

# ***Insights into the Association between Financial Literacy and Stock Market Participation of Retail Investors: A Bibliometric Review***

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*The proposed work is intended to provide insights into past and contemporary research themes in financial literacy and stock market participation by employing the technique of bibliometric analysis. Bibliographic information involving financial literacy and stock market participation was compiled from Scopus, which generated 1628 documents spanning from 1991 to 2022. In order to execute various bibliometric analyses and evaluations, Biblioshiny - an open-source platform, was used in this research paper. The analysis of the bibliographic data offered a detailed description of the theme of financial literacy and stock market participation. Further it addressed the contemporary themes and trends in the subject area. The themes of financial literacy, financial education, risk tolerance, household finance, financial advice, and stock market participation were discovered to be the less-researched areas in this domain. To better comprehend the idea of financial literacy and propagate its relevance to investors and non-investors, further research may be carried out on these topics.*

*Keywords: Financial Literacy, Stock Market Participation, Retail Investors, Bibliometric Analysis, Biblioshiny*

## **1. Introduction**

The economy is witnessing the emergence and spread of diverse and complicated investment avenues, many of which are tricky for investors who are not proficient in financial matters, to understand (Lusardi & Mitchell, 2014). Considering the prevailing progressive financial market landscape, investors ought to be well-versed in financial

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matters to make appropriate choices that promote their financial welfare in such an era of growing financial intricacies (Mancebon *et al.*, 2019).

According to Lusardi & Mitchell (2014), financial literacy refers to a person's competence to analyse financial data and making sensible choices on asset accumulation, liabilities, retirement and financial planning. A person can use information and skills to administer their financial resources effectively and is the key to long-term financial stability, security and prosperity (Munir *et al.*, 2020). To make a conscious, rational, and sensible financial decision about, one must develop financial proficiency and skills (Nemeth *et al.*, 2022). Financial literacy empowers individuals to strengthen their financial resilience and facilitate them to take sensible decisions about borrowing, savings, investing, and other financial matters (Klapper & Lusardi, 2019).

Even in highly developed financial economies, financial illiteracy is prevalent, and people with low literacy levels are more prone to have debt issues and face financial difficulties (Lusardi & Mitchell, 2011). Financial literacy is inadequate among younger generations and is shaped majorly by their academic background, the quality of education attained, and the financial expertise of their parents (Lusardi *et al.*, 2010). Despite their education, women score low on basic and advanced financial literacy and are less risk-taking than their male counterparts (Almenberg & Dreber, 2015; Van Rooij *et al.*, 2011).

Households with better financial literacy allocate their wealth over a wide range of investment products (Van Rooij *et al.*, 2012). Financially literate individuals are more mindful of risk-return trade-offs and can make better investment decisions (Klapper & Lusardi, 2019). Competent and sensible investors are indispensable for the country's economic force to thrive and prosper in the long term (Afshar, 2015). Individuals and society can both enjoy a great deal by investing in stocks. Munir *et al.* (2020) stated that with adequate financial understanding, one could put their funds in the stock market, boosting their earnings on the one hand and reaping long-term benefits on the other. They also pointed out that, by garnering more investors and investment, stock market engagement also promotes the country's economic prosperity.

According to Van Rooij *et al.* (2011), the odds of an individual engaging in stock market trading and owning stocks rise with better education and financial literacy and when they accumulate more wealth. When it comes to investing in the stock market, those who are

more financially literate and insightful about the operations of the stock market opt to engage more in it than those who are less literate (Munir *et al.*, 2020). Being proficient in financial matters reduces the expenses associated with acquiring and processing information which empowers financial literates to engage actively in stock markets (Van Rooij *et al.*, 2012). Lusardi & Mitchell (2011), through their study “Financial literacy around the world: An overview”, found that individuals with a higher level of financial literacy pursue incorporating stocks in their portfolios since they comprehend the idea of risk diversification better. They are also better equipped for retirement and accumulate three times the wealth of financially illiterate individuals.

A study on the overall status of research in financial literacy and stock market participation is imperative, considering the growing relevance of financial literacy in this dynamic financial market landscape and its prominence in promoting and participating in stock market activities. Using the technique of bibliometric analysis, the proposed work seeks to provide insights into past and contemporary research themes in financial literacy and stock market participation. This analysis is pivotal because it will help to identify literature gaps in the particular domain, and will provide directions for future work.

Keeping up with everything published has become challenging due to the exponential growth in the volume of scholarly publications. The sheer volume of information, the time needed to evaluate new materials, and difficulty in objectively appraising the content and quality of the massive data make it highly challenging for the researchers to keep up with new progressions in their discipline (Linnenluecke *et al.*, 2020). Academicians and scholars are encouraged to adopt bibliometrics (Broadus, 1987) in such a scenario. Bibliometrics is beneficial in offering a organised, structured, transparent, unbiased, and reproducible analysis. A large body of literature is subjected to a systematic study by bibliometrics to track addressed themes, discover transitions in the subject domains and changes in patterns over time and provide the current status of the existing literature (Aria & Cuccurullo, 2017).

## 2. Objectives of the Study

Despite the relevance of financial literacy in promoting and participating in the stock market, the dynamics of this study stream have not systematically been explored in any previous studies yet. The proposed work uses bibliometric techniques to offer insights

into past and contemporary research themes in this realm. The research objectives are listed below:

- 1) To determine the most relevant sources in this area of study.
- 2) To identify the most relevant authors who have made the most remarkable contributions to this particular topic.
- 3) To highlight the countries that have produced the most work in this research area.
- 4) To examine the most in academic papers in this line of research.
- 5) To list the main keywords addressed by this research theme.
- 6) To determine the trending topics and most prominent themes in this field of investigation.

### 3. Research Methodology

In this paper, bibliometric analysis is employed to explore the existing literary works in financial literacy and stock market participation. According to Gutierrez-Salcedo *et al.* (2018), the word “bibliometrics” denotes a series of tools designed to track and evaluate scientific research using publications archived or indexed in major bibliographic databases. Choosing a single appropriate database, based on the extent of its coverage, is advocated by Donthu *et al.* (2021) to reduce the possibility of human errors while merging and evaluating the data from multiple databases. The major databases for locating high-quality publications include Scopus and Web of Science. Compared to Web of Science, Scopus has more extensive journal coverage across all subject domains (Mongeon & Paul-Hus, 2016). Additionally, compared to the Web of Science, its citation analysis is speedier and covers more literature (Falagas *et al.*, 2008). Hence, in the study Scopus database is used to gather the data.

**Table 1: Journals listed in databases**

	Scopus	Web of Science
Total Journals (as of 23-08-2022)	40,562	24,769

Source: Compiled by the author based on secondary data.

Data extraction was carried out in August 2022. “Financial literacy”, “financial education”, “financial knowledge”, “financial awareness”, “stock market”, “stock market participation”, “stock market investors”, “share market investors”, “share

market”, “share market participation”, “stock trading”, were the terminologies chosen to track down the documents, which resulted in a total 1628 documents spanning from 1991 to 2022. Table 2 lists the criteria used to locate the data.

**Table 2: Criteria used for locating the data**

Criteria	Category	Comment
Subject Area	Economics, Econometrics and Finance	The study exclusively took into account publications in finance, economics and econometrics.
Language	English	The present investigation focused on documents written in English only.
Source Type	Journal	The search was confined to documents published in journals.
Document Type	Article	In this study, articles that had been successfully published were taken into account.

Source: Compiled by author

The present study has used Biblioshiny, an R-developed virtual interface, an element of the “bibliometrix” package, for the bibliometric analysis. Bibliometrix is a package developed in R language for undertaking a meticulous evaluation of scientific literature using the science mapping technique (Aria & Cuccurullo, 2017). The application of bibliometric analysis is only justified if the subject domain has hundreds (for instance, 500 or more) or thousands of publications in the same field (Donthu *et al.*, 2021). Here we have obtained 1628 articles from the database for analysis; hence the use of bibliometrics is justified.

#### 4. Results

Table 3 presents 1628 articles tracked down from the Scopus database published between 1991 and 2022 (as of August 2022) in the domain of stock market participation and financial literacy. These documents were published in 418 journals. 3273 authors contributed to those documents, with 226 being single-authored and the remaining (3047) being multi-authored. Each article had an average of 2.66 co-authors. There were 3498 keywords compiled by authors, which was more than double the number of papers.

The average number of citations per document is 18.71, which is a substantial figure and reflects the prominence of the research on stock market participation and financial literacy.

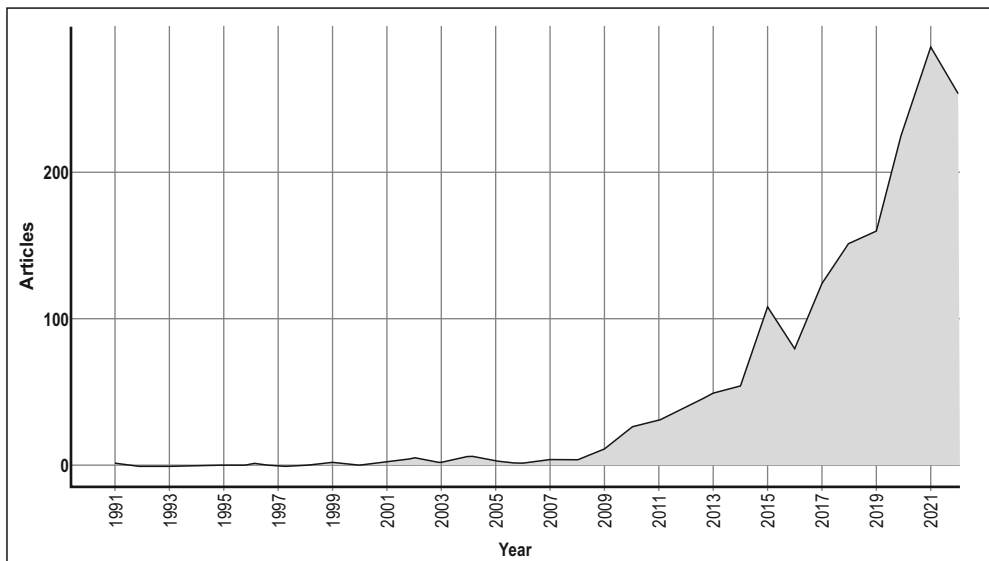
**Table 3: Principal details corresponding to the dataset**

Description		Results
Main information about the data	Timespan	1991:2022
	Sources (Journals)	418
	Documents	1628
	Annual Growth Rate (%)	19.54
	Average citations per doc	18.71
	References	84573
Authors	Authors	3273
	Authors of single-authored docs	226
	Authors of multi-authored docs	3047
Authors Collaboration	Single-authored docs	250
	Co-Authors per Doc	2.66
	International co-authorships (%)	27.4
Document types	Article	1628
Document contents	Keywords Plus (ID)	465
	Author's Keywords (DE)	3498

Source: Compiled from Biblioshiny

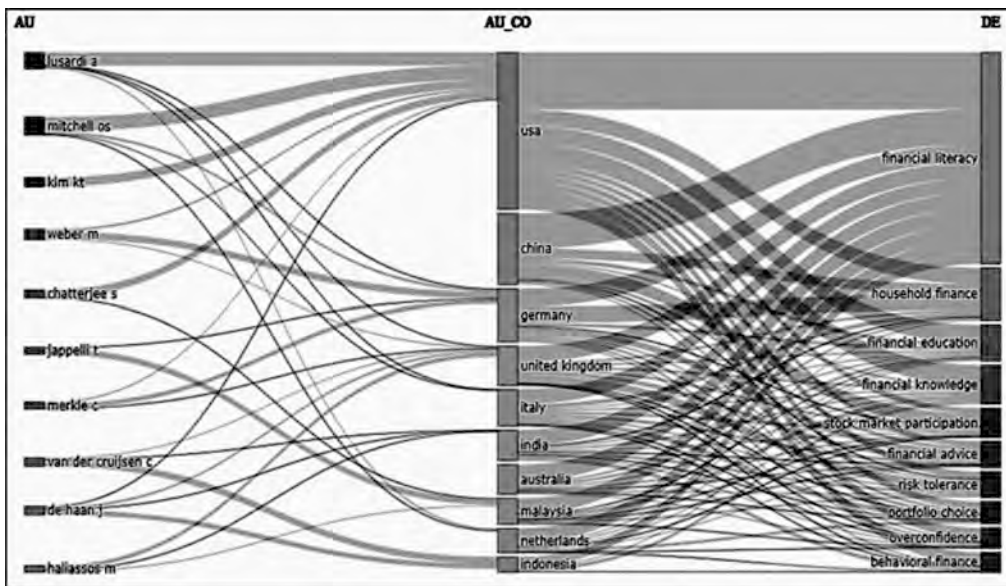
Annual scientific production of articles published on stock market participation and financial literacy (figure 1) highlighted the exponential growth in this area, notably beginning in 2017, with 73.71% of all studies published between 2017 and 2022. This result elucidates the growing popularity and progress in this field, with an annual growth rate of 19.54 per cent, suggesting that it is a key area of research.

Figure 1: Annual Scientific Production



Source: Compiled from Biblioshiny

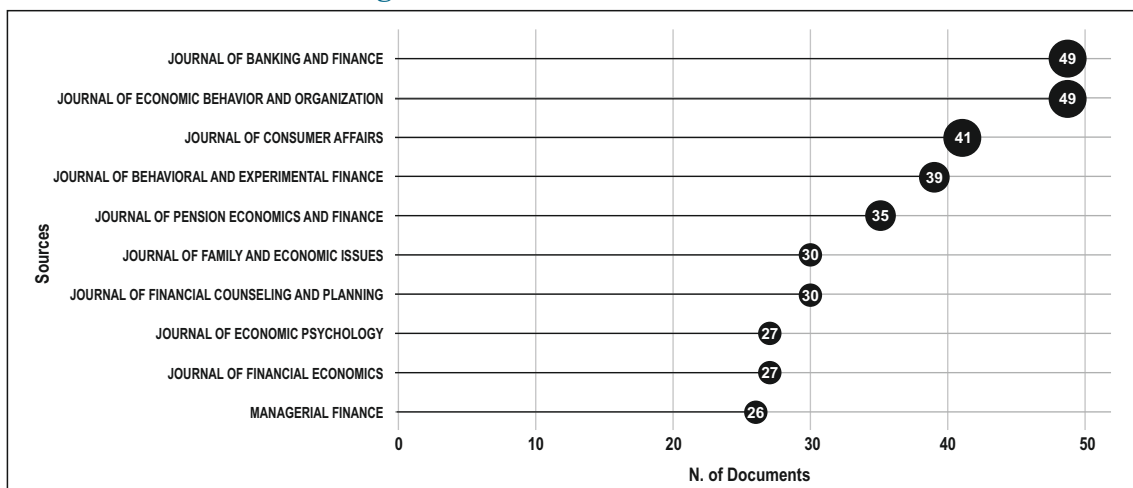
Figure 2: Three-Field Plot



Source: Compiled from Biblioshiny

The relationships between authors, countries and author's keywords within financial literacy and stock market participation are illustrated using a three-field plot (figure 2). The first column highlights the leading ten authors in this subject area, the second column presents the top ten countries actively contributing to this domain, and the third column lists the ten most frequently used keywords by the authors. The height of each box and the thickness of the connecting lines are accentuated while deciphering the plot. The taller the box, the more significant it was in the overall context, the thicker the interconnecting lines, the greater the volume of work produced. This plot brings us to the conclusion that Lusardi A, Mitchell O S, and Kim K T were the most eminent authors. The countries with the highest scholarly production and author associations were reported to be the USA, China, and Germany. Financial literacy, household finances, and financial education were listed as the keywords extensively used by the authors.

**Figure 3: Most Relevant Sources**



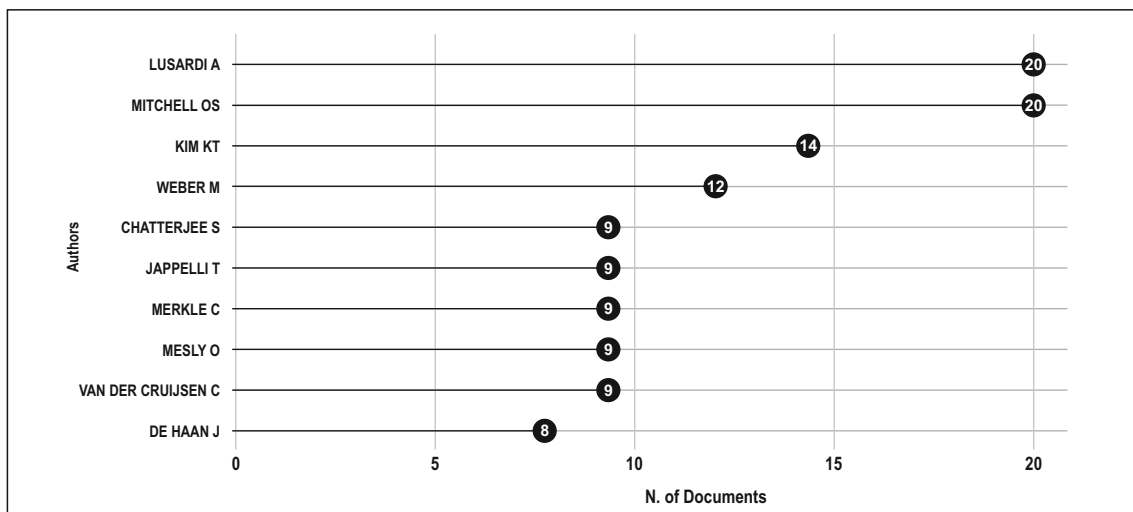
Source: Compiled from Biblioshiny

Figure 3 portrays the ten leading publication sources in terms of productivity. Overall, there were 1628 documents distributed over 418 sources in the collection. With 49 documents each, the most productive journals are “Journal of Banking and Finance” and “Journal of Economic Behavior and Organization”. “Journal of Consumer Affairs” comes in second place with a score of 41, followed by “Journal of Behavioral and Experimental Finance” (39), “Journal of Pension Economics and Finance” (35), “Journal



of Family and Economic Issues” (30), “Journal of Financial Counseling and Planning” (30), “Journal of Economic Psychology” (27), “Journal of Financial Economics” (27), and “Managerial Finance” (26).

**Figure 4: Most Relevant Authors**



Source: Compiled from Biblioshiny

3273 authors provided contributions in the realms of financial literacy and stock market participation. The top ten notable authors in terms of the number of documents are shown in figure 4. With 20 documents, Annamaria Lusardi (5416 citations) and Olivia S Mitchell (3311 citations) are explicitly the most productive authors in this sphere, followed by Kyoung Tae Kim, Martin Weber, Swarn Chatterjee, Tullio Jappelli, Christoph Merkle, Olivier Mesly, Carin Van Der Cruijsen, and Jakob De Haan.

**Table 4: Most Cited Countries**

Country	Total Citations
USA	9268
Italy	1665
Germany	1449
United Kingdom	998
Netherlands	996

China	781
Australia	605
France	399
Sweden	358
Switzerland	331

Source: Compiled from Biblioshiny

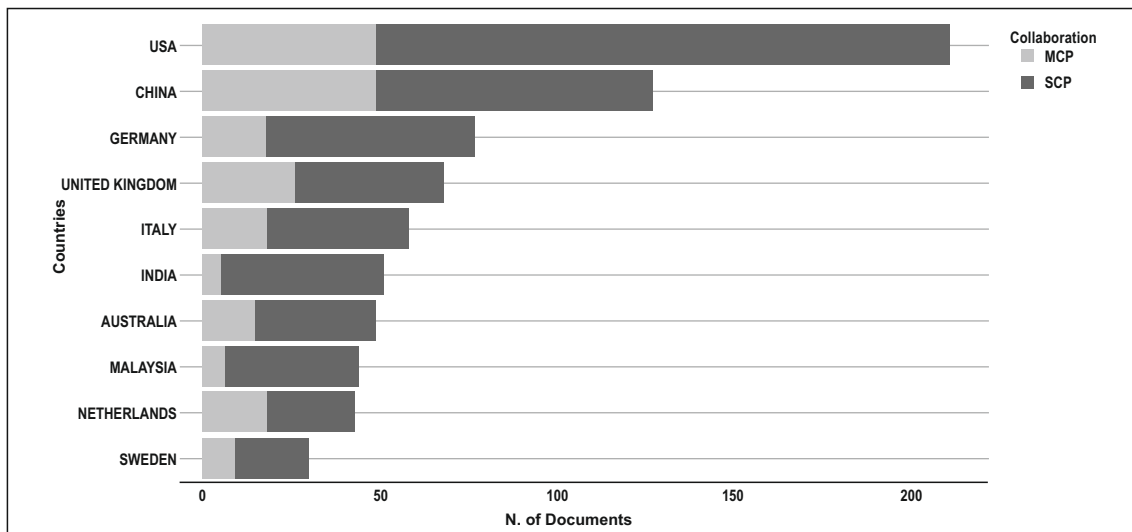
Table 4 shows the top ten countries with the highest number of citations in terms of their publications. With 9268 citations, the USA takes the top spot worldwide. With a score of 1665 citations, Italy is ranked second. Having received 1449 citations, Germany took the third spot. UK (998), Netherlands (996), China (781), Australia (605), France (399), Sweden (358), and Switzerland are the next in line (331).

**Table 5: Country collaboration: Corresponding Author's Country**

Country	Articles	SCP	MCP	MCP Ratio
USA	211	162	49	0.232
China	127	78	49	0.386
Germany	77	59	18	0.234
United Kingdom	68	42	26	0.382
Italy	58	40	18	0.31
India	51	46	5	0.098
Australia	49	34	15	0.306
Malaysia	44	38	6	0.136
Netherlands	43	25	18	0.419
Sweden	30	21	9	0.3

Source: Compiled from Biblioshiny

**Figure 5: Country collaboration: Corresponding Author's Country**



Source: Compiled from Biblioshiny

Table 5 and figure 5 exhibit the corresponding authors' countries along with the volume of articles they have authored. It also analyses the proportion of single-country publications (SCP), multiple-country publications (MCP), and multiple-country publication ratios (MCP ratio). As per the available statistics on country collaboration, the corresponding author's country with the highest number of publications is the USA (211), where 162 documents were the result of intra-country collaboration (SCP), and 49 documents were the product of inter-country collaboration (MCP) with a MCP ratio of 0.232. China secured the second spot with 127 publications, of which 49 documents were multiple-country publications with a MCP ratio of 0.386. The third and fourth countries in the line-up were Germany and the United Kingdom, with 18 out of 77 documents (MCP- 0.234) and 26 out of 68 (MCP- 0.382) multiple-country publications, respectively. The higher multiple country publications (MCP) ratio portrays how closely a country collaborates with other nations. Following the data extracted, MCP was observed to range from 20 per cent to 40 per cent for the top ten countries when it came to collaboration, signalling that each country had exhibited a considerable inclination to inter-country collaboration in the fields of financial literacy and stock market participation.

**Table 6: Country Scientific Production**

Region	Frequency
USA	857
China	409
Germany	268
UK	236
India	210
Australia	196
Italy	196
Malaysia	170
Netherlands	161
Indonesia	108

Source: Compiled from Biblioshiny

Table 6 enumerates the leading nations in terms of scientific production. The figures point out that, with a contribution of 857 documents, the USA is the most resourceful country. China ranks second in terms of productivity, producing 409 articles. It is followed by Germany (268), the UK (236), India (210), Australia (196), Italy (196), Malaysia (170), the Netherlands (161) and Indonesia (108).

**Table 7: Most Globally Cited Documents**

Paper	First Author	Journal	DOI	Total Citations
Understanding earnings quality: A review of the proxies, their determinants and their consequences	Patricia Dechow	Journal of Accounting and Economics	10.1016/j.jacceco.2010.09.001	1436
The Economic Importance of Financial Literacy: Theory and Evidence	Annamaria Lusardi	Journal of Economic Literature	10.1016/j.jacceco.2010.09.001	1224
Financial literacy and stock market participation	Maarten C J Van Rooij	Journal of Financial Economics	10.1016/j.jfineco.2011.03.006	1028

Household Finance	John Y Campbell	The Journal of Finance	10.1111/j.1540-6261.2006.00883.x	976
Social Interaction and Stock-Market Participation	Harrison Hong	The Journal of Finance	10.1111/j.1540-6261.2004.00629.x	700
Financial Literacy among the Young	Annamaria Lusardi	The Journal of Consumer Affairs	10.1111/j.1745-6606.2010.01173.x	584
Financial literacy around the world: an overview	Annamaria Lusardi	Journal of Pension Economics and Finance	10.1017/S1474747211000448	557
Financial Literacy, Retirement Planning and Household Wealth	Maarten C J Van Rooij	The Economic Journal	10.1111/j.1468-0297.2012.02501.x	374
The Age of Reason: Financial Decisions over the Life Cycle and Implications for Regulation	Sumit Agarwal	Brookings Papers on Economic Activity	10.1353/eca.0.0067	365
Cognitive abilities and portfolio choice	Dimitris Christelis	European Economic Review	10.1016/j.eurocorev.2009.04.001	354

Source: Compiled from Biblioshiny

In the context of financial literacy and stock market participation, the documents which garnered the most citations worldwide are furnished in table 7. The research paper by Patricia Dechow, Weili Ge, and Catherine Schrand entitled “Understanding earnings quality: A review of the proxies, their determinants and their consequences”, which appeared in the “Journal of Accounting and Economics” earned the highest number of citations (1436). The second on the list is “The Economic Importance of Financial Literacy: Theory and Evidence”, which was cited 1224 times and was written by Annamaria Lusardi and Olivia S. Mitchell. “Financial literacy and stock market participation”, authored by Maarten C J Van Rooij, Annamaria Lusardi, and Rob J M Alessie, came in the third position with 1028 citations.

**Table 8: Most Frequent Words**

Words	Occurrences
Financial Literacy	380
Household Finance	80
Financial Education	65
Financial Knowledge	55
Financial Advice	45
Risk Tolerance	44
Overconfidence	43
Stock Market Participation	43
Behavioural Finance	41
Portfolio Choice	38

Source: Compiled from Biblioshiny

Table 8 enumerates the ten extensively used keywords by the authors in their research articles. Based on the estimates, the term “financial literacy” appeared the most (380 times), followed by “household finance” (80 occurrences) and “financial education” (65 occurrences). These were followed by “financial knowledge” (55), “financial advice” (45), “risk tolerance” (44), “overconfidence” (43), “stock market participation” (43), “behavioural finance” (41), and “portfolio choice” (38).

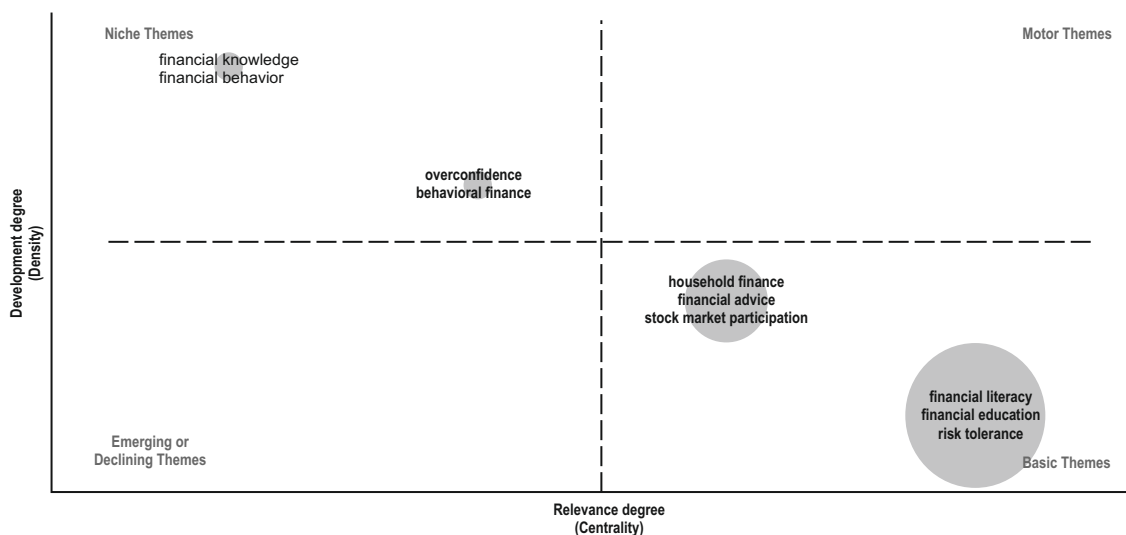
**Figure 6: Co-occurrence Network of Keywords**



Source: Compiled from Biblioshiny

Figure 6 exhibits a co-occurrence network of keywords, which illustrates the intensity of association between the top ten keywords in financial literacy and stock market participation. It is evident from the figure that the most prominent keyword is financial literacy, and it is linked to all the other top nine keywords. The most vital link has been identified between financial literacy and financial education. The second-strongest related keywords are financial literacy and family finances, followed by financial literacy and financial knowledge.

**Figure 7: Thematic Map**



Source: Compiled from Biblioshiny

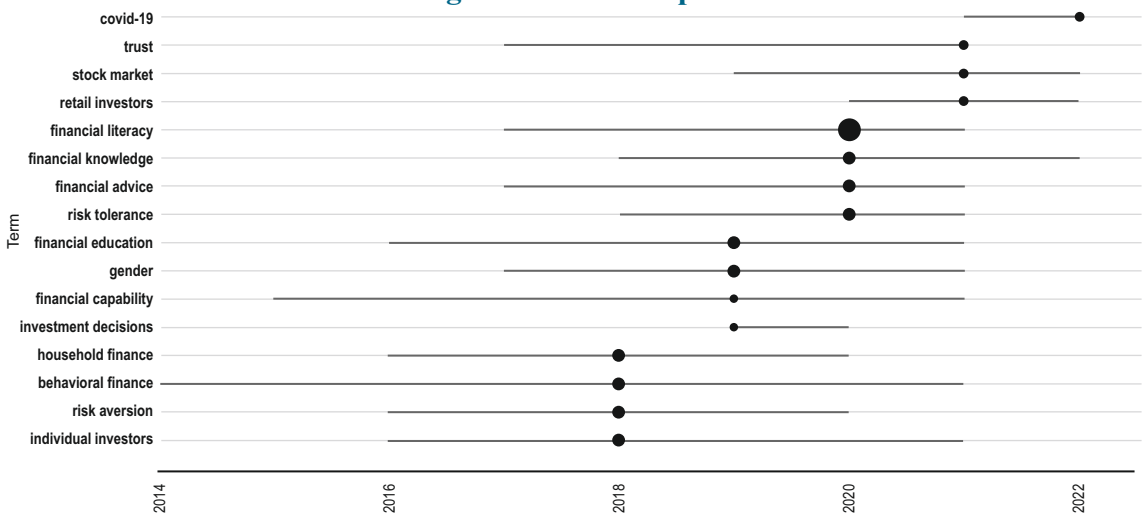
The thematic map within the scope of financial literacy and stock market participation is showcased in Figure 7. The primary themes in the lower right quadrant - financial literacy, financial education, risk tolerance, household finance, financial advice and stock market participation - indicate essential but less explored fields. The niche themes in the upper left quadrant – “financial knowledge”, “financial behavior”, “overconfidence” and “behavioral finance” are of minimal relevance in this subject.

**Table 9: Trend Topics**

Topics	Frequency	Year
Household Finance	80	2018
Behavioral Finance	41	2018
Risk Aversion	27	2018
Individual Investors	26	2018
Financial Education	65	2019
Gender	36	2019
Financial Capability	19	2019
Investment Decisions	18	2019
Financial Literacy	380	2020
Financial Knowledge	55	2020
Financial Advice	45	2020
Risk Tolerance	44	2020
Trust	29	2021
Retail Investors	17	2021
Stock Market	17	2021
Covid-19	21	2022

Source: Compiled from Biblioshiny

**Figure 8: Trend Topics**



Source: Compiled from Biblioshiny



Trending topics in the context of financial literacy and stock market participation over the past five years, from 2018 to 2022, are presented in Table 9 and figure 8. In the year 2018, the most popular themes were household finance (80), behavioral finance (41), risk aversion (27), and individual investors (26). Financial education (65), gender (36), financial capability (19) and investment decisions (18) were the prominent topics in the year 2019. The trending topics in 2020 were financial literacy (380), financial knowledge (55), financial advice (45) and risk tolerance (44). Trust (29), retail investors (17) and stock market (17) were the leading topics in 2021. The most popular topic in 2022 is Covid-19 (21). The theme of financial literacy, which was addressed 380 times, is observed to be the most prominent topic over these years. The second most frequently studied topic is household finance, with 80 instances followed by financial education, which appeared 65 times, and financial knowledge, which appeared 55 times.

## **Discussion**

The most renowned authors in financial literacy and stock market participation were Annamaria Lusardi, Olivia S Mitchell, and Kyoung Tae Kim. USA, Italy, and Germany were the top three countries in terms of publications with the most citations. The countries with the highest thresholds of scholarly production and author associations were the USA, China, and Germany. The higher multiple country publications (MCP) ratio portrays how closely a country collaborates with other nations. According to the data extracted, MCP was observed to range from 20 per cent to 40 per cent for the top ten countries regarding collaboration, signalling that every country exhibited a strong propensity for inter-country collaboration in the fields of financial literacy and stock market participation.

The authors frequently incorporated the terms - financial literacy, household finances, and financial education in their work. In the context of financial literacy and stock market participation, trending topics encompassed - household finance, behavioral finance, risk aversion, individual investors, financial education, gender, financial capability, investment decisions, financial literacy, financial knowledge, financial advice, risk tolerance, trust, retail investors, and stock market. The niche themes like financial knowledge, financial behavior, overconfidence, and behavioral finance have minimal

bearing on this subject matter. The themes of financial literacy, financial education, risk tolerance, household finance, financial advice, and stock market participation are discovered to be the less-researched areas in this domain. To better comprehend the idea of financial literacy and propagate its relevance to investors and non-investors, further research may be carried out on these topics.

## Conclusion

Considering the growing relevance of financial literacy in this dynamic financial market environment and its prominence in promoting and participating in stock market activities, a study on the overall status of research in the domain of financial literacy and stock market participation was essential.

Numerous investment outlets are emerging and spreading in the market. In such a progressive financial market landscape, investors ought to be well-versed in financial matters to make appropriate choices that promote their financial welfare. By enabling people to make informed decisions about borrowing, saving, investing, and other financial matters, financial literacy empowers people to improve their financial resilience. Competent and prudent investors are necessary for the long-term well-being and prosperity of the nation's economy. Individuals with a superior level of financial literacy are more likely to integrate stocks in their portfolios. They amass three times the wealth of those who lack financial literacy and are better prepared for retirement.

Financial education must be reinforced in formal education and beyond to raise a generation of financially competent people (Nemeth *et al.*, 2022). Likewise, as suggested by Lusardi *et al.* (2010), it is essential to devise initiatives exclusively for women, as they exhibit low financial awareness and substantial discrepancies in their investing and saving behaviour. Financial institutions will be prompted to develop new products to meet the expectations of financially literate clients, as per their needs. They will be urged to accentuate their standards of service and risk management, elevating the efficiency of the finance industry, economic growth, and less volatile markets (Klapper & Lusardi, 2019). This study recommends that financial literacy be recognised as a critical component in encouraging stock market participation by policymakers, financial institutions, and household members.

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