resilience in community tourism planning' (citation: 252) by Lew, A. A. (2014); 'Different types of social entrepreneurship: the role of geography and embeddedness on the measurement and scaling of social value' by Perrini, F., Vurro, C. and Costanzo, L.A. (2010) and 'A process-based view of social entrepreneurship from opportunity identification to scaling-up social change in the case of San Patrignano (citation: 211) by Smith, B.R. and Stevens, C.E. (2010) (Citation:224), stress was found to continue with the recovery plan for the

potential challenges of scalability of entrepreneurs where resilience business plan in light of technological advancement for sustainability and scaling of enterprises was emphasised significantly.

3.3 Thematic clusters and trends on Entrepreneurial scalability: A periodic review

The periodic thematic trends of entrepreneurial scalability can be addressed with co-occurrence analysis of the authors' keywords expressing the co-occurring entities within a collection of units (Zhou,2022) i.e. the relationships and patterns amongst the keywords in a research domain (Gao et al.,2021; Phan Tan,2021; Tan Luc,2022). In the present study, five decadal periods of study were accepted from 1980 to 2024 (1980 to 1989, 1990 to 1998, 2000 to 2009, 2010 to 2019, and 2020 to 2024) with the consideration of the year 1980 as the emergence of the concept of entrepreneurial scalability.

Study on entrepreneurial scalability from 1980 to 1989: The period held two articles without any keywords. Hence, the clusters were not formed. Blommestein et al (1980) were the beginners to shed light on this concept. The studies of this decade, though, explored the significance of the entrepreneurial contribution and government support to enrich the skill and growth of the enterprise; they ignored the other stakeholders, along with the emerging ecosystem needed to maintain entrepreneurial sustainability.

Study on entrepreneurial scalability from 1990 to 1999: The period was found to hold only one article (Buechler, 1995), which developed the concept of scale-up under entrepreneurial scalability. During the period, scale-up was denoted as a persistent business growth over the ups and downs of the business activities to achieve consistent profitability. The study emphasised the significant role of micro-lending institutions in offering financial strength but it bound entrepreneurial growth to only their profit-earning capacity.

Study on entrepreneurial scalability from 2000 to 2009: The articles of this decade explored the concept of business expansion in different geographical locations i.e. scale out with an extension of the concept and contribution of scale up towards entrepreneurial scalability. In this decade, a total of 42 keywords were found of which 18 keywords formed a network with at least one-time occurrence under three clusters as mentioned below.

Cluster 1: The study of the first cluster was concentrated in 2004-2006, with two articles. The major theme that binds this cluster was the source of finance/credit for the scale up of entrepreneurs (Rosengard, 2004). It focused on the earning stability, incremental profitability and availability of finance from banks and other FIs for entrepreneurial scalability.

Cluster 2: The cluster was framed with two studies by Vansandt et al. (2009) and Bachev (2008), where various forms of entrepreneurship (Social entrepreneurs vs profit-oriented entrepreneurs) prevailing in a region with low risk-taking ability were addressed. The cluster emphasised a specific entrepreneurial quality required to become successful in scaling up enterprises like positive attitude, managerial qualities, relevant business model, etc., though it was not found to emphasise the need for finance, technology, good infrastructure, etc., towards the entrepreneurial scaling up process.

Cluster 3: The major theme of the cluster was strategies of scale up of entrepreneurs with keywords such as performance effect of marketing actions, pricing model, scalability, and venture sustainability. The study concluded that a technology-based enterprise could scale up

at large (Bachev, 2008). The initiative taken by enterprises regarding diversification of the existing markets and expansion of customer base, replication of their societal aim would collectively be known as the different pathways of entrepreneurial scaling, i.e., scale up and scale out (Vansandt et al., 2009).

Study on entrepreneurial scalability from 2010 to 2019: In this decade, 134 articles were found on social entrepreneurs and their innovation with sub-themes of social innovation, social impact, business model, and scalability. Under this cluster, a total of 12 keywords were selected for analysis considering the discretionary criterion of having five or more occurrences. The initial period (2010-2011) of the decade evidenced innovation as a specific quality of entrepreneurial scalability whereas recycling and reallocation of resources were found to be significant in 2014-2015 for entrepreneurial scalability. The last ladder of the decade (2017-2018) focused on social entrepreneurship as a form to ensure an entrepreneurial, sustainable movement.

Cluster 1: The first cluster contained 24 articles from 2014 to 2017 containing the quality of innovative social entrepreneurs like novelty, innovative ideas etc. to get scalable (Dase & Koch, 2014; Beckmann & Zeyen, 2014) though, the cluster was not found to emphasise on the business assets, new business ideas, and validation of ideas in the market for innovation and thus for scalable enterprises.

Cluster 2: With its 5 articles published during 2016 to 2018, the cluster concluded that the sustainability of an enterprise would depend on its innovation of products and services in the present era of resource-constrained competitive business environment (Ziaee et al., 2016). The enterprises worked in a resource management process comprised of acquiring resources, bundling, levelling, reallocation, and recycling of resources to access sustainability and scalability. Resilience management, incubators and bricolage were also the catalysts for overcoming the challenges of scalability and sustainability and thus required further attention.

Cluster 3: The 12 articles (2014-2016) of Cluster 3 indicated a theme of social impact for entrepreneurial scalability with the keywords like scaling and social impact. The cluster concluded that a strong resource management process, outsourcing and network creation in society would have a potential result in social impact of innovation (Andre & Pache, 2016). The cluster argued in favour of the entrepreneurial effort in maintaining the socio-ethical values and regional economic development to confirm sustainability in a competitive environment.

Cluster 4: The fourth cluster on the theme of scaling up of social entrepreneurs was based on ten articles published during the period 2016-2017. The cluster concluded that there would be two pathways that prevailed for scaling, i.e., scale depth and scale breadth. They would be more influential on society as social change would lead to cultural change (Desantola & Gullati, 2017).

Study on entrepreneurial scalability from 2020 to 2024: The 220 documents were found clubbed in the last ladder of the research era on entrepreneurial scalability which supported the sustainability of entrepreneurs along with the sub-themes of enterprise ecosystem, SDG goal, corporate social responsibility, social impact, inclusion, and COVID-19. The 14 keywords were found to form a network with four clusters selected discretionally based on the criterion of at least five times of occurrence.

Cluster 1: The first cluster comprised of 32 articles with keywords, viz., entrepreneurship, innovation, and scaling up from 2021 to 2022 and contributed a theme of innovation in entrepreneurship. The cluster recommended that the social innovation of entrepreneurs acted as a pathway to address the global challenges, viz. poverty eradication, health maintenance, and environment deterioration (Aldieri & Vicni, 2021). The studies on risk management and social embeddedness hence claimed to have further concentration.

Cluster 2: The second cluster focused on the theme of scaling of social entrepreneurs and social impact with 20 studies from 2021-2022. The social impact of entrepreneurs was enhanced through understanding consumer behaviour, a collaboration between stakeholders, product diversification, and product mix, along with proper balancing amongst financial impact, social impact, and enterprise development (Islam, 2021; Hanifzadeh et al., 2024). It could be a mechanism for achieving systematic change, enhancing the welfare of local people and society.

Cluster 3: The third cluster consists of 14 empirical studies from 2021 to 2022 on the theme of entrepreneurial sustainability during the period of COVID-19. The study concluded that the challenges during the pandemic period (accessibility of target customers, prediction on customer demand and lack of funds) could be overcome with digital platforms.

Cluster 4: The social innovation of entrepreneurs was the theme of the present cluster from 2021 to 2024 with 14 studies. The social entrepreneurs were found to share their business experiences with entrepreneurial education and training programs which were traced to enhance the feasibility of social innovation and scaling (Santos et al., 2023; Bohan et al., 2024; Coviello et al., 2024).

Table-1 presents the network mapping of authors' keywords and themes of clusters from 1980 to 2024, while Figure-3 represents one Co-occurrence map of authors' keywords in Entrepreneurial scalability, as the network formation and clusters are not available in the first three decades.

Figure 4 reveals the importance of entrepreneurial scalability in the domain of research with the tool of word cloud performed with Biblioshiny (R tool). It denotes the frequency of appeared keywords in the present study field. The keywords in prominent circles (entrepreneurship, sustainability, innovation, economic growth) denote the notable studies on this domain and the smaller one (scaling, social impact, business model, micro finance) indicates nominal studies in the concerned fields which reveal the scope of further studies there also.

Table1: Network Mapping of authors' keywords and themes of clusters between 1980 to 2024.

Years	1980-1989	1990-1999	2000-2009			2010-2019				2020-2024			
Number of clusters	-	-	1 st	2 nd	3 rd	1 st	2 nd	3 rd	4 th	1 st	2 nd	3 rd	4 th
Period of cluster	-	-	2004-2006	2007-2009	2009	2014-2017	2016-2018	2014-2016	2016-2017	2021-2022	2021-2022	2021-2022	2021-2024
The theme within cluster	-	-	Source of Credit	Traits of Entrepreneurs	Strategies of scale up	The innovative quality of entrepreneurs	Innovation and sustainability	Scalability of social impact	Scaling up social entrepreneurs	Innovation of entrepreneurs	Scaling of social entrepreneurs and social impact	Sustainability of Entrepreneurs during COVID-19	Social innovation of the enterprise
Key words and number of occurrences	-	-	Banking (1)	Charter school (1)	Performance effectiveness of marketing actions (1)	Business model (6)	entrepreneurship (20)	Scaling (20)	Scale up (7)	Entrepreneurship (86)	Social entrepreneurship (31)	Sustainability (7)	Social enterprise (16)
			development (1)	Entrepreneurship (3)	Pricing model (1)	India (6)	innovation (7)	Social impact (6)		Innovation (14)	Scaling (19)	Covid-19 (6)	Social innovation (6)
			Finance (1)	Imprinting (1)	scalability (1)	scalability (7)	Social Enterprise			Scale up (5)	Social impact (6)	Social enterprise (5)	Inclusion (5)

							(14)						
			Mic rofi nan ce (1)	Man age ment (1)	Vent ure suste nanc e (1)	Socia l entre prene urshi p (36)	susta inabi lity (8)			Afric a(5)	Scali ng social impa ct (5)		
			Ngo (1)	susta inabi lity (1)		Socia l inno vatio n (8)							
			Scal ing- dow n (1)										
			Scal ing- up (1)										
			soci al (1)										
			sust aina bilit y (1)										
Num ber of studi es	2	1	14			134				220			

: The author's computation is based on the Scopus and WOS Databases

Note: There is no cluster formed in the first (1980-1989) and second decade (1990-1999). In the third decade, the minimum number of occurrences of keywords is one as the number of keywords and articles is less compared to the fourth and fifth decades.

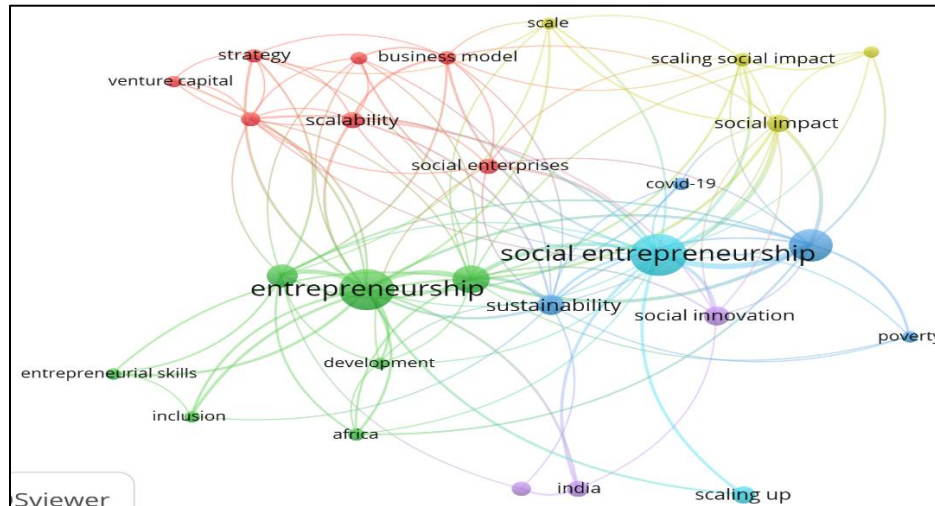


Figure 3: Co-occurrence map of Author's keywords in Entrepreneurial scalability Figure 4: word cloud of Authors keywords on Entrepreneurial scalability

Source: Author's compilation based on the Scopus and WOS databases

Source:

Authors compilation based on Scopus, WOS and Biblioshiny

3.4 Knowledge foundation of Entrepreneurial scalability through co-citation analysis

Co-citation analysis constructed a theoretical foundation of research domain through revealing the knowledge structure of disciplines that meaningfully explore the co-cited references of that knowledge field (Tan Luc et al., 2020; Phan Tan, 2021). Figure 5 depicted the co-citation map of authors based on 20 minimum citations considered discretionally. In this analysis, 103 inter-linking items were detected in three clusters- **Red** (Sustainability of Entrepreneurs), **Green** (Social entrepreneurship and scaling strategies) and **Blue** (Entrepreneurial Theories and Methodologies for scalability).

Amongst the author's co-citation profile, Mair & Marti (2006) (Green node) shared maximum link strength with the rest of the studies. They referred to the variant interlinked forms of entrepreneurial scaling strategies (scale up, scale out, scale deep, and rescaling) which were

traced to link with the entrepreneurial sustainability (Red node), complying with the principles of triple bottom line (Eisenhardt, 1989). But the study of Mair & Marti (2006) was found to suffer from not considering the theoretical foundation of successful entrepreneurial scaling strategies, which was addressed by the studies under the cluster of the Blue node. The studies hence considered five major theories, viz. resource dependency theory (navigating the influence of external resources for survival and competitive advantages of enterprises), contingencies theory (performance optimization of firm in changing business environment), creation theory (interaction of business action and market with which the entrepreneurs create opportunity), discovery theory (entrepreneurs with their unique alertness could identify and exploit the business opportunity which were already objectively present in the business world), and innovation diffusion theory (dealt with the capacity of adoption and spreading of new ideas, products and technology within the market by the business entity) for meeting successful entrepreneurial scaling and sustainability (Bloom & Smith, 2010; Baker & Nelson, 2005). The multivariate data analysis methods were deployed with the innovation diffusion theory and contingency theory (Bloom & Smith, 2010) in this regard.

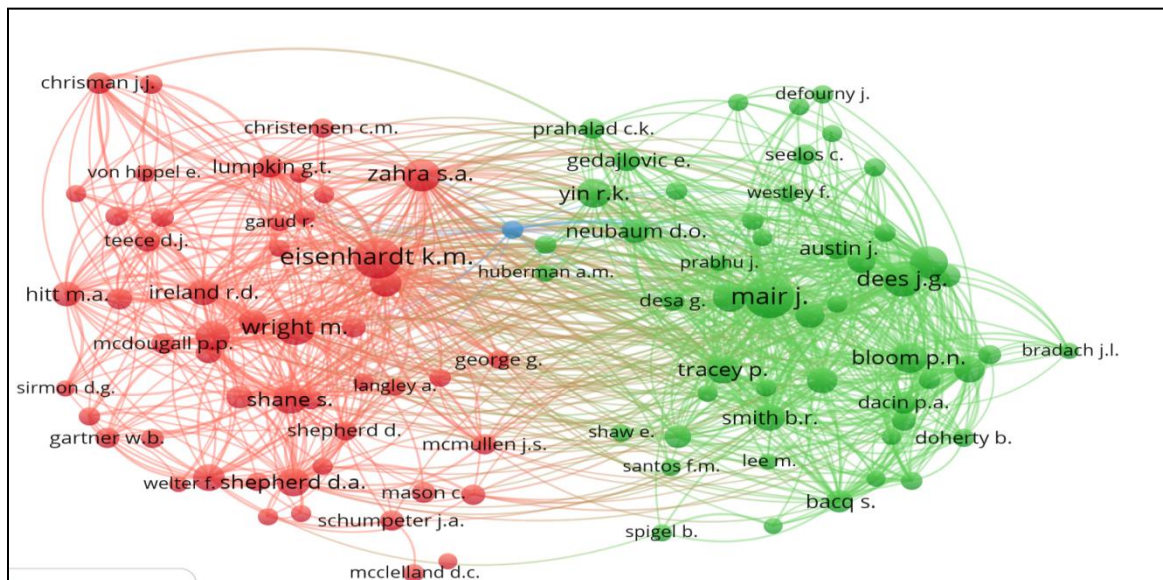


Figure 5 Co-citation Analysis on the Author's citation in the domain of Entrepreneurial scalability

Source: Author's compilation based on Scopus and WOS Databases

4. Discussion and conclusion: where do we go from here?

4.1 Discussion

The present research domain found its knowledge foundation in entrepreneurial scaling strategies and sustainability in the form of innovation and societal impact of entrepreneurs. Assessing the themes of the study of entrepreneurial scalability, the cluster 'entrepreneurial skill and innovation' of the first two decades revealed the significance of overall development of entrepreneurs with orientation programmes, capacity to generate innovative products and services. The prolific studies under this cluster deal with the product innovation required for confirming entrepreneurial scalability. The study pointed out the reluctant view of women entrepreneurs on applying innovative activities due to the reasons of socio-cultural obstacles and a lack of financial strength. Moreover, the scale out and scale deep strategies were missed in the nascent entrepreneurial periphery. Recognising the necessity to promote entrepreneurial

traits for social innovation, the theme ‘entrepreneurial skill and innovation’ was highly recommended, which hence confirmed entrepreneurial scaling (scale out and scale deep). It also revealed the underlying entrepreneurial theories and methodologies for successful entrepreneurial scaling. The studies under this cluster though promote social innovation for performing, did not encounter the significance of business model and scaling strategies and hence, the next cluster, i.e., ‘business model innovation’ for ensuring the robust performance of the enterprise towards scalability and business environment, was keenly required to be highlighted. The studies under this cluster deal with the adoption of innovative business models to perform scale out and scale deep strategies in various geographic locations and the eras of technological advancement, though this did not consider small-sized enterprises and their specific problems. The last but not the least thematic cluster under scaling and sustainability of social entrepreneurs explored the importance of the social impact of their products and services carrying social utility. The inclusive growth of social impact of enterprises and their positive movement towards sustainable activities for a low carbon footprint, green energies were evidenced in an influential study of the cluster but the measurement of the social impact of women-led enterprises still requires special attention. Besides, the existing literature encountered the skill of entrepreneurship but the leadership style under the present domain remains uncovered. Furthermore, the role of the importance of Serendipity in enterprises i.e. giving value to the unexpected ideas and innovation in the business environment and gender Sensitization i.e. giving value and equality to both genders in the business environment were remain unmarked in the literature of entrepreneurial scalability.

4.2 Avenues for future research

4.2.1 Leadership Style and Entrepreneurial Scalability

Leaders with socio-cultural motives were more scalable than the personal-economic motivated leaders, confirming the efficiency in adoption of scale deep and rescaling strategies of scaling (Moore et al.,2015; Hanifzadeh et al.,2024; Palmie et al.,2024). The leadership style (transformational, transactional, autocratic, democratic, and participative) had a positive influence on situational adjustment required for scaling strategies and their long-term survival. It created a culture that would foster growth, innovation and employee empowerment; enabled the enterprise to adapt the changing product demand and achieved sustainable expansion. Effective leaders would empower their team by ensuring collaboration, delegating responsibilities, and providing opportunities for business success. Thus, the area pointed out some research questions like - How does leadership style influence on entrepreneurial scalability? Which leadership style is effective for gaining entrepreneurial scalability in different forms (scale up, scale out and scale deep)? How does leadership style motivate the enterprise to gain the different forms of entrepreneurial scalability?

4.2.2 Gender Sensitization and Entrepreneurial Scalability

Gender sensitization i.e. building a diverse and inclusive workforce beyond the gender binary in enterprise, would be supposed to be the pre-requisite for entrepreneurial scalability in the current competitive scenario (Kamasak et al.,2020; Exposito et al., 2023). In the enterprise, women usually would like to face unique challenges in persistent business growth (Hassan et al., 2021; Exposito et al., 2023). The effect, therefore, could be reflected in the market-entry choices of the women entrepreneurs who generally inclined towards the home chores and hence lacked basic commercial networks. Women-led businesses run smoothly due to their cooperative power with the family, society and personal (Brush et al., 2009). Women-led enterprises focused mostly on the scale deep and sustainability aspect for entrepreneurial

scaling as compared to scale up and scale out. In this very regard, gender socialization theory could be used to further understand undefined differences in socialization of men-women i.e. why men and women run their businesses in different yet equally effective ways. Though women's participation in entrepreneurial activities would be increasing, it would often be less dynamic with challenges in mentorship, networking, and funding issues. This might restrict their full potential to foster a more inclusive and scalable ecosystem of entrepreneurs. Thus, gender sensitization would be required for the creation of a more inclusive and equitable working environment for improving business outcomes. It could leverage a wide range of diverse talent, promote employee engagement and potentially expand the market share of the business for long-term success and scalability (Kamasak et al.,2020). Thus, the scenario generates some research questions like How does gender sensitization influence on entrepreneurial scalability? What challenge(s) does an entrepreneur face in establishing gender sensitized environment to achieve business scalability? How do women-led enterprises differ from men-led enterprises in respect of entrepreneurial scalability?

4.2.3 Entrepreneurial Cognition in Enterprise and Scalability

The entrepreneurial cognition would represent a behavioural pattern for elaboration and recognition of business complexities. This would promote creativity, innovation, and flexibility in business decisions of individual entrepreneurs ensuring persistent growth in enterprise scaling (Ireland et al.,2003; Joseph et al.,2023; Major, 2024). It would be the collective attributes of individual psychological attitudes that underscored its broader business impact. Entrepreneurial cognition towards scalability would extend beyond the behavioural attributes and aspirational goal of business and included the necessity for navigating the exponential growth over the normal business growth. Entrepreneurial cognition strove to establish business successes and persistent growth over discovery and business innovation. Entrepreneurial cognition towards scalability focuses on market dominance, optimisation of business processes, and efficiency in the system rather than consistence business development and new market entry. Hence, the domain pointed out some research questions: How does entrepreneurial cognition facilitate the development and business capability of enterprises? How does entrepreneurial cognition relate to the performance of enterprises on different scaling strategies? How does the cognitive flexibility affect the entrepreneur's innovation and business scalability?

4.2.4 Serendipity and Entrepreneurial Scalability

Serendipity indicated a business phenomenon of making surprising and valuable discoveries of unexpected products, services, and market space, acknowledged as essential to the organisation's success (Busch & Grimes,2023; Major, 2024). It worked opposite to the strategic management and required a lack of control over business operation. The scalability also would not support the identical execution of a pre-established business plan rather would undergo continuous experimental phases with significant unplanned changes, promoting the exponential growth of the business. It required the instruments such as serendipity events, leadership team, and strategic improvisation to navigate the complexity and challenges of persistent business growth. However, high-growth business firms operated under greater uncertainty, ambiguity, and simply not followed the initial business plan represented a greater belief in the luck factor, i.e., in the event of serendipity. This offered some research questions like which strategy and resources are favourable for going on serendipity? How does serendipity offer innovation for enterprise scaling? How much serendipity does facilitate the performance of enterprises on different scaling strategies?

Conclusion

With the bibliometric analysis (co-occurrence and co-citation), the present study attempts to recognise major research theme and their emergence in entrepreneurial scalability research over four decades. The present study considered a retrospective review of the entrepreneurial scalability progress since its inception in 1980 and found the interest of researchers in the 20th century. They began to give their active interest in 2006 and from 2014, the field experienced a continuous increase in publications. Multiple factors were found latent in the literature that contributed to the increasing trend of the present study. Research curiosity on the strategies of entrepreneurial scaling, along with framing of sustainable business models, technological advancements, risk management, social impact and innovation of entrepreneurs were found as the major drivers of the present study.

The first two decades of the 20th century (1980-1999) and their prevailing theme have become traditions in entrepreneurial research. These research traditions include the cluster of business growth and micro-entrepreneurship. The themes are entrepreneurial skill and knowledge, consumer perception, legal constraints, micro-entrepreneurs, profitability, credit, and gender diversity. Under the study of the third decade (2000-2009), clusters like strategies of scalability, scalable traits of entrepreneurs, pricing model, and scaling strategies (scale up, scale out, etc.) are considered as the emerging themes. The business models with scale deep, social impact, resource constraint and innovation are emerging themes of the fourth decade, whereas in the current period, the cluster of entrepreneurial sustainability emerges with the theme of social impact, scaling, inclusion, sustainability, and social enterprises.

The present study proves its policy implication by providing conceptual knowledge in the context of entrepreneurial scalability which seems significant in the domain of entrepreneurial sustainability in competitive environment. But like every study, the present study also has some limitations regarding data source (only Scopus and WOS) and citation analysis (not considering the probable negative meaning of high citation on a paper) due to time and resource constraints.

References

1. Aktas, M. (2021). *Scalability 101-how to run a scalable business*. <https://userguiding.com/blog/scalability/>
2. Aldieri, L., & Vinci, C. P. (2021). Scalability and commercialization in support of sustainable development goals. *Industry, Innovation and Infrastructure*, 979–988.
3. André, K., & Pache, A.-C. (2016). From caring entrepreneur to caring enterprise: Addressing the ethical challenges of scaling up social enterprises. *Journal of Business Ethics*, 133, 659–675.
4. Arshi, T. A., Rao, V., Islam, S., & Morande, S. (2021). SECURE—a new business model framework for measuring start-up performance. *Journal of Entrepreneurship in Emerging Economies*, 13(3), 459–485.
5. Bachev, H. (2008). Integration of dairy farms in the supply chain in Bulgaria. *Society and Economy*, 30(1), 93–109. <https://doi.org/10.1556/SocEc.30.2008.1.5>
6. Baker, T., & Nelson, R. E. (2005). Creating Something from Nothing: Resource Construction through Entrepreneurial Bricolage. *Administrative Science Quarterly*, 50(3), 329–366. <https://doi.org/10.2189/asqu.2005.50.3.329>

7. Baldegger, R. (2020). How a business model's sustainability and scalability interact. *Journal of the International Council for Small Business*, 1(3–4), 126–138.
8. Beckmann, M., & Zeyen, A. (2014). Franchising as a Strategy for Combining Small and Large Group Advantages (Logics) in Social Entrepreneurship: A Hayekian Perspective. *Nonprofit and Voluntary Sector Quarterly*, 43(3), 502–522.
<https://doi.org/10.1177/0899764012470758>
9. Blommestein, H., Nijkamp, P., & Van Veenendaal, W. (1980). Shopping perceptions and preferences: A multidimensional attractiveness analysis of consumer and entrepreneurial attitudes. *Economic Geography*, 56(2), 155–174. <https://doi.org/doi:10.2307/142933>
10. Bloom, P. N., & Smith, B. R. (2010a). Identifying the drivers of social entrepreneurial impact: Theoretical development and an exploratory empirical test of SCALERS. *Journal of Social Entrepreneurship*, 1(1), 126–145.
<https://doi.org/doi:10.1080/19420670903458042>
11. Bohan, S., Tippmann, E., Levie, J., Igoe, J., & Bowers, B. (2024). What is scaling? *Journal of Business Venturing*, 39(1), 106355.
12. Bolzan, L. M., Bitencourt, C. C., & Martins, B. V. (2019). Exploring the scalability process of social innovation. *Innovation & Management Review*, 16(3), 218–234.
13. Bondi, A. B. (2000). Characteristics of scalability and their impact on performance. *Proceedings of the 2nd International Workshop on Software and Performance*, 195–203.
14. Brush, C. G., De Bruin, A., & Welter, F. (2009). A gender-aware framework for women's entrepreneurship. *International Journal of Gender and Entrepreneurship*, 1(1), 8–24.
15. Busch, C., & Grimes, M. (2023). Eureka!: Improving the Effects of Artificial Intelligence on Serendipitous Innovation. *Academy of Management Proceedings*, 2023(1), 11339.
<https://doi.org/10.5465/AMPROC.2023.11339abstract>
16. Buechler, S. (1995). The key to lending to women microentrepreneurs. *Small Enterprise Development*, 6(2), 4–15. <https://doi.org/10.3362/0957-1329.1995.013>
17. Cole, R., & Eklund, P. W. (1999). Scalability in formal concept analysis. *Computational Intelligence*, 15(1), 11–27.
18. Coviello, N., Autio, E., Nambisan, S., Patzelt, H., & Thomas, L. D. (2024). Organizational scaling, scalability, and scale-up: Definitional harmonization and a research agenda. *Journal of Business Venturing*, 39(5), 106419.
19. Datta, A. (2015). New urban utopias of postcolonial India: 'Entrepreneurial urbanization' in Dholera smart city, Gujarat. *Dialogues in Human Geography*, 5(1), 3–22.
<https://doi.org/10.1177/2043820614565748>
20. Desa, G., & Koch, J. L. (2014). Scaling Social Impact: Building Sustainable Social Ventures at the Base-of-the-Pyramid. *Journal of Social Entrepreneurship*, 5(2), 146–174.
<https://doi.org/10.1080/19420676.2013.871325>
21. DeSantola, A., & Gulati, R. (2017). Scaling: Organizing and growth in entrepreneurial ventures. *Academy of Management Annals*, 11(2), 640–668.
22. Di Stefano, G., Gambardella, A., & Verona, G. (2012). Technology push and demand pull perspectives in innovation studies: Current findings and future research directions. *Research Policy*, 41(8), 1283–1295.
23. Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14(4), 532. <https://doi.org/10.2307/258557>
24. Expósito, A., Sanchis-Llopis, A., & Sanchis-Llopis, J. A. (2023). CEO gender and SMEs innovativeness: Evidence for Spanish businesses. *International Entrepreneurship and Management Journal*, 19(3), 1017–1054. <https://doi.org/10.1007/s11365-021-00758-2>

25. Gao, S., Meng, F., Gu, Z., Liu, Z., & Farrukh, M. (2021). Mapping and Clustering Analysis on Environmental, Social, and Governance Field a Bibliometric Analysis Using Scopus. *Sustainability*, 13(13), Article 13. <https://doi.org/10.3390/su13137304>
26. Grillitsch, M., Asheim, B., Lowe, N., Kelmenson, S., Fünfschilling, L., Lundquist, K.-J., Mahmoud, Y., Martynovich, M., Mattsson, P., Nilsson, M., Miörner, J., & Schubert, T. (2025). Rescaling: Change agency and the emerging geography of economic relationships. *Progress in Human Geography*, 49(1), 4–26. <https://doi.org/10.1177/03091325241288337>
27. Hanifzadeh, F., Talebi, K., & Jafari-Sadeghi, V. (2024). Scalability of startups: The impact of entrepreneurial teams. *Journal of Global Entrepreneurship Research*, 14(1), 15. <https://doi.org/10.1007/s40497-024-00383-7>
28. Hassan, O. H., Sobaih, A. E. E., & Elshaer, I. A. (2022). The impact of women's empowerment on their entrepreneurship intention in the Saudi food industry. *Journal of Risk and Financial Management*, 15(12), 571.
29. Hassan, U. A. (2021). *Impact Of Women Entrepreneurs And The Growth Of Small Scale Enterprises In Yobe State*.
30. Islam, S. M. (2021). Social impact scaling strategies in social enterprises: A systematic review and research agenda. *Australian Journal of Management*, 47(2), 298–321.
31. Ireland, R. D., Hitt, M. A., & Sirmon, D. G. (2003). A model of strategic entrepreneurship: The construct and its dimensions. *Journal of Management*, 29(6), 963–989.
32. Jogalekar, P., & Woodside, C. (1997). A scalability metric for distributed computing applications in telecommunications. In *Teletraffic Science and Engineering* (Vol. 2, pp. 101–110). Elsevier.
33. Joseph, M. L., & Godfrey, N. (2023). A New Mindset: From Tasks to Professional Identity. *Nurse Leader*, 21(2), 183–187. <https://doi.org/10.1016/j.mnl.2022.12.007>
34. Kamasak, R., Ozbilgin, M., Kucukaltan, B., & Yavuz, M. (2020). Regendering of dynamic managerial capabilities in the context of binary perspectives on gender diversity. *Gender in Management: An International Journal*, 35(1), 19–36.
35. Lew, A. A. (2014). Scale, change, and resilience in community tourism planning. *Tourism Geographies*, 16(1), 14–22. <https://doi.org/doi:10.1080/14616688.2013.864325>
36. Mair, J., & Marti, I. (2006). Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of World Business*, 41(1), 36–44.
37. Major, B., Testa, M., & ByIsms, W. H. (2024). Responses to upward and downward social comparisons: The impact of esteem-relevance and perceived control. In *Social comparison* (pp. 237–260). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781003469490-12/responses-upward-downward-social-comparisons-impact-esteem-relevance-perceived-control-brenda-major-maria-testa-wayne-byisms>
38. Moore, M.-L., Riddell, D., & Vocisano, D. (2015). Scaling out, scaling up, scaling deep: Strategies of non-profits in advancing systemic social innovation. *Journal of Corporate Citizenship*, 58, 67–84.
39. Onwuegbuzie, H. N., & Mafimisebi, O. P. (2021). Global relevance of scaling African Indigenous entrepreneurship. *Technological Forecasting and Social Change*, 166, 120629.
40. Palmié, M., Parida, V., Mader, A., & Wincent, J. (2023). Clarifying the scaling concept: A review, definition, and measure of scaling performance and an elaborate agenda for future research. *Journal of Business Research*, 158, 113630.

41. Patel, S. (2014). *Seven challenges that can sink even successful companies*.
<https://www.entrepreneur.com/growing-a-business/7-scaling-challenges-that-can-sink-even-successful-companies/240887>
42. Perrini, F., Vurro, C., & L, A. C. (2010). A process-based view of social entrepreneurship: From opportunity identification to scaling-up social change in the case of San Patrignano. *Entrepreneurship and Regional Development*, 22(6), 515-534.
<https://doi.org/doi:10.1080/08985626.2010.488402>
43. Phan Tan, L. (2021). Mapping the social entrepreneurship research: Bibliographic coupling, co-citation and co-word analyses. *Cogent Business & Management*, 8(1), 1896885. <https://doi.org/10.1080/23311975.2021.1896885>
44. Picken, J. C. (2017). From startup to scalable enterprise: Laying the foundation. *Business Horizons*, 60(5), 587–595.
45. Rosengard, J. K. (2004). Banking on Social Entrepreneurship: The Commercialization of Microfinance. *MondesEnDéveloppement*, no 126(2), 25–36.
<https://doi.org/10.3917/med.126.0025>
46. Sajid, A. (2021). Scaling a business: best strategies to use and mistakes to avoid. *Scaling a business: effectively scale your business in 2020*.
<https://www.forbes.com/sites/forbescoachescouncil/2022/03/14/scaling-a-business-best-strategies-to-use-and-mistakes-to-avoid/>
47. Santos, S. C., Liguori, E. W., & Garvey, E. (2023). How digitalization reinvented entrepreneurial resilience during COVID-19. *Technological Forecasting and Social Change*, 189, 122398. <https://doi.org/10.1016/j.techfore.2023.122398>
48. Smith, B. R., & Stevens, C. E. (2010b). Different types of social entrepreneurship: The role of geography and embeddedness on the measurement and scaling of social value. *Entrepreneurship and Regional Development*, 22(6), 575-598.
<https://doi.org/doi:10.1080/08985626.2010.488405>
49. Tan Luc, P., Xuan Lan, P., Nhat Hanh Le, A., & Thanh Trang, B. (2022). A Co-Citation and Co-Word Analysis of Social Entrepreneurship Research. *Journal of Social Entrepreneurship*, 13(3), 324–339. <https://doi.org/10.1080/19420676.2020.1782971>
50. Vansandt C.V., Sud M., Marme C. (2009). Enabling the original intent: Catalysts for social entrepreneurship. *Journal of Business Ethics*.
51. Villar-Martínez, A., Rodríguez-Gil, L., Angulo, I., Orduna, P., Garcia-Zubia, J., & López-De-Ipiña, D. (2019). Improving the scalability and replicability of embedded systems in remote laboratories through a cost-effective architecture. *IEEE Access*, 7, 164164–164185.
52. Westley, F., & Antadze, N. (2010). Making a difference: Strategies for scaling social innovation for greater impact. *Innovation Journal*, 15(2). https://ccwestt-ccfsimt.org/wp-content/uploads/2023/06/strategies_for_scaling_social_innovation.pdf
53. ZiaeeBigdeli, A., Li, F., & Shi, X. (2016). Sustainability and scalability of university spinouts: A business model perspective. *R&D Management*, 46(3), 504–518.
<https://doi.org/10.1111/radm.12167>
54. Zhou, X., Zhou, M., Huang, D., & Cui, L. (2022). A probabilistic model for co-occurrence analysis in bibliometrics. *Journal of Biomedical Informatics*, 128, 104047