

Gupta, Anju; Mishra, Shekhar; Behera, Deepak Kumar

Article

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Tracing the trajectory of financial vulnerability: a systematic review and bibliometric analysis

Anju Gupta^a , Shekhar Mishra^a  and Deepak Kumar Behera^b 

^aDepartment of Commerce, Manipal Academy of Higher Education (MAHE), Manipal, India; ^bEconomics and Finance Department, The Business School, RMIT University, Ho Chi Minh City, Vietnam

ABSTRACT

Over the span of 40 years, a substantial number of conceptual and empirical studies have been conducted on financial vulnerability (henceforth **FV**). These studies primarily covered socioeconomics, finance, management, and medicine. However, there is a paucity of comprehensive reviews and scientific mapping of the extant literature in the FV domain. Bibliometric analysis attempts to provide quantitative and qualitative knowledge in this area. This study was based on a review of 475 articles published in Scopus-indexed journals from 1990 to 2023. The present study employed the Biblioshiny R studio Bibliometrix package for data extraction and analysis. Our analysis provides information on recent publication trends; prominent authors, institutes, and countries; citations; thematic groups; keyword analysis; and social network analysis to identify influential work in this research domain and future gaps. The present analysis contributes to consolidating the existing fragmented literature on FV and highlights its significance during the current pandemic. Additionally, the study would be useful for researchers, practitioners, and academicians to proceed to further explore the area and outline the trends and their empirical investigation.

IMPACT STATEMENT

Over the span of 40 years, a substantial number of conceptual and empirical studies have been conducted on financial vulnerability. Thus, this paper provides a comprehensive overview of the evolution of financial vulnerability research, utilizing both systematic review and bibliometric analysis to map trends, key themes, and influential works. By synthesizing existing literature and visualizing the network of scholarly contributions, this study highlights the critical factors and providing the future research directions in the field. The findings offer valuable insights for researchers, policy-makers, and practitioners, aiding in the formulation of strategies to mitigate financial vulnerability and promote financial resilience in diverse socioeconomic contexts.

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1. Introduction

The Covid-19 pandemic has pushed the global economy into a financial crisis, straining household financial conditions. This economic downturn and worldwide pandemic have made households financially vulnerable. Earlier, poorly educated and unemployed individuals were considered prone to financial vulnerability (henceforth FV) (Loke, 2017). However, with the outset of the pandemic situation, even higher-income individuals can become financially vulnerable (Kalil et al., 2020; Salisbury et al., 2022). According to survey data from the FIS,¹ younger families are more prone to FV. 48% of the respondents did not have enough funds to handle unexpected financial shocks. The increased debt burden coupled with mortgages and loans elevated the adversity of the households (Lusardi et al., 2019). Therefore, knowledge of FV eventually becomes the most crucial determinant for overcoming these financial challenges.

CONTACT Shekhar Mishra  shekhar.mishra@manipal.edu  Department of Commerce, Manipal Academy of Higher Education (MAHE), Manipal, Karnataka 576104, India

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However, FV has been explored in a wide array of research domains such as marketing (Baker et al., 2005; Shultz & Holbrook, 2009), finance (Hahm et al., 2013) economics (Anderloni et al., 2012), psychology (Shah et al., 2012), and health (Lachs & Han, 2015). Surprisingly, no universally accepted definition of FV and its dimensions exists until recently. At the same time, a plethora of studies used this construct in varied contexts; most, if not all, of them, developed idiosyncratic measures of FV and applied accordingly to solve specific research problems (e.g., Abdullah Yusof et al., 2015; Brunetti et al., 2016; Prawitz et al., 2006) without defining the construct in a wholesome manner. Further, the term “FV” has often been used interchangeably with words like “financial fragility” and “financial distress” (Ali et al., 2020; Daud et al., 2018), demonstrating vagueness in their usage.

To address this research gap O'Connor et al. (2019) formally defined FV as “likelihood that an individual will experience financial hardship” where financial hardship has been conceptualized as “a state of distress in which an individual is unable to maintain their standard of living” (O'Connor et al., 2019, p. 422, Whelan, 2001). A recent definition suggests that it is subjective in nature, as it is based on how individuals perceive it, irrespective of the objective or real state of their financial condition. This also means that an individual's FV is idiosyncratic and someone else cannot evaluate the state of another person's financial status.

In addition, it is a multi-dimensional construct, and there are various determinants of FV. These include personal spending, hedonic behaviour (Gupta & Mukherjee, 2024) short-sightedness, inappropriate money management, low income (Ziliak, 2015) individuals' education level, unemployment, indebtedness (Costa & Farinha, 2012), sudden impactful changes in financial status (Midões & Seré, 2022) and the psychological and physiological health of individuals (Bialowolski & Weziak-Bialowolska, 2014; Hoffmann & McNair, 2018). Extant research “narrowly” used objective variables, such as income and debt ratios, credit history, and income statements to demonstrate FV (Anderloni et al., 2012; Noerhidajati et al., 2021) and subjective variables, such as individuals' attitudes and opinions about their financial conditions (Haushofer & Fehr, 2014; Mani et al., 2013).

Research on FV has experienced unprecedented growth in recent times, driven by its undisputable importance for individuals and institutions in the global economic landscape. This increase in the number of empirical investigations in the domain of FV has been effectively summarized by recent research syntheses (e.g., Fernández-López et al., 2023; Leandro & Botelho, 2022; Lee & Sabri, 2017). While the review by Fernández-López et al. (2023) typically focused from 2000–2022 and on the phenomenon of consumer FV, Leandro and Botelho (2022) review moved beyond these phenomena and discussed the facets of consumer over-indebtedness and consumer credit. These works explored the diverse literature on FV, focusing on salient consumer behaviour and decision-making activities, theoretical underpinnings, conceptual frameworks, methodologies, and future research directions. While these reviews are meritorious in their own rights, a broader insight in this domain through a bibliometric review would be helpful in comprehending the entirety of the domain from the reader's perspective. Unlike the previous reviews, our study extends the analysis over an extensive timeline (1990–2023), capturing the evolution of this domain over three decades and thus providing a comprehensive historical perspective. Also, our review incorporates a wider array of factors associated to FV, including socio-economic, financial, psychological and contemporary situations. This holistic approach allows a nuanced understanding of the multifaceted nature of FV. This comprehensive and bibliometric science driven approach not only enhances the understanding of FV but also direct the pathways for future research and practical implications in a wider range, thus making a significant contribution to the field of finance and economic. The bibliometric technique is exclusive to the systematic literature review, as bibliometric reviews are “highly efficient and objective as they leverage on the power of technology for data collection” (Donthu et al., 2021; Ellegaard & Wallin, 2015), especially for review articles with a large corpus (i.e., hundreds of articles). Moreover, a bibliometric review of FV complements these syntheses by providing more empirical analysis related to the impact of the domain (e.g., citations) and stakeholders (e.g., institutions) (Donthu et al., 2021; Ramos-Rodríguez & Ruíz-Navarro, 2004).

This study makes several significant contributions to the FV literature. First, it led to the process of identification, exploration, and methodically organizing the priority areas within FV through a comprehensive review of academic papers published over the last three decades (1990–2023). Second, it enriches the understanding of this domain by including the scientific mapping of FV as a

multidimensional construct (O'Connor, et al., 2019; Daud et al., 2018). Third, by synthesizing and organizing the aforementioned findings, this study lays the groundwork for advancing the field while offering insights for future research directions. Finally, it provides valuable insights for policymakers and practitioners by shedding light on recent FV themes.

The remainder of the paper is structured as follows. Section 2 reviews the literature on FV. Section 3 discusses the data and method of the analysis, followed by Section 4, where the key results obtained from the bibliometric analysis of the FV area are discussed. Finally, in Section 5, the agenda for future research in this domain is provided, along with a discussion and conclusion.

2. Review of literature

The concept of FV has undergone significant exploration, with early research primarily focusing on the likelihood of facing financial challenges, particularly bankruptcy, among for-profit organizations (Altman, 1968). Tuckman and Chang (1991) introduced a seminal definition for non-profit organizations, which is "likely to cut back its (program) service offerings immediately when it experiences a financial shock." The definition frame FV as the propensity to swiftly reduce programs or services in response to financial stocks such as economic crises or decreased donations. Subsequently, they proposed a model incorporating four key financial indicators: the equity ratio, surplus margin, revenue concentration index, and administrative costs. Further studies by Greenlee and Trussel (2000) and Trussel and Greenlee (2004) expand on this framework by combining additional accounting variables. Hager (2001) applied the Tuckman and Chang (1991) model to predict the collapse of arts-based organizations, while Thomas and Trafford (2012) extended it to develop a Financial Exposure Index by introducing variations in the original four financial indicators. Bowman (2011) introduced a multi-dimensional perspective of FV, focusing on two temporal aspects (i.e., financial capacity and financial sustainability), particularly short-term profit-making over long-term capital gains for non-profit organizations.

FV extends beyond organizational contexts to the individual and household levels. Previous studies explored the FV of households with high debt or consumer loans (Kim et al., 2016; Anderloni et al., 2012). Scholars from the health and medical domains have studied FV with respect to individuals suffering from geriatric issues or stressful conditions that leads to increased debt (Lachs & Han, 2015; Mason et al., 2018; Turunen & Hiilamo, 2014). However, in addition to debt and liquidity considerations, many factors make individuals or households financially vulnerable. Households are financially vulnerable when they do not have enough funds and savings to face an unexpected financial emergency and are unable to maintain their present living standards (Pew Charitable Trusts, 2017), and are not able to enjoy their festival (Sachin et al., 2018).

Considerable research has been dedicated to investigating the factors/antecedents that lead to the FV of individuals and households. Such research is mainly driven by a growing consensus among scholars that the pandemic has led to a substantial reduction in income (Midões & Seré, 2022). The financial crisis made individuals and households more vulnerable worldwide, leading to increased unemployment, debt-servicing challenges, and financial emergencies (Van Aardt et al., 2009).

Some of the important determinants of FV are the indebtedness of households (Anderloni et al., 2012), level of income (Bridges & Disney, 2004), attitude towards money (Sabri et al., 2020), money management, financial literacy, and capabilities (Singh & Malik, 2022), risky credit behaviour (Burlamaqui & Kregel, 2005), financial characteristics of individuals, their financial preferences, and behaviours, and self-control (Rey-Ares et al., 2021). Xu et al. (2018) found that individuals' financial distress is influenced by their genetics, personality, and cognitive skills.

While a vast body of the literature already exists that explores the antecedents of FV, little is known about its consequences for individuals. Prior studies that attempted to investigate a few possible outcomes of FV document its effect on broader constructs, such as family and well-being, quality of life, success, happiness, mental health, and overall well-being of individuals (Hoffmann, & McNair).

Based on a summary of the literature in this domain and following their scope and methodology, this study aimed to answer the following research questions:

RQ1. What is the publication trend for FV research?

RQ2. What are the most influencing articles contributing to the FV?

RQ3. Which are the top contributing journals in FV research?

RQ4. Who are the prominent authors in FV research?

RQ5. What are the major themes on FV?

RQ6. What is the future scope of research on FV?

This study conducts a bibliometric review to answer the aforementioned research questions and contributes to the literature on financial vulnerability. The subsequent sections detail the database search and bibliometric analysis procedures.

3. Methods

In this scholarly review, the systematic literature review (SLR) approach was selected to amalgamate previous research findings (Blanco-Mesa et al., 2017), chosen of its ability to mitigate bias (Goyal & Kumar, 2020). This review adopts the “Scientific Procedures and Rationales for Systematic Literature Reviews”

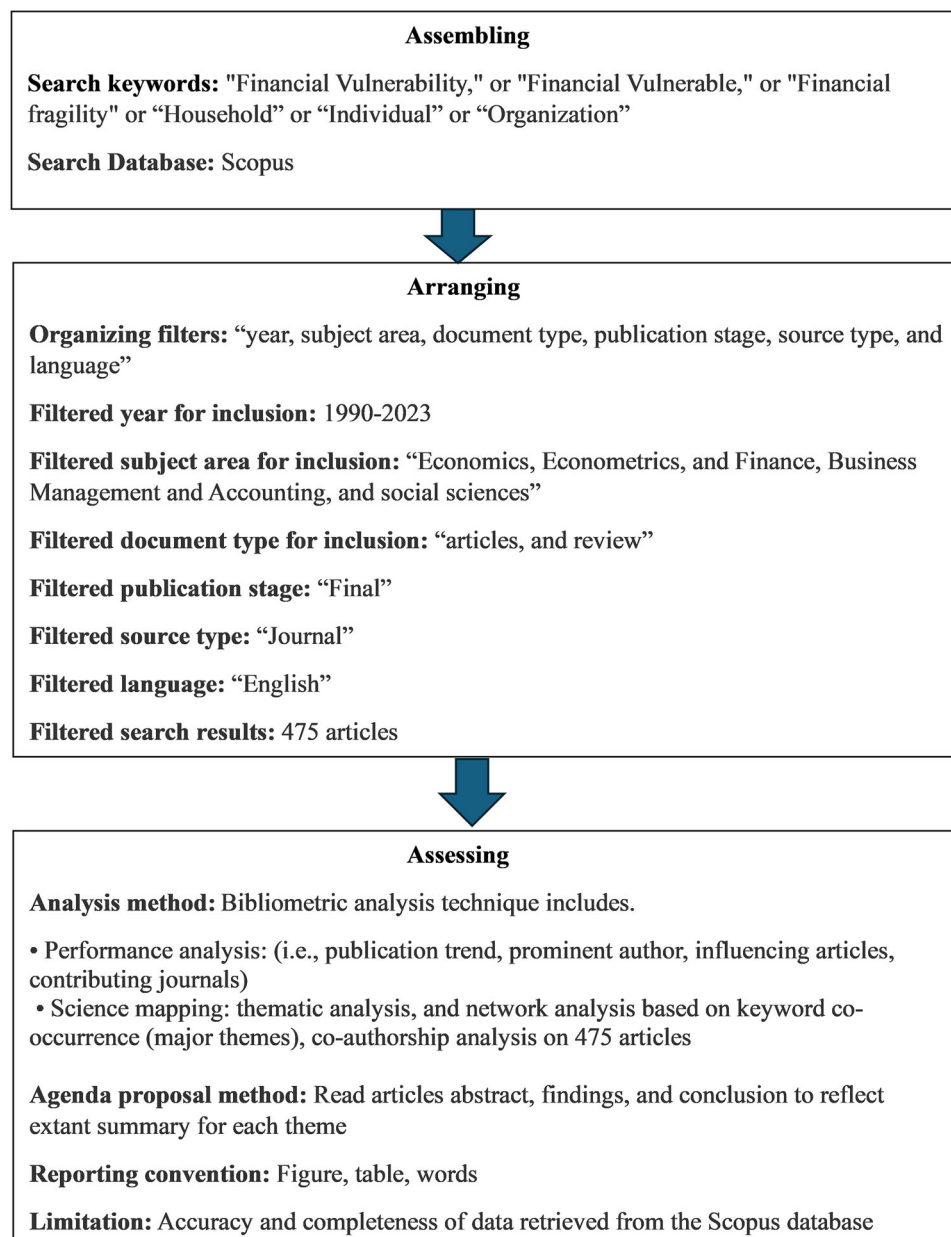


Figure 1. “SPAR-4 SLR” diagram.

(SPAR-4-SLR) criteria. The rationale underlying this selection stems from the acknowledged superiority of SPAR-4-SLR over the PRISMA Guidelines in terms of methodological rigor. Furthermore, the SPAR-4-SLR method is structured and based on three principal stages: “assembling,” “arranging,” and “assessing” articles, (Figure 1) as described by Paul et al. (2021). A delineation of the review criteria is presented below.

3.1. Assembling

We used the Scopus database to extract relevant documents for this study. Scopus is a renowned electronic database that provides a platform for notable publications from prominent journals and esteemed researchers (Paul et al., 2021). According to the information available on the Elsevier website, Scopus indexed approximately 25,000 journals, around 75 million publications and 1.4 billion citations. Scopus is frequently recommended by researchers for bibliometric reviews because of its extensive data (Donthu et al., 2021). The Scopus database was suitable for the study, in contrast to Google Scholar, because previous scholars have pointed out the citation biases and errors found in the Google Scholar database (Jensenius et al., 2018; Orduna-Malea et al., 2017) and criticized for not prohibiting predatory journals as well as the complexity involved in data extraction (Chapman & Ellinger, 2019). These concerns led us to restrain the use of Google Scholar for our literature search. Our search on Scopus was conducted between 1990 and 2023, using the “TIT-ABS-KEY” search query to target key terms such as “Financial Vulnerability,” “Financial Vulnerable,” “Financial distress,” or “Household Vulnerable,” and “Financial fragility.” The search string had these critical keywords linked by OR Boolean operator. This endeavour yielded 6,414 documents.

3.2. Arranging

Subsequently, rigorous inclusion and exclusion criteria were applied to refine the arrangement and selection of the most pertinent articles. The study used the category (code) function to the Scopus database to filter the gathered data according to “year, subject, document type, source, publication stage, and language.” The search strategies were confined to “1990-2023, Economics, Econometrics, Finance, Business Management, Accounting, and Social Sciences, articles, review, final, journal, and English” in those codes, respectively. This resulted in the inclusion of 2656 articles. Figure 2. A detailed flow of search and filtration process of research articles for bibliometric analysis. We excluded articles from unrelated fields (e.g., medical vulnerability, organisational distress) or used the term in a context irrelevant to personal finance or household economics. In addition, studies with little or no relation with finance, such as arts, physics, science, macroeconomics, etc., and studies where FV was measured through non-financial variables (chronic disease, poor consumption habits of alcohol and tobacco) were excluded from the studies. To ensure the inclusion of relevant articles, those articles were shortlisted for further analysis, which either focused on FV or financial distress (concept, measurement, determinants, and outcomes), articles dealing with a relatively wider and closely related concept “financial crisis.” Subsequently, duplicates were removed. Conversely, we excluded documents, such as conference proceedings, theses, book chapters, and papers published in languages other than English. In total 3785 articles were excluded based on above mentioned criteria.

Furthermore, the next selection procedure contains three steps to retrieve the most relevant articles for the study.

1. Screening and selecting articles published in the fields of Business, Management and Accounting, Econometrics and Finance, Economics, and Social Sciences.
2. We focused on published articles and reviews because they are deemed to offer certified knowledge (Ramos-Rodríguez & Ruíz-Navarro, 2004).
3. We did a thorough “title and abstract” reading to select core articles related to the domain. Using these filters, the initial pool size was reduced to 486.

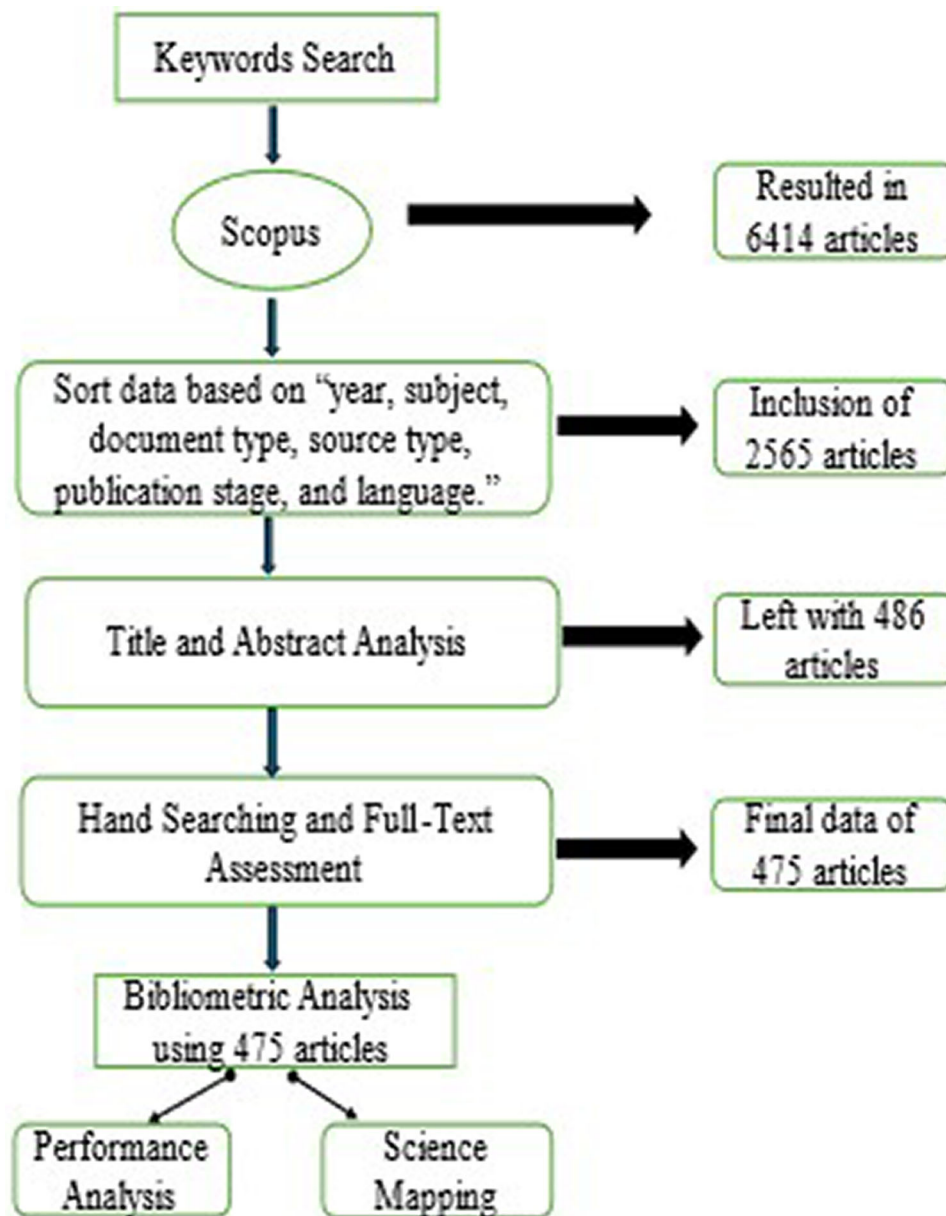


Figure 2. A flow of search and filtration process of articles.

Finally, the data were downloaded and exported to the Excel sheet, and each article was hand searched and read with special emphasis on the abstract, findings, and conclusions, and duplicates were removed which yielded a collection of 475 articles.

3.3. Assessing

This study adopts a bibliometric approach to assess the comprehensive collection of 475 articles on FV. This method utilizes quantitative techniques to analyse scholarly work in real-time (Donthu et al., 2021). Moreover, this study integrates a systematic literature review methodology to enhance transparency and credibility (Ellegaard & Wallin, 2015). Furthermore, bibliometric analysis serves to mitigate bias by employing qualitative reviews through quantitative tools, which are particularly pertinent in handling a large corpus of 100–1000 articles (Burton et al., 2020), as in this review with 475 articles. Performance assessment and science mapping analysis was done by utilizing tools such as Biblioshiny. Performance analysis, the hallmark of any bibliometric studies is mostly descriptive in nature, and it examines the contributions of constitutes to a given domain (Ramos-Rodríguez & Ruíz-Navarro, 2004). Biblioshiny

Table 1. Summary of bibliometric analysis based on Scopus.

Main information about data	
Timespan	1990:2023
Sources (Journals, Books, etc.)	337
Documents	475
Annual Growth Rate %	11.23
Document Average Age	7
Average citations per doc	15.95
Document contents	
Keywords Plus (ID)	1206
Author's Keywords (DE)	1405
Authors	
Authors	1243
Authors of single-authored docs	86
Authors collaboration	
Single-authored docs	88
Co-authors per doc	2.9
International co-authorships %	23.58
Document types	
Article	452
Review	19

Source: Biblioshiny and authors.

incorporates a large variety of analyses such as publication trends, influential articles, notable authors, top countries, and affiliations (Donthu et al., 2021; Moral-Muñoz et al., 2020). The analysis options in biblioshiny are diverse and categorized based on analytics and graphs. The prominent 7 subdivisions are (1) overview, (2) sources, (3) authors, (4) documents, (5) conceptual structures, (6) intellectual structure, and (7) social structure. The results are generated in the form of graphs, and performance analyses can be easily exported to different file formats (Moral-Muñoz et al., 2020). Thus, because of the ease of its interface, Biblioshiny could be superior software for practitioners (Ingale & Paluri, 2022; Thangavel & Chandra, 2023). For data visualization, we used the free and user-friendly software “Vos Viewer.” By synthesizing past literature, this review paves the way for further research in this domain. The subsequent sections of the paper present the findings complemented by tables and figures that elucidate the narratives.

4. Results

Table 1 indicates that, with an annual growth rate of 11.23%, document collection reflects a dynamic accumulation of knowledge over a period of three decades. On average, the articles were seven years old, indicating a relatively recent surge in publications. In terms of citation impact, each document has an average of 15.95 citations, underscoring the significance and popularity of the research domain among scholars. The dataset includes a breadth of topics, as evidenced by the presence of 1206 Keywords Plus (ID) and 1405 author keywords (DE), signifying the richness and diversity of the subject matter covered. A total of 1243 authors contributed to the dataset, with 86 documents authored by a single author. Collaboration in this domain is prevalent, with an average of 2.9 co-authors per document. Approximately 23.58% of the collaborations were international, highlighting the global reach and collaborative work of scholarly research. In terms of document type, the dataset primarily comprises articles (452) and reviews (19), representing rigorous academic study and critical analysis within the scholarly community.

4.1.1. Publication trend (RQ1)

The chronological distribution of scholarly articles over the years revealed a progressive increase in research output. In the initial years, there were a modest number of published articles, gradually transitioning to a paramount growth phase from the late 1990s to the early 2000s. Subsequent years, notably the mid-2000s, exhibited a distinct upward trend in scholarly contributions because of the financial crisis. Notably, an upward trend in article production was evident in the latter half of the 2010s (Figure 3) indicating a profound surge in research activity. This temporal pattern underscores the popularity and escalating engagement within the subject matter due to the aftermath of the global pandemic, and its impact on individuals' overall well-being leads to the dynamic inclination of academics in this field.

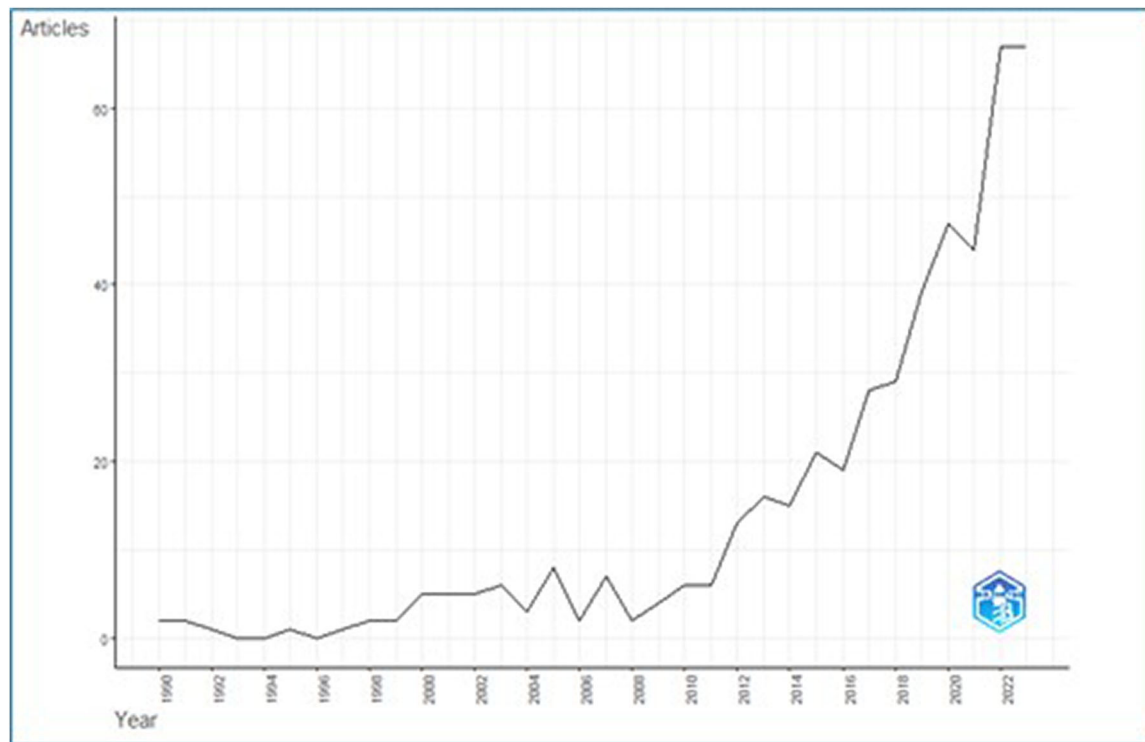


Figure 3. Publication by year of FV research (1990–2023). *Source:* Biblioshiny and authors.

Table 2. Top contributing journals to FV research.

Sources	Scopus ranking	ABDC ranking	Articles
Voluntas	Q1	B	8
Malaysian journal of consumer and family economics	Q3	–	7
Emerging markets finance and trade	Q1	B	6
Journal of banking and finance	Q1	A*	6
Journal of international money and finance	Q1	A	6
Nonprofit and voluntary sector quarterly	Q1	A	6
Nonprofit management and leadership	Q1	B	6
Social indicators research	Q1	A	6
International journal of bank marketing	Q1	A	5
Journal of financial stability	Q1	A	5

Source: Biblioshiny and authors. ABDC rank = as per Australian Business Deans Council 2019 Journal Ranking List.

A* = highest quality showing top 5%–7% journals in the field, A = second highest quality showing the next 15%–25% journals in the field, B = third highest quality showing the next 35%–40% journals in the field, C = fourth highest quality showing the rest of the journals in the field.

4.1.2. Top contributing journals (RQ3)

The distribution of articles across various sources highlights the prominent journals that have contributed significantly to the literature on this subject. Among these, “VOLUNTAS” emerges as a leading source with 8 articles, followed closely by the “Malaysian Journal of Consumer and Family Economics,” which published seven articles. Other significant sources include “Emerging Markets Finance and Trade,” “Journal of Banking and Finance,” “Journal of International Money and Finance,” “Non-profit and Voluntary Sector Quarterly,” “Non-profit Management and Leadership,” and “Social Indicators Research,” each featuring six articles, and “International Journal of Bank Marketing” with five articles. Table 2 suggests that most journals have a Q1 Scopus ranking and A/A* ranking according to the “Australian Business Deans Council” (ABDC), indicating the significance and relevance of the work done in the field of FV. These sources collectively reflect the diverse range of journals contributing to the discourse on the subject, encompassing areas such as economics, finance, consumer behaviour, sustainability, and non-profit management.

4.1.3. The most influencing articles (RQ2)

Global citations indicate the number of citations received without applying filtration (e.g., source) (Baker et al., 2020). Table 3 displays that the articles with the highest number of global citations are “Credit

Table 3. Most cited articles on FV based on global citations.

Article title	Reference	Total citation	Total citation per year
Credit constraints, heterogeneous firms, and international trade	Manova, 2012	517	43.08
Off the cliff and back? Credit conditions and international trade during the global financial crisis	Chor & Manova, 2012	333	25.62
A methodology for measuring the financial vulnerability of charitable non-profit organizations	Tuckman & Chang, 1991	287	8.44
Separate and unequal: Racial segregation and disparities in quality across US nursing homes	Smith et al., 2007	212	11.78
Predicting the financial vulnerability of charitable organizations	Greenlee & Trussel, 2000	169	6.76
Financial vulnerability among arts organizations: A test of the Tuckman-Chang measures	Hager, 2001	152	6.33
Into an age of multiple austerities? Public management and public service bargains across OECD countries	Lodge & Hood, 2011	146	11.23
The funding source, board involvement techniques, and financial vulnerability in non-profit organizations: A test of resource dependence	Hodge & Piccolo, 2005	143	7.15
Assessing systemic risks and predicting systemic events	Duca & Peltonen, 2013	133	16.62
Revisiting the prediction of financial vulnerability	Trussel, 2002	131	5.70

Source: Biblioshiny and authors.

Table 4. Top authors of FV research.

Author	Affiliation	Number of articles	H Index
Sabri, M.F.	Universiti Putra Malaysia	8	21
Rahim, H.A.	Universiti Putra Malaysia	6	4
Arip, M.A.	Universiti Malaysia Sarawak	4	9
Kuek, T.H.	Universiti Malaysia Sarawak	4	2
Garcia-Rodriguez, I.	Universidad Autónoma de Madrid	4	3
Puah C.H.	Universiti Malaysia Sarawak	4	9
Park D.	Asian Development Bank Philippines	4	19
Romero-Merino, M.E.	Universidad de Burgos	4	9
Kim H	Auburn University	3	3

Source: Biblioshiny and authors.

constraints, heterogeneous firms, and international trade,” 2013 (no = 372 citations) and “Off the cliff and back? Credit conditions and international trade during the 2012 global financial crisis (no = 258 citations). These details are prerequisites for researchers to assess the impact and relevance of articles in their respective fields of study.

4.1.4. The most prolific authors (RQ4)

According to the data, 1243 authors, representing 677 affiliations from 63 countries, have contributed articles within the domain of FV. Among these, 84 were published as single-author papers. Specifically, Table 4 provides a snapshot of prominent authors and their affiliations, their associated metrics such as the number of articles published, and the H-index. Among the featured authors, those affiliated with Universiti Putra Malaysia and Universiti Malaysia Sarawak stand out for their substantial contributions, with Sabri, M.F., leading with eight articles and an impressive H-index of 21. Noteworthy contributions also come from international institutions, with authors such as Garcia-Rodriguez, I. from Universidad Autónoma de Madrid, and Park D. from the Asian Development Bank, Philippines, each contributing four articles. Furthermore, authors such as Kim H. from Auburn University made notable contributions despite the lower number of articles, demonstrating the diversity and breadth of expertise represented in the dataset.

4.1.5. Leading country collaborations and affiliation institutes

Figure 4 provides insights into the global distribution of research output on FV, highlighting the contributions of numerous countries to scholarly publications. Additionally, metrics such as SCP (*single country publication*) and MCP (*multiple country publication*) shed light on collaboration patterns and citation

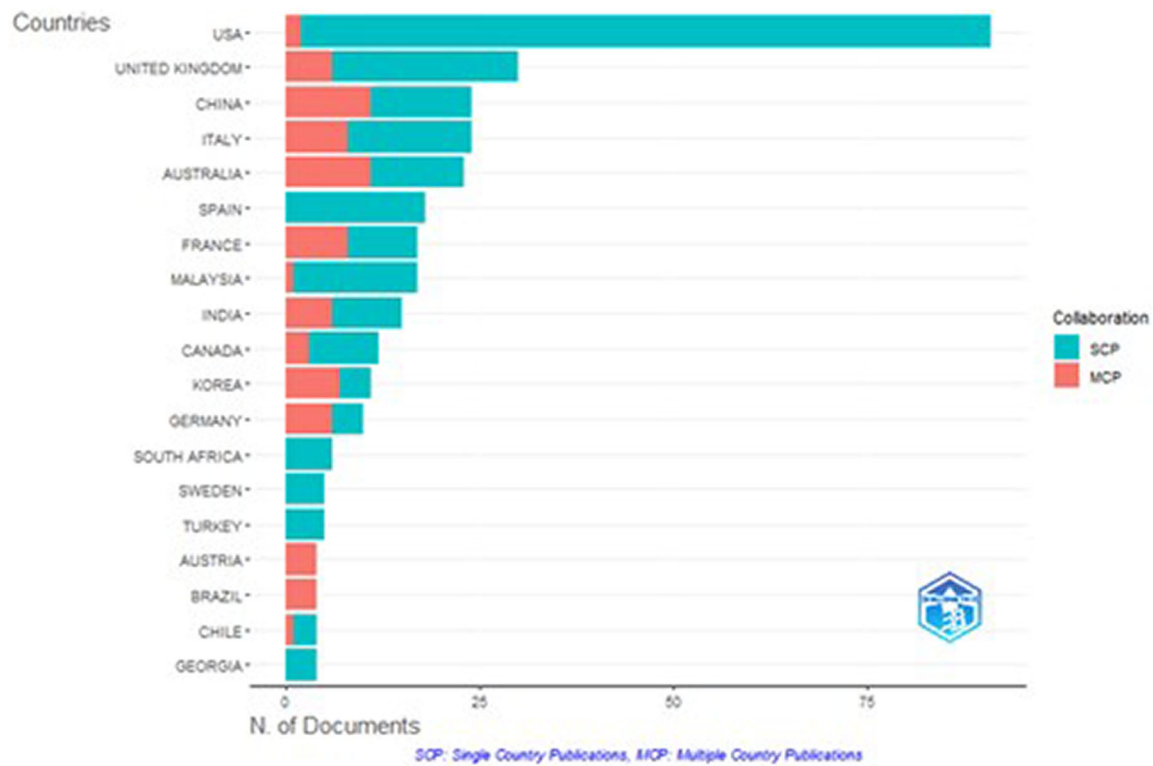


Figure 4. Top affiliations and country to FV research. Source: Biblioshiny and authors.

Country Collaboration Map

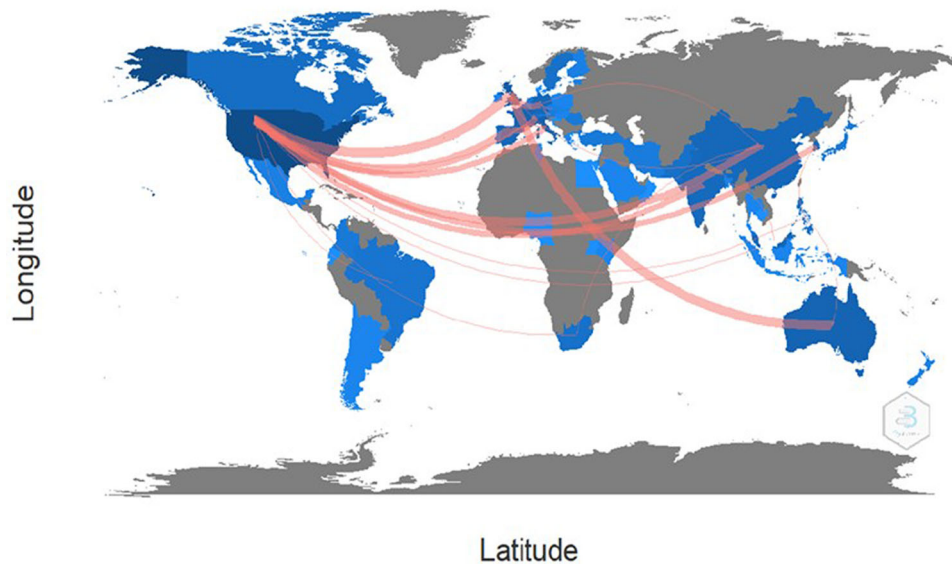


Figure 5. Country collaboration map. Source: Biblioshiny and authors.

behaviour within and across national borders, offering valuable information for researchers and policy-makers interested in understanding the dynamics of research production and collaboration in this field. It is evident that the research in this domain is concentrated in developed countries, showing a future gap in research in developing and under-developing countries.

Figure 5 illustrates the network of country collaboration within the realm of FV research, delineating countries according to their productivity level. High-productivity nations such as the United States,

China, Malaysia, and Australia are depicted in dark blue because of well-established research infrastructure and government support in terms of funding, whereas those with fewer publications, including Israel, Romania, and the Philippines, are represented in light blue. The red lines signify the strength and frequency of collaboration between different countries, with thicker lines indicating more frequent collaborations. Notably, the United States has emerged as the central node in international collaboration, engaging with partners such as China, India, Australia, and various European countries. Additionally, the prominent red line connecting European countries and Australia underscores the frequency of collaboration in their research endeavours.

4.2. Science mapping

Science mapping analysis, as outlined by Donthu et al. (2021), is a comprehensive examination that reveals the accumulated knowledge within a specific research area through graphical representation. It examines the relationships between various research elements of the domain (Baker et al., 2020). This analysis encompasses thematic, factorial, temporal, and network analyses to depict the existing body of knowledge effectively.

4.2.1. Thematic analysis (RQ5)

Thematic mapping in bibliometric analysis refers to the process of visually representing thematic structures and interrelationships among documents, authors, keywords, and other elements within scholarly literature. Thematic mapping techniques aim to uncover the underlying themes, patterns, and trends in literature, providing researchers with insights into the intellectual landscape of a particular field.

Generally, co-word analysis is used for thematic mapping, which requires the identification of frequently co-occurring terms or keywords within an article and the construction of networks or clusters based on these associations. By analysing the co-occurrence patterns of keywords, researchers can identify clusters of related topics and visualize them using techniques such as network visualization or cluster analysis. Articles belonging to the same cluster share a common theme and vary from those in other clusters. Thematic analysis of the co-citation network can be allowed by clustering (Xu et al., 2018). Clustering predominantly helps to create a thematic map (Donthu et al., 2021). The detected themes were further visualized using two different tools: a strategic diagram and a thematic network. Each theme can be indicated using two measures: centrality and density. Centrality measures “the degree of interaction of a network with other networks.” Density measures “the internal strength of the network” (Cobo et al., 2018).

Figure 6 presents a thematic map depicting the multiple research streams in FV literature. The map categorizes major themes into four quadrants within a two-dimensional graph, with the x-axis representing density and the y-axis representing centrality. Themes in the upper-left quadrant indicate specialized or niche topics. Although these themes exhibited strong internal ties, they lacked significant external connections. For instance, themes like “socioeconomic” and “India” reflect research primarily focused on

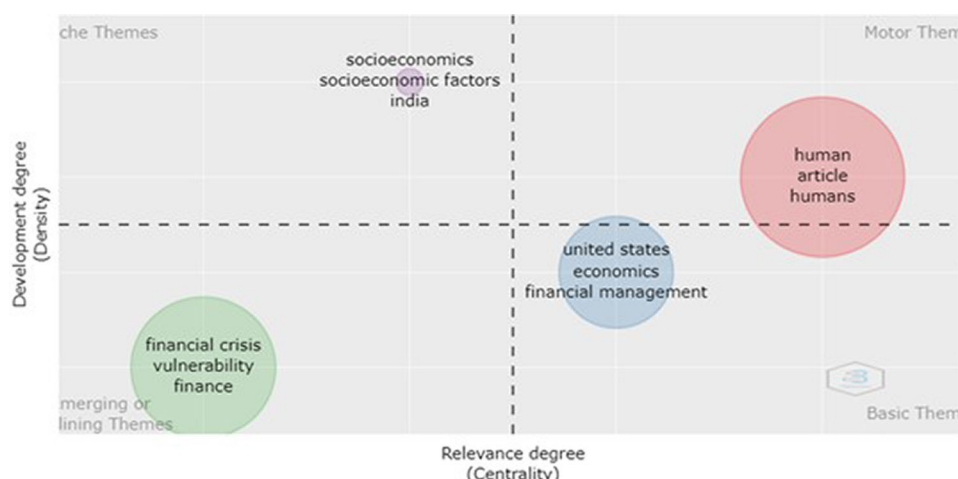


Figure 6. Thematic map of research streams in FV. *Source:* Biblioshiny and authors.

socioeconomic factors within the Indian context (Singh & Malik, 2022; Sachin et al., 2018). Themes positioned in the upper-right quadrant represent motor themes characterized by well-developed and significant research fields. These themes, such as “Humans,” (Baker et al., 2005; Kim et al., 2016), prominently feature research centered on individuals and households. Emerging or disappearing themes were identified in the lower-left quadrant. These themes are in the early stages of development and may demonstrate either promising or declining trends. Examples include “financial crisis” and “vulnerability,” (Fernandes & Ferreira, 2017) which capture recent phenomena such as the aftermath of Covid-19 (Kalil et al., 2020) and its impact on individuals and nations. Themes situated in the lower-right quadrant are deemed basic themes that are significant for the research field but are less developed. This quadrant encompasses transversal and fundamental themes such as “United States,” “economies,” and “financial management,” with a notable focus on research conducted within the US context (Lachs & Han, 2015; Rotter et al., 2019; Salignac et al., 2019).

Overall, the thematic map provides an intuitive framework for analyzing the placement of themes within different quadrants, aiding in the interpretation of their significance and developmental stage within the FV literature (Cobo et al., 2018; Esfahani et al., 2019).

4.3. Network analysis

4.3.1. Clustering

The popularity of articles can be measured by the number of citations they have received, but the prominence of articles is measured by page rank analysis, which indicates the number of times a particular article is quoted by a highly cited article (Ding & Cronin, 2011). Highly cited articles cannot be considered the most prestigious. Reporting PageRank is very important in bibliometric analysis as it ascertains the quality of a paper. PageRank was introduced by Brin and Page (2012) and used to arrange webpages based on Google searches. In bibliometric analysis, PageRank can be used to measure the linkage between citation networks and create clusters that show the themes in a research domain, thus providing a dual benefit (Goyal & Kumar, 2020; Yan & Ding, 2011). The “clusters” enumerates the diverse concepts and topics encapsulated within the area and shed light on the breadth and scope of FV research. It suggests a spectrum of themes ranging from macroeconomic indicators such as “finance” and “economic growth” to social determinants such as “household income,” “Covid 19” and “poverty.” Furthermore, other clusters delve into specific countries where the major research has been done and subject area, as evidenced by cluster such as “socioeconomics” and “cross-sectional study,” underscoring the multi-disciplinary nature of research in this domain. Each designated “Cluster,” exhibits a specific thematic grouping and facilitating in nuanced understanding of the interrelatedness among different concepts within this research landscape. Clusters serve as organizational frameworks, grouping nodes that share commonalities in terms of subject matter or analytical approaches.

According to the PageRank analysis, there are four major co-citation clusters: human ($n = 224$), financial crisis ($n = 93$), United States ($n = 79$), and socioeconomic ($n = 48$). Table 5 and Figure 7 show the top

Table 5. The lead papers of each cluster: co-citation PageRank measure.

Cluster 1 (Humans, individuals)	Cluster 2 (Financial crisis)	Cluster 3 (United States, economics and management)	Cluster 4 (Socioeconomics, developing countries, India)
Lee and Sabri (2017) Rodrigo (2016). Paxton et al. (2013) Peretti-Watel et al. (2016) Gathergood (2012) Anderloni et al. (2012) Bialowolski and Weziak-Bialowolska (2014). O'Connor et al. (2019) Abdullah Yusof et al. (2015) Hoffmann and McNair (2018)	Tuckman and Chang (1991) Manova (2012) Chor and Manova (2012) Lodge and Hood (2011) Hodge and Piccolo (2005) Hager (2001) Lambrecht (2001) Bowman (2011) Gutter and Saleem (2005)	Despard et al. (2017) Fernandes and Ferreira (2017) Salignac et al. (2019) Lachs and Han (2015) Rotter et al. (2019) Baker et al. (2005) Borgy et al. (2014) Smith et al. (2007) Emmons and Noeth (2013)	Cho and Hahm (2014) Park et al. (2022) Dufrénot et al. (2016) Daud et al. (2018) Hahm et al. (2013) Zhang and Kang (2016) Al-Mamun and Mazumder (2015) Ali et al. (2020) Kuek et al. (2020) Sachin et al. (2018) Magli et al. (2020)

Source: Biblioshiny and authors.

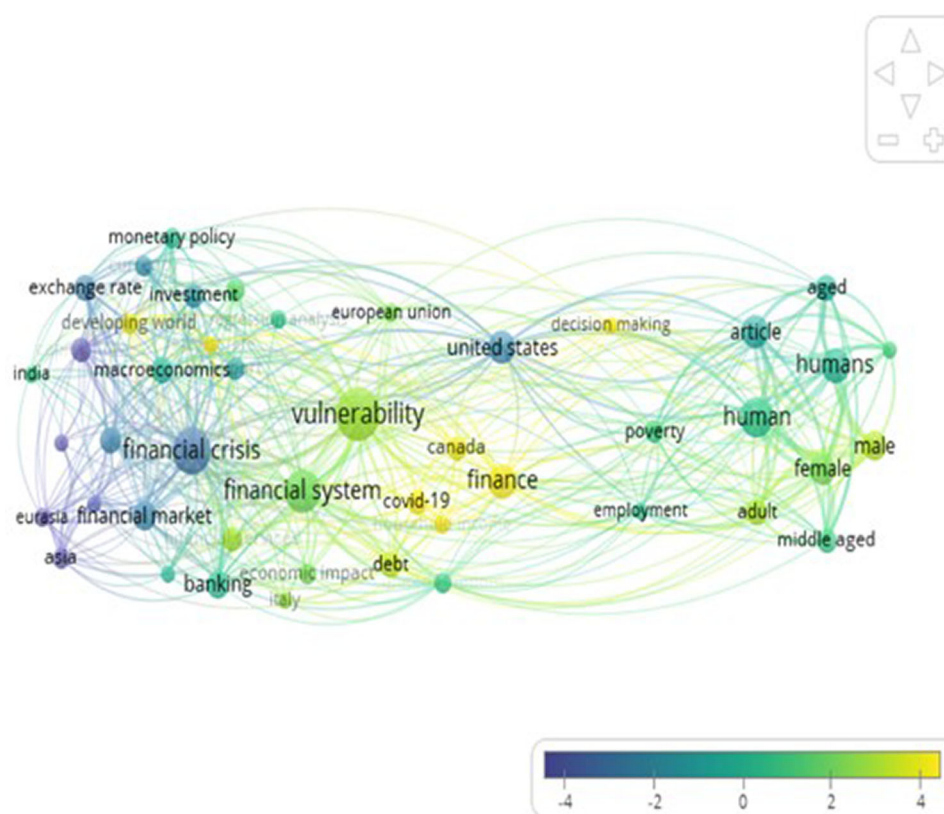


Figure 7. Clusters based on co-citation analysis in FV. Source: Vos viewer and authors.

prestigious papers in each cluster. Cluster 1, which includes the themes of FV and humanity, is the largest cluster ($n = 224$). Lee and Sabri (2017) article “Review of financial vulnerability studies” received the highest score for PageRank ($PR = 0.059863$). This study received the most citations from highly cited articles.

Thematic mapping and clustering in bibliometric analysis enables scholars to gain a comprehensive and deeper understanding of the intellectual structure and evolution of a research field, identify emerging trends or research gaps, and explore interdisciplinary connections between varied topics or disciplines. By visualizing thematic clusters and their interrelationships, researchers can generate new insights, formulate research directions, and make strategic decisions on research and innovation.

4.3.2. Keyword analysis

The Keyword analysis performed on 475 articles by biblioshiny revealed related topics and themes in FV research. The intellectual structure of the domain can be explained using keyword co-occurrence analysis (Ding et al., 2001). A total of 1405 authors’ keywords were identified from 475 articles. The top ten most relevant keywords are presented in the graph, and Figure 8 enumerates the frequency of keywords in the literature pertaining to FV, offering insights into prevalent research themes. Keywords such as “human,” “household debt,” “female,” and “poverty” underscore the interdisciplinary nature of studies, while terms such as “vulnerability,” “financial stability,” and “financial crisis” reflect core thematic concerns. Additionally, demographic descriptors like “middle aged” and “adolescent” highlight nuanced examinations of vulnerability across different age groups. Recent topics such as “Covid-19” and “financial crises” signify a focus on contemporary global challenges. This comprehensive keyword analysis provides a snapshot of research priorities and trends in the field of FV.

Figure 9 shows a word cloud representing authors’ keywords, indicating prevalent terms utilized over time, as revealed by the Loess analysis (Ding et al., 2001). The visualization illustrates the interconnections among primary keywords, with prominent focus on “financial stability” and “Vulnerability” Additionally, key themes encompass “financial crisis,” “financial literacy” “emerging market” and “household debt” aligning with major research findings highlighted by multiple correspondence analysis.



Figure 8. Most relevant keywords. *Source:* Biblioshiny using Scopus database.



Figure 9. Word cloud of authors' keywords. *Source:* Biblioshiny using Scopus database.

4.3.3. Structure map developed from the multiple correspondence analysis (MCA)

Bibliometric analysis is not only an analysis of keywords but also the terms used in the article's titles and abstracts. Correspondence analysis (CA) and multiple correspondence analysis (MCA) present visualizations of the conceptual structure of a two-dimensional plot (Aria & Cuccurullo, 2017). Here, MCA is used to deduce the conceptual structure of the domain to discover clusters of articles that integrate common concepts, and the results are plotted on a two-dimensional map (Aria & Cuccurullo, 2017).

The conceptual structure map is constructed based on multiple correspondence analysis (MCA), which brings together the keywords by considering their homogeneity in the network. Figure 10 shows common keywords grouped into two clusters. Cluster 1 to the right of the conceptual structure map

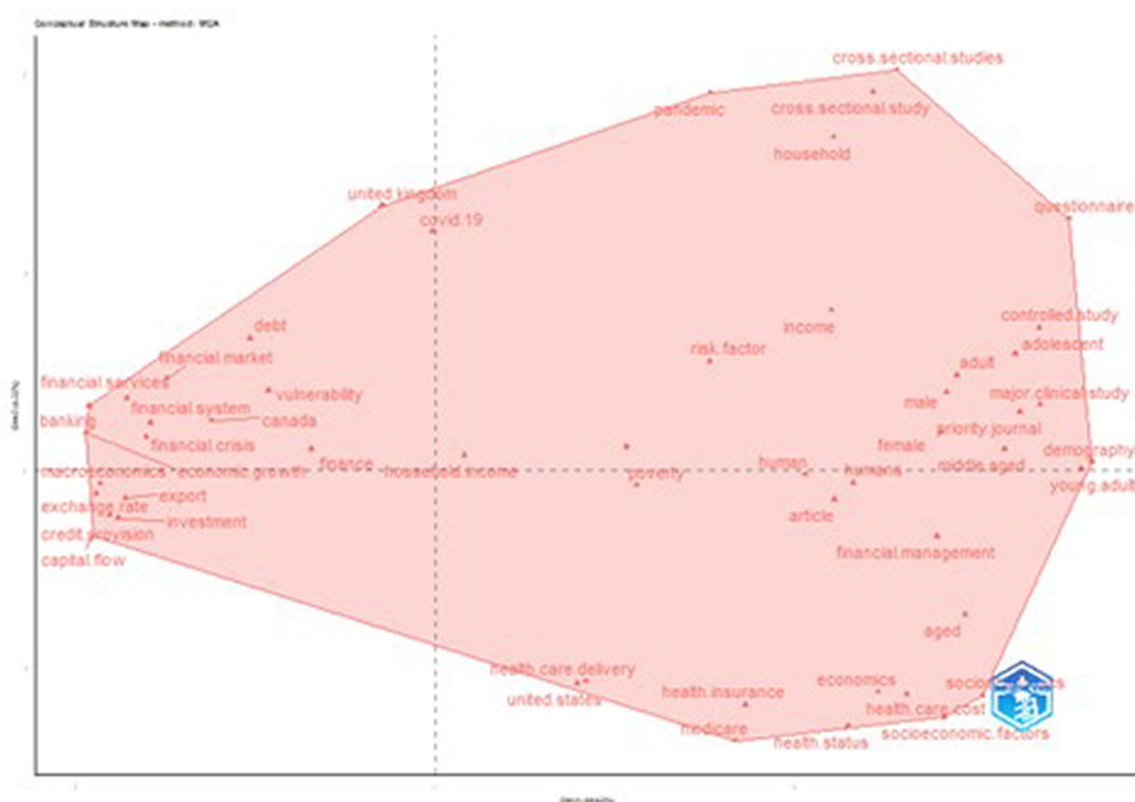


Figure 10. Conceptual structure map – method MCA. *Source:* Biblioshiny using Scopus database.

represents the keywords that are most frequently used in the research articles of FV, with research themes of health and management in common. For example, keywords such as “Humans,” “Macro-economic,” “Psychology,” “Organizations,” “Finance,” and “The U.S. Whereas cluster 2 to the left of the conceptual structure map shows the keywords “Finance,” “financial systems,” “banking,” “investment,” “financial crisis” and “Canada.” These keywords reveal that very limited work has been done and there is further scope for exploring the FV area. The closeness of the keywords towards the centre in both clusters can be identified as a high research theme in recent years; the closer the keywords are to the edge of the clusters, the narrower is the research coverage (Aria & Cuccurullo, 2017).

4.3.4. Future direction as the way forward (RQ6)

Through a comprehensive review of existing literature and the application of thematic and keyword analyses, this study presents significant findings that generate promising avenues for future research. The proposed directions for further investigation emphasize four key areas: (a) definition and scope, (b) antecedents and consequences of FV, (c) methodological perspective, and (d) interdisciplinary studies. Thus, the findings of this study not only contribute to the current understanding of FV, but also guide and inspire future scholarly studies within this field.

4.3.4.1. Definition and scope of FV. The first research direction stems from the literature review and pertains directly to the definition and scope of the FV construct. A critical evaluation of the current body of work reveals a lack of consensus regarding the precise boundaries of FV, thereby raising concerns about its definition and scope (O'Connor et al., 2019). Although the term “FV” is widely used among academics and practitioners, there has been limited discussion on its conceptual clarity within the realm of personal and household finance. Terms like “financial crisis,” “financial fragility,” and “financial distress” are often used interchangeably with FV (Ali et al., 2020; Daud et al., 2018), which further complicates its conceptualization. Figure 5 highlights emerging themes (represented in green

colour) that include terms such as “financial crisis” and “vulnerability” and illustrates this ambiguity in usage. This finding underscores the need for a homogeneous and comprehensive definition of FV.

Additionally, it is unlikely that a same concept of FV can be uniformly applied across economically diverse regions, such as the USA, Africa, India, and Malaysia (Fernández-López et al., 2023). As such, it is essential to develop context-specific definitions of FV that are adaptable to varying economic conditions. Importantly, our findings also indicate that the majority of existing literature predominantly focuses on economically developed countries, often overlooking regions with higher poverty rates or less-developed economies. Given the scarcity of research from developing nations, future studies should prioritize these contexts.

4.3.4.2. Antecedent and consequences of FV. The second core research direction offers valuable insights into potential antecedents and outcomes within the domain of FV and enhances our understanding necessary for conducting empirical investigations in this domain. Existing research has primarily focused on identifying the factors that determine the FV of individuals and households. These factors are largely driven by the growing consensus among scholars that the pandemic has caused a significant decline in income levels (Midões & Seré, 2022). Indeed, the global financial crisis has heightened the vulnerability of individuals and household and contributes to issues such as rising unemployment, difficulties in servicing debt, and financial emergencies (Van Aardt et al., 2009). Keyword analysis (Figure 7) also revealed similar terms such as “household debt,” “human,” “Covid-19,” and “poverty.” In fact, much of the extant research has narrowly relied on objective measures such as income and debt ratios, credit history, and income statements to assess FV (Anderloni et al., 2012; Noerhidajati et al., 2021), alongside subjective measures such as individuals’ perceptions of their financial circumstances (Haushofer & Fehr, 2014; Mani et al., 2013). This highlights the need for future studies to incorporate a broader range of factors in understanding FV.

In Figure 5, the niche themes (presented in purple colour) exhibit a research gap in categorizing the determinants of FV, particularly in distinguishing between sociodemographic, behavioral, macroeconomic, and social factors. Incorporating more behavioral variables, such as self-control, locus of control (Heidhues & Kőszegi, 2010), and financial capability, is crucial for developing a more comprehensive understanding of FV. Also, in general, while a vast body of literature has examined the antecedents of FV, much less is known about its consequences. Previous studies that have explored potential outcomes of FV have documented its effects on broader constructs, such as family dynamics, well-being, quality of life, mental health, and overall individual well-being (Hoffmann & McNair, 2018; Sullivan & Meschede, 2016). This review opens up future avenues to explore the consequences of FV in greater depth, which could offer valuable insights for both academic research and policy initiatives aimed at addressing FV.

4.3.4.3. Methodological perspective. The third research directions come from the methodological perspective, as this review is based on the articles extracted from the Scopus database. Employing other databases for the extraction of data could provide a comprehensive view in future studies. The keyword search could be enhanced by incorporating additional keywords so that more relevant publications in this field are included in the study. Furthermore, future researchers could include an automatic process that searches articles as per meta-keywords and co-occurrences of keywords from literature databases. Additionally, we envisage the use of diversified approaches, including both quantitative and qualitative or mixed methods, as this may attempt to provide a subtle nuance and understanding its impact over the various stages of life (Baker et al., 2005).

4.3.4.4. Interdisciplinary studies. The final research direction underscores the need for increased interdisciplinary research, particularly in the broad domains such financial management, economics, and sociology (see Figure 5, displayed in blue colour). This review identifies a promising direction for future exploration through interdisciplinary studies, such as those focusing on fintech, financial inclusion, sustainability, technology adoption, and related factors. Moreover, further studies should prioritize assessing the effectiveness of financial education and literacy programs in reducing FV, as well as exploring innovative and tailored approaches for financially vulnerable individuals (Burlamaqui & Kregel, 2005).

A notable gap exists in understanding the growing influence of digital financial services on FV, especially for vulnerable populations (Mogaji, 2020). Addressing this gap through future research could offer critical insights into the multifaceted nature of FV. This review raises several important questions that warrant further investigation: (1) How should household FV be conceptualized to better capture its dimensionality and strategic implications? (2) How do different contexts – such as family environment, gender, societal factors, and emerging technologies – affect an individual's experience of FV, and how do individuals respond to these influences? (3) What insights can financial and behavioral theories offer on overcoming and mitigating the impact of FV on individuals and households? (4) Are government interventions equally effective in mitigating FV across different population cohorts globally? (5) What roles do fintech and digitalization play in shaping the FV of individuals?

Answering these questions will provide a more comprehensive understanding of the field and chart a clear path forward for future research. Such studies will not only synthesize existing knowledge but also identify key gaps that can serve as the foundation for further investigation in this critical area.

5. Discussion and conclusion

The aftermath of Covid-19 pandemic has led to global financial crisis, aggravating financial vulnerability (FV) across varied demographic groups. The pandemic has validated that even high-income individuals are not immune to financial hardship and vulnerability. This shift underscores the need to deepen our understanding of FV for developing strategies to overcome these challenges. Consequently, research on FV has experienced unprecedented growth in recent times, driven by its undisputable importance for individuals and institutions in the global economic landscape. This increase in the number of empirical investigations in the domain of FV has been effectively summarized by recent research syntheses focusing on salient consumer behaviour and decision-making activities (e.g., Fernández-López et al., 2023; Leandro & Botelho, 2022; Lee & Sabri, 2017). Unlike previous reviews, our study extends the analysis over an extensive timeline (1990–2023), capturing the evolution of this domain over three decades, emphasizing its criticality in comprehending constructs at the individual, household, and organizational levels, and thus providing a comprehensive historical perspective. Also, our review incorporates a wider array of factors associated to FV, including socio-economic, financial, psychological and contemporary situations. This holistic approach allows a nuanced understanding of the multifaceted nature of FV. This comprehensive and bibliometric science driven approach not only enhances the understanding of FV but also direct the pathways for future research and practical implications in a wider range, thus making a significant contribution to the field of finance and economic.

By systematically examining a diverse range of studies, we offer a comprehensive overview of key themes, research trajectories, and areas of interest among scholars. It is evident from trend analysis that there is a dearth of academic output in this field. The publication trend (**Answer to RQ1**) revealed a steady boost in publications over a period, particularly after the 2008 financial crisis, indicating increased scholarly interest. One of the fundamental outcomes of this analysis is the identification of core themes of this literature (**Answer to RQ5**), such as “vulnerability,” “poverty,” “financial crisis,” “socioeconomic factors” and “indebtedness” and it underscores the universal concern surrounding economic instability and social welfare, specially post pandemic. Moreover, the collaborative effort and the interdisciplinary research is evident from the diversity of the keywords identified such as “human,” “female,” “macro-economic,” “financial literacy” and “healthcare cost” suggesting a holistic approach that integrates understanding from diverse fields. This interdisciplinary perspective enriches our understanding of FV by considering broader social, demographic, and health-related factors that influence individuals' overall well-being and life. For example, the most cited articles (**Answer to RQ 2&4**) on FV are “Credit constraints, heterogeneous firms, and international trade” (Manova, 2012) with 372 citations followed by “Off the cliff and back? Credit conditions and international trade during the global financial crisis” (Chor & Manova, 2012) with 258 citations. We found that “Voluntas” and “Journal of Banking and Finance” are the major sources (**Answer to RQ3**) for the related work. The prevalence of keywords like “covid-19,” “financial crisis,” “low income” and “pandemic” reflects the contemporary relevance of understanding the impact of global health crises on financial resilience. This emphasizes the responsiveness of scholars in incorporating the current scenario and underscores the need for adaptive strategies to address emerging

challenges in FV research (**Answer to RQ6**). Furthermore, the study underscores inclusive strategies and assists policymakers and practitioners in effective interventions and programs to mitigate FV and promote economic stability.

6.1. Theoretical implications

Based on extensive literature review and bibliometric analysis in the domain of FV, various theoretical implications emerge that can enrich our understanding and perspective of this domain. As per the traditional microeconomic approach (Life-cycle Hypothesis) to financial behaviour and decision-making, a perfectly rational and conscious individual will spend less than their income during his high-earning phase of life, thereby save for smooth consumption in reduced income periods (Anderloni et al., 2012; Ando & Modigliani, 1963; Modigliani & Brumberg, 1954). However, past literature suggests that many individuals fail to pursue this optimal saving behaviour, resulting in increased FV. Factors such as lack of financial literacy (Worthington, 2013), credit and debt burden (Bridges & Disney, 2004), unexpected life events (Lusardi et al., 2019), and self-control (Gathergood, 2012) can disrupt the saving pattern, leaving them financially vulnerable when their income decreases. Moreover, Martín-Legendre and Sánchez-Santos (2024) used the permanent income theory to explain the relation between household debt and FV of the Spanish population. The permanent income theory posits that “the individuals’ consumption is not only determined by their present income level, which is transitory, but by their expected income over their lifetime, which is permanent, so that borrowing and spending will ultimately depend on this permanent income estimated by the individuals themselves” (Friedman, 1957). Past literature from behavioural economics sheds light on psychological attributes and incorporated the concept of cognitive biases to explain financial stress (e.g., Baker et al., 2005; Brown & Taylor, 2014). These psychological factors then influence individuals’ financial choices in a crisis situation leads to FV (Hoffmann & McNair, 2018; Mani et al., 2013). Extant literature endorses the role family socialization on financial behaviour and financial resilience (Danes & Yang, 2014). Yet, less attention has been paid to the theoretical framework to explain the antecedents and consequences of FV (Fernández-López et al., 2023; O’Connor et al., 2019). There are several demographic factors and psychological biases such as risk tolerance, attitude towards money, present/future orientation, overconfidence, etc., that can assist future researcher in developing strategies to enhance financial resilience and mitigate vulnerability.

6.2. Practical and managerial implications

According to Mukherjee et al. (2022) bibliometric outcomes can be applied to these broad practical purposes: first, in determining the reach for coverage claims of this domain. Second, it identifies social dominance or hidden biases in improvement efforts. Third, anomalies should be identified for further examination. Fourth, we evaluated the relative performance of impartial decision-making. The study’s insights can be leveraged by managers and policymakers to develop impeccable and effective interventions and strategies to diminish the impact of FV on individuals and households. Lastly, the study findings help financial institutions to enhance their understanding of the factors contributing to FV, and they could include study insights for designing targeted financial education programs or products for vulnerable populations.

7. Limitation of the study

Nevertheless, this bibliometric review depicts a snapshot of research publications across the world on FV, and a sincere effort has been made to execute the bibliometric analysis in the best possible way; however, the review has certain limitations. First, the results obtained from the review cannot be generalized, as they encompass research documents only from the Scopus database. Therefore, the Scopus database does not ensure the inclusion of all relevant documents and the highest quality standards. Second, the analysis was conducted using biblioshiny as the analytical tool. Therefore, the results obtained should be interpreted with caution in terms of accuracy.

Authors' contributions

Conception and design of the work: Anju Gupta, Dr. Shekhar Mishra, and Dr. Deepak Behera. **Data Collection:** Anju Gupta. **Contributed analysis tool:** Anju Gupta, and Dr. Shekhar Mishra. **Performed the analysis:** Anju Gupta and Dr. Shekhar Mishra. **Drafted the paper:** Anju Gupta. **Reviewing the article for final approval:** Anju Gupta, Dr. Shekhar Mishra, and Dr. Deepak Behera.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Note

1. A technology solutions provider for banks and merchants in India.

About the authors

Anju Gupta, a senior research scholar at the Department of Commerce, Manipal Academy of Higher Education in Manipal. Her research focuses on Behavioral Finance and Economics, with her current research directed towards Entrepreneurship, Behavioral Finance, Digital Financial Literacy, Financial Well-being and Vulnerability.

Shekhar Mishra (Corresponding Author) is presently serving as Senior Assistant Professor in area of Finance at the Department of Commerce, Manipal Academy of Higher Education, Manipal, Karnataka, India. His research interests are in the area of econometrics and financial economics. He has published research articles in various journals of national and international repute.

Deepak Kumar Behera is currently working as Lecturer in Economics & Finance department, The Business School, RMIT Vietnam. His research interests include macroeconomics, public finance and policy; global economic issues, development economics; health economics and policy; research methodology, and applied econometrics. He has published research articles in various journals of national and international repute.

ORCID

Anju Gupta  <http://orcid.org/0000-0002-7143-1022>

Shekhar Mishra  <http://orcid.org/0000-0002-7382-1008>

Deepak Kumar Behera  <http://orcid.org/0000-0001-6539-4280>

Data availability statement

The data will be available upon request through an email to the corresponding author.

References

- Abdullah Yusof, S., Abd Rokis, R., & Wan Jusoh, W. J. (2015). Financial fragility of urban households in Malaysia. *Jurnal Ekonomi Malaysia*, 49(1), 15–24. <https://doi.org/10.17576/JEM-2015-4901-02>
- Ali, L., Khan, M. K. N., & Ahmad, H. (2020). Financial fragility of Pakistani household. *Journal of Family and Economic Issues*, 41(3), 572–590. <https://doi.org/10.1007/s10834-020-09683-y>
- Al-Mamun, A., & Mazumder, M. N. H. (2015). Impact of microcredit on income, poverty, and economic vulnerability in Peninsular Malaysia. *Development in Practice*, 25(3), 333–346. <https://doi.org/10.1080/09614524.2015.1019339>
- Altman, E. I. (1968). Financial ratios, discriminant analysis, and the prediction of corporate bankruptcy. *The Journal of Finance*, 23(4), 589–609. <https://doi.org/10.1111/j.1540-6261.1968.tb00843.x>
- Anderloni, L., Bacchiocchi, E., & Vandone, D. (2012). Household financial vulnerability: An empirical analysis. *Research in Economics*, 66(3), 284–296. <https://doi.org/10.1016/j.rie.2012.03.001>
- Ando, A., & Modigliani, F. (1963). The “life cycle” hypothesis of saving: aggregate implications and rests. *American Economic Review*, 53(1), 55–84.
- Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Baker, H. K., Pandey, N., Kumar, S., & Haldar, A. (2020). A bibliometric analysis of board diversity: Current status, development, and future research directions. *Journal of Business Research*, 108, 232–246. <https://doi.org/10.1016/j.jbusres.2019.11.025>

- Baker, S. M., Gentry, J. W., & Rittenburg, T. L. (2005). Building understanding of the domain of consumer vulnerability. *Journal of Macromarketing*, 25(2), 128–139. <https://doi.org/10.1177/0276146705280622>
- Bialowolski, P., & Weziak-Bialowolska, D. (2014). The index of household financial condition, combining subjective and objective indicators: An appraisal of Italian households. *Social Indicators Research*, 118(1), 365–385. <https://doi.org/10.1007/s11205-013-0401-0>
- Blanco-Mesa, F., Merigó, J. M., & Gil-Lafuente, A. M. (2017). Fuzzy decision making: A bibliometric-based review. *Journal of Intelligent & Fuzzy Systems*, 32(3), 2033–2050. <https://doi.org/10.3233/JIFS-161640>
- Borgy, V., Bouthevillain, C., & Dufrénot, G. (2014). Global imbalances and financial sector instabilities: Introduction. *International Journal of Finance & Economics*, 19(1), 1–2. <https://doi.org/10.1002/ijfe.1480>
- Bowman, W. (2011). Financial capacity and sustainability of ordinary nonprofits. *Nonprofit Management and Leadership*, 22(1), 37–51. <https://doi.org/10.1002/nml.20039>
- Bridges, S., & Disney, R. (2004). Use of credit and arrears on debt among low-income families in the United Kingdom. *Fiscal Studies*, 25(1), 1–25. <https://doi.org/10.1111/j.1475-5890.2004.tb00094.x>
- Brin, S., & Page, L. (2012). The anatomy of a large-scale hypertextual web search engine. *Computer Networks*, 56(18), 3825–3833. <https://doi.org/10.1016/j.comnet.2012.10.007>
- Brown, S., & Taylor, K. (2014). Household finances and the 'Big Five' personality traits. *Journal of Economic Psychology*, 45, 197–212. <https://doi.org/10.1016/j.joep.2014.10.006>
- Brunetti, M., Giarda, E., & Torricelli, C. (2016). Is financial fragility a matter of illiquidity? An appraisal for Italian households. *Review of Income and Wealth*, 62(4), 628–649. <https://doi.org/10.1111/roiw.12189>
- Burlamaqui, L., & Kregel, J. (2005). Innovation, competition and financial vulnerability in economic development. *Revista de Economia Política*, 25(2), 5–22. <https://doi.org/10.1590/S0101-31572005000200002>
- Burton, B., Kumar, S., & Pandey, N. (2020). Twenty-five years of The European Journal of Finance (EJF): A retrospective analysis. *The European Journal of Finance*, 26(18), 1817–1841. <https://doi.org/10.1080/1351847X.2020.1754873>
- Chapman, K., & Ellinger, A. E. (2019). An evaluation of Web of Science, Scopus and Google Scholar citations in operations management. *The International Journal of Logistics Management*, 30(4), 1039–1053. <https://doi.org/10.1108/IJLM-04-2019-0110>
- Cho, S., & Hahm, J.-H. (2014). Foreign currency noncore bank liabilities and macroprudential levy in Korea. *Emerging Markets Finance and Trade*, 50(6), 5–18. <https://doi.org/10.1080/1540496X.2014.1013871>
- Chor, D., & Manova, K. (2012). Off the cliff and back? Credit conditions and international trade during the global financial crisis. *Journal of International Economics*, 87(1), 117–133. <https://doi.org/10.1016/j.jinteco.2011.04.001>
- Cobo, M. J., Jürgens, B., Herrero-Solana, V., Martínez, M. A., & Herrera-Viedma, E. (2018). Industry 4.0: A perspective based on bibliometric analysis. *Procedia Computer Science*, 139, 364–371. <https://doi.org/10.1016/j.procs.2018.10.278>
- Costa, S., & Farinha, L. (2012). *Households' indebtedness: A microeconomic analysis based on the results of the households' financial and consumption survey* (pp. 133–157). Financial stability report. banco de portugal.
- Danes, S. M., & Yang, Y. (2014). Assessment of the use of theories within the Journal of Financial Counselling and Planning and the contribution of the family financial socialization conceptual model. *Journal of Financial Counselling and Planning*, 25(1), 53–68.
- Daud, S. N. M., Marzuki, A., Ahmad, N., & Kefeli, Z. (2018). Financial vulnerability and its determinants: Survey evidence from Malaysian households. *Emerging Markets Finance and Trade*, 55(9), 1991–2003. <https://doi.org/10.1080/1540496X.2018.1511421>
- Despard, M. R., Nafziger-Mayegun, R. N., Adjabeng, B. K., & Ansong, D. (2017). Does revenue diversification predict financial vulnerability among non-governmental organizations in sub-Saharan Africa? *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 28(5), 2124–2144. <https://doi.org/10.1007/s11266-017-9835-3>
- Ding, Y., & Cronin, B. (2011). Popular and/or prestigious? Measures of scholarly esteem. *Information Processing & Management*, 47(1), 80–96. <https://doi.org/10.1016/j.ipm.2010.01.002>
- Ding, Y., Chowdhury, G. G., & Foo, S. (2001). Bibliometric cartography of information retrieval research by using co-word analysis. *Information Processing & Management*, 37(6), 817–842. [https://doi.org/10.1016/S0306-4573\(00\)00051-0](https://doi.org/10.1016/S0306-4573(00)00051-0)
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133(133), 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Duca, M. L., & Peltonen, T. A. (2013). Assessing systemic risks and predicting systemic events. *Journal of Banking & Finance*, 37(7), 2183–2195. <https://doi.org/10.1016/j.jbankfin.2012.06.010>
- Dufrénot, G., Gente, K., & Monsia, F. (2016). Macroeconomic imbalances, financial stress and fiscal vulnerability in the euro area before the debt crises: A market view. *Journal of International Money and Finance*, 67, 123–146. <https://doi.org/10.1016/j.jimonfin.2016.04.002>
- Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, 105(3), 1809–1831. <https://doi.org/10.1007/s11192-015-1645-z>
- Emmons, W. R., & Noeth, B. J. (2013). Economic vulnerability and financial fragility. *Review*, 95(5), 361–388. <https://doi.org/10.20955/r.95.361-388>
- Esfahani, H., Tavasoli, K., & Jabbarzadeh, A. (2019). Big data and social media: A scientometrics analysis. *International Journal of Data and Network Science*, 3(3), 145–164. <https://doi.org/10.5267/j.ijdns.2019.2.007>

- Fernandes, A. P., & Ferreira, P. (2017). Financing constraints and fixed-term employment: Evidence from the 2008-09 financial crisis. *European Economic Review*, 92, 215–238. <https://doi.org/10.1016/j.euroecorev.2016.12.009>
- Fernández-López, S., Álvarez-Espino, M., Rey-Ares, L., & Castro-González, S. (2023). Consumer financial vulnerability: review, synthesis, and future research agenda. *Journal of Economic Surveys*, 38(4), 1045–1084. <https://doi.org/10.1111/joes.12573>
- Friedman, M. (1957). *A theory of the consumption function*. Princeton University Press.
- Gathergood, J. (2012). Self-control, financial literacy and consumer over-indebtedness. *Journal of Economic Psychology*, 33(3), 590–602. <https://doi.org/10.1016/j.joep.2011.11.006>
- Goyal, K., & Kumar, S. (2020). Financial literacy: A systematic review and bibliometric analysis. *International Journal of Consumer Studies*, 45(1), 80–105. <https://doi.org/10.1111/ijcs.12605>
- Greenlee, J. S., & Trussel, J. M. (2000). Predicting the financial vulnerability of charitable organizations. *Nonprofit Management and Leadership*, 11(2), 199–210. <https://doi.org/10.1002/nml.11205>
- Gupta, A. S., & Mukherjee, J. (2024). Exploring personal savings versus hedonic consumption in the new normal. *International Journal of Retail & Distribution Management*, 52(1), 107–124. <https://doi.org/10.1108/IJRD-07-2023-0422>
- Gutter, M. S., & Saleem, T. (2005). Financial vulnerability of small business owners. *Financial Services Review*, 14(2), 133.
- Hager, M. A. (2001). Financial vulnerability among arts organizations: A test of the Tuckman-Chang measures. *Nonprofit and Voluntary Sector Quarterly*, 30(2), 376–392. <https://doi.org/10.1177/0899764001302010>
- Hahm, J.-H., Shin, H. S., & Shin, K. (2013). Noncore bank liabilities and financial vulnerability. *Journal of Money, Credit and Banking*, 45(s1), 3–36. <https://doi.org/10.1111/jmcb.12035>
- Haushofer, J., & Fehr, E. (2014). On the psychology of poverty. *Science*, 344(6186), 862–867. <https://doi.org/10.1126/science.1232491>
- Heidhues, P., & Köszegi, B. (2010). Exploiting Naïvete about self-control in the credit market. *American Economic Review*, 100(5), 2279–2303. <https://doi.org/10.1257/aer.100.5.2279>
- Hodge, M. M., & Piccolo, R. F. (2005). Funding source, board involvement techniques, and financial vulnerability in nonprofit organizations: A test of resource dependence. *Nonprofit Management and Leadership*, 16(2), 171–190. <https://doi.org/10.1002/nml.99>
- Hoffmann, A. O. I., & McNair, S. J. (2018). How does consumers' financial vulnerability relate to positive and negative financial outcomes? The mediating role of individual psychological characteristics. *Journal of Consumer Affairs*, 53(4), 1630–1673. <https://doi.org/10.1111/joca.12233>
- Ingale, K. K., & Paluri, R. A. (2022). Financial literacy and financial behaviour: A bibliometric analysis. *Review of Behavioral Finance*, 14(1), 130–154. <https://doi.org/10.1108/RBF-06-2020-0141>
- Jensenius, F. R., Htun, M., Samuels, D. J., Singer, D. A., Lawrence, A., & Chwe, M. (2018). The benefits and pitfalls of Google Scholar. *PS: Political Science & Politics*, 51(4), 820–824. <https://doi.org/10.1017/S104909651800094X>
- Kalil, A., Mayer, S., & Shah, R. (2020). *Impact of the COVID-19 crisis on family dynamics in economically vulnerable households*. University of Chicago, Becker Friedman Institute for Economics Working Paper (2020–2143).
- Kim, Y. I., Joo, H. Y., & Hyoung, C. K. (2016). Household over-indebtedness and financial vulnerability in Korea: Evidence from credit bureau data. *KDI Journal of Economic Policy*, 38(3), 53–77. <https://doi.org/10.23895/kdijep.2016.38.3.53>
- Kuek, T.-H., Puah, C.-H., & Arip, M. A. (2020). Financial vulnerability and economic dynamics in Malaysia. *Journal of Central Banking Theory and Practice*, 9(s1), 55–73. <https://doi.org/10.2478/jcbtp-2020-0023>
- Lachs, M. S., & Han, S. D. (2015). Age-associated financial vulnerability: An emerging public health issue. *Annals of Internal Medicine*, 163(11), 877–878. <https://doi.org/10.7326/M15-0882>
- Lambrecht, B. M. (2001). The impact of debt financing on entry and exit in a duopoly. *Review of Financial Studies*, 14(3), 765–804. <https://doi.org/10.1093/rfs/14.3.765>
- Leandro, J. C., & Botelho, D. (2022). Consumer over-indebtedness: A review and future research agenda. *Journal of Business Research*, 145, 535–551. <https://doi.org/10.1016/j.jbusres.2022.03.023>
- Lee, M. P., & Sabri, M. F. (2017). Review of financial vulnerability studies. *Archives of Business Research*, 5(2), 127–134. <https://doi.org/10.14738/abr.52.2784>
- Lodge, M., & Hood, C. (2011). Into an age of multiple austerities? Public management and public service bargains across OECD countries. *Governance*, 25(1), 79–101. <https://doi.org/10.1111/j.1468-0491.2011.01557.x>
- Loke, Y. J. (2017). Financial vulnerability of working adults in Malaysia. *Contemporary Economics*, 11(2), 205–218. <https://doi.org/10.5709/ce.1897-9254.237>
- Lusardi, A., Mitchell, O. S., & Oggero, N. (2019). Debt and financial vulnerability on the verge of retirement. *Journal of Money, Credit and Banking*, 52(5), 1005–1034. <https://doi.org/10.1111/jmcb.12671>
- Magli, A. S., Sabri, M. F., & Rahim, H. A. (2020). The influence of financial attitude, financial behaviour, and self-belief towards financial vulnerability among public employees in Malaysia. *Malaysian Journal of Consumer and Family Economics*, 25, 175–193.
- Mani, A., Mullainathan, S., Shafir, E., & Zhao, J. (2013). Poverty impedes cognitive function. *Science*, 341(6149), 976–980. <https://doi.org/10.1126/science.1238041>
- Manova, K. (2012). Credit constraints, heterogeneous firms, and international trade. *The Review of Economic Studies*, 80(2), 711–744. <https://doi.org/10.1093/restud/rds036>

- Martín-Legendre, J. I., & Sánchez-Santos, J. M. (2024). Household debt and financial vulnerability: empirical evidence for Spain, 2002–2020. *Empirica*, 51(3), 703–730. <https://doi.org/10.1007/s10663-024-09617-z>
- Mason, K., Cornes, M., Whiteford, M., Dobson, R., Ornelas, B., & Meakin, A. (2018). Homeless people and adult social care in England: Exploring the challenges through researcher-practitioner partnership. *Research, Policy and Planning*, 33(1), 3–14.
- Midões, C., & Seré, M. (2022). Living with reduced income: An analysis of household financial vulnerability under COVID-19. *Social Indicators Research*, 161(1), 125–149. <https://doi.org/10.1007/s11205-021-02811-7>
- Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. *Post-Keynesian Economics*, 1, 338–436.
- Mogaji, E. (2020). Consumers' financial vulnerability when accessing financial services. *Research Agenda Working Papers*, 2020(3), 27–39.
- Moral-Muñoz, J. A., Herrera-Viedma, E., Santisteban-Espejo, A., & Cobo, M. J. (2020). Software tools for conducting bibliometric analysis in science: An up-to-date review. *Professional de la Información/Information Professional*, 29(1), e290103.
- Mukherjee, D., Lim, W. M., Kumar, S., & Donthu, N. (2022). Guidelines for advancing theory and practice through bibliometric research. *Journal of Business Research*, 148, 101–115. <https://doi.org/10.1016/j.jbusres.2022.04.042>
- Noerhidajati, S., Purwoko, A. B., Werdaningtyas, H., Kamil, A. I., & Dartanto, T. (2021). Household financial vulnerability in Indonesia: Measurement and determinants. *Economic Modelling*, 96, 433–444. <https://doi.org/10.1016/j.econmod.2020.03.028>
- O'Connor, G. E., Newmeyer, C. E., Wong, N. Y. C., Bayuk, J. B., Cook, L. A., Komarova, Y., Loibl, C., Lin Ong, L., & Warmath, D. (2019). Conceptualizing the multiple dimensions of consumer financial vulnerability. *Journal of Business Research*, 100, 421–430. <https://doi.org/10.1016/j.jbusres.2018.12.033>
- Orduna-Malea, E., Martín Martín, A., & Delgado Lopez-Cozar, E. (2017). Google Scholar as a source for scholarly evaluation: A bibliographic review of database errors. *Revista española de Documentación Científica*, 40(4), 185.
- Park, D., Ramayandi, A., & Tian, S. (2022). Debt buildup and currency vulnerability: Evidence from global markets. *Emerging Markets Finance and Trade*, 58(7), 2017–2035. <https://doi.org/10.1080/1540496X.2021.1949982>
- Paul, J., Lim, W. M., O'Cass, A., Hao, A. W., & Bresciani, S. (2021). Scientific procedures and rationales for systematic literature reviews (SPAR-4-SLR). *International Journal of Consumer Studies*, 45(4), 1–16. <https://doi.org/10.1111/ijcs.12695>
- Paxton, K. C., Williams, J. K., Bolden, S., Guzman, Y., & Harawa, N. T. (2013). HIV risk behaviors among African American women with at-risk male partners. *Journal of AIDS & Clinical Research*, 4(7), 221. <https://doi.org/10.4172/2155-6113.1000221>
- Pew Charitable Trusts. (2017). Retirement needs and preferences of younger public workers. *Issue Brief*. Retrieved May 3, 2019, from <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2017/05/retirement-needs-and-preferences-of-younger-public-workers>
- Peretti-Watel, P., Fressard, L., Bocquier, A., & Verger, P. (2016). Perceptions of cancer risk factors and socioeconomic status. A French study. *Preventive Medicine Reports*, 3, 171–176. <https://doi.org/10.1016/j.pmedr.2016.01.008>
- Prawitz, A. D., Thomas Garman, E., Sorhaindo, B., O'Neill, B., Kim, J., & Drentea, P. (2006). InCharge Financial Distress/Financial Well-Being Scale: Development, administration, and score interpretation. *Financial Counseling and Planning*, 17(1), 34–50.
- Ramos-Rodríguez, A.-R., & Ruíz-Navarro, J. (2004). Changes in the intellectual structure of strategic management research: a bibliometric study of the Strategic Management Journal, 1980–2000. *Strategic Management Journal*, 25(10), 981–1004. <https://doi.org/10.1002/smj.397>
- Rey-Ares, L., Fernández-López, S., Castro-González, S., & Rodeiro-Pazos, D. (2021). Does self-control constitute a driver of millennials' financial behaviors and attitudes? *Journal of Behavioral and Experimental Economics*, 93, 101702. <https://doi.org/10.1016/j.socec.2021.101702>
- Rodrigo, S. K. (2016). Working for welfare: Inequality and shared vulnerability among the Malaysian middle classes. *Malaysian Journal of Economic Studies*, 53(1), 9–31.
- Rotter, J., Spencer, J. C., & Wheeler, S. B. (2019). Financial toxicity in advanced and metastatic cancer: Overburdened and underprepared. *Journal of Oncology Practice*, 15(4), e300–e307. <https://doi.org/10.1200/jop.18.00518>
- Sabri, M. F., Abd Rahim, H., Wijekoon, R., Fardini, N., Zakaria, A. S. M., & Reza, T. S. (2020). The mediating effect of money attitude on association between financial literacy, financial behaviour, and financial vulnerability. *International Journal of Academic Research in Business and Social Sciences*, 10(15), 340–358. <https://doi.org/10.6007/IJARBS/v10-i15/8254>
- Sachin, B. S., Rajashekar, V., & Dr. Ramesh, B. (2018). Festival spending pattern: its impact on financial vulnerability of rural households. *Social Work Footprint*, 7(5), 48–57.
- Salignac, F., Marjolin, A., Reeve, R., & Muir, K. (2019). Conceptualizing and measuring financial resilience: A multi-dimensional framework. *Social Indicators Research*, 145(1), 17–38. <https://doi.org/10.1007/s11205-019-02100-4>
- Salisbury, L. C., Nenkov, G. Y., Blanchard, S. J., Hill, R. P., Brown, A. L., & Martin, K. D. (2022). Beyond income: Dynamic consumer financial vulnerability. *Journal of Marketing*, 87(5), 657–678. <https://doi.org/10.1177/00222429221150910>

- Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science*, 338(6107), 682–685. <https://doi.org/10.1126/science.1222426>
- Shultz, C. J., & Holbrook, M. B. (2009). The Paradoxical relationships between marketing and vulnerability. *Journal of Public Policy & Marketing*, 28(1), 124–127. <https://doi.org/10.1509/jppm.28.1.124>
- Singh, K. N., & Malik, S. (2022). An empirical analysis on household financial vulnerability in India: Exploring the role of financial knowledge, impulsivity and money management skills. *Managerial Finance*, 48(9/10), 1391–1412. <https://doi.org/10.1108/MF-08-2021-0386>
- Smith, D. B., Feng, Z., Fennell, M. L., Zinn, J. S., & Mor, V. (2007). Separate and unequal: Racial segregation and disparities in quality across U.S. nursing homes. *Health Affairs (Project Hope)*, 26(5), 1448–1458. Health <https://doi.org/10.1377/hlthaff.26.5.1448>
- Sullivan, L., & Meschede, T. (2016). Race, gender, and senior economic well-being: How financial vulnerability over the life course shapes retirement for older women of color. *Public Policy & Aging Report*, 26(2), 58–62. <https://doi.org/10.1093/ppar/prw001>
- Thangavel, P., & Chandra, B. (2023). Two decades of M-commerce consumer research: A bibliometric analysis using R biblioshiny. *Sustainability*, 15(15), 11835. <https://doi.org/10.3390/su151511835>
- Thomas, R., & Trafford, R. (2012). Were UK culture, sport and recreation charities prepared for the 2008 economic downturn? An application of Tuckman and Chang's measures of financial vulnerability. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 24(3), 630–648. <https://doi.org/10.1007/s11266-012-9273-1>
- Trussel, J. M. (2002). Revisiting the prediction of financial vulnerability. *Nonprofit Management and Leadership*, 13(1), 17–31. <https://doi.org/10.1002/nml.13103>
- Trussel, J. M., & Greenlee, J. S. (2004). A financial rating system for charitable non-profit organizations. *Research in Governmental and Nonprofit Accounting*, 11, 105–127.
- Tuckman, H. P., & Chang, C. F. (1991). A methodology for measuring the financial vulnerability of charitable non-profit organizations. *Nonprofit and Voluntary Sector Quarterly*, 20(4), 445–460. <https://doi.org/10.1177/089976409102000407>
- Turunen, E., & Hilamo, H. (2014). Health effects of indebtedness: a systematic review. *BMC Public Health*, 14(1), 489. <https://doi.org/10.1186/1471-2458-14-489>
- Van Aardt, C. J., Moshoeu, A., Risenga, A., Pohl, M., & Coetzee, M. C. (2009). A consumer financial vulnerability (CFV) index for South Africa. University of South Africa (Unisa), Bureau of Market Research (BMR)
- Whelan, C. T. (2001). Income, deprivation, and economic strain. An analysis of the European community household panel. *European Sociological Review*, 17(4), 357–372. <https://doi.org/10.1093/esr/17.4.357>
- Worthington, A. C. (2013). Financial literacy and financial literacy programmes in Australia. *Journal of Financial Services Marketing*, 18(3), 227–240. <https://doi.org/10.1057/fsm.2013.18>
- Xu, X., Chen, X., Jia, F., Brown, S., Gong, Y., & Xu, Y. (2018). Supply chain finance: A systematic literature review and bibliometric analysis. *International Journal of Production Economics*, 204, 160–173. <https://doi.org/10.1016/j.ijpe.2018.08.003>
- Yan, E., & Ding, Y. (2011). Discovering author impact: A PageRank perspective. *Information Processing & Management*, 47(1), 125–134. <https://doi.org/10.1016/j.ipm.2010.05.002>
- Zhang, C. P., & Kang, R. (2016). Measurement and analysis of China's financial vulnerability during 2005–2014. *Trends of Management in the Contemporary Society*, 56, 60.
- Ziliak, J. P. (2015). Income, program participation, poverty, and financial vulnerability: Research and data needs. *Journal of Economic and Social Measurement*, 40(1–4), 27–68. <https://doi.org/10.3233/JEM-150397>