

ROLE OF BEHAVIOURAL FINANCE ON INVESTMENT DECISION: A BIBLIOMETRIC STUDY

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Abstract

Need of the study: Many studies have been conducted in the field of behavioral finance, but few have used scientific and technical mapping to understand recent trends. This study aims to fill that gap by using bibliometric mapping to identify and analyze the current patterns in the field of behavioral finance. **Methodology:** Bibliometric study method has been adopted with the sample of 1751 articles which were extract from the Scopus data base for the period 2001-2023. Bibliometrix (Ariaa and Cuccurullo, 2017) and Vos viewer web-based software were utilized to develop the contents. Study has undergone with citation analysis, most relevant source and high contributed articles, cross country collaboration, three field analysis, Co-words analysis and cluster mapping analysis were conducted. **Findings:** Result shows that Numerous research in this topic is undertaken in developed countries such as the United States, Spain, and China, emphasizing the need for research on the impact of behavioural psychology on Indian investors. In initial stages most of studies focus on how behavioral finance affects investor sentiment, impacting market volatility, stock returns, asset pricing, overreaction to trends and decision making by considering single investment avenue i. e., equity. However, limited research explores the influence of psychological biases on sentiment and its subsequent effect on investment decision-making, by considering alternate financial investment options and various behavioral biases.

Keywords: Behavioural Finance, Investment Decision, Investor Sentiment and Bibliometric Analysis.

INTRODUCTION

Behavioural finance is an interdisciplinary field that combines the study of psychology and finance to better understand how investors behave in the financial markets. The efficient markets theory is called into question, with a focus on market anomalies and the importance of using diverse modelling techniques to accurately represent real-world market dynamics (Shiller, 2003). In decision-making under risk, prospect theory offers an alternative model in response to criticisms of expected utility theory. It provides insights into behavioural finance by pointing out cognitive biases that influence people's assessments of gains, losses, and probabilities, such as the certainty effect and isolation effect (Kahneman & Tversky, 1979). As demonstrated by the study of Kahneman and Tversky, behavioural finance investigates decision-makers aversion to loss recognition in uncertain situations. It incorporates tax issues with psychological elements including self-control, regret aversion, and mental accounting (Thaler, 1980). This method highlights the significance of comprehending human behaviors in financial decision processes by explaining observable patterns in financial markets (Shefrin & Statman, 1985). Hence behavioural finance is a branch of finance that studies how

psychological and cognitive variables influence financial decisions. Whereas classical behaviour believes that investors are rational or homoeconomicus, contemporary theory (behavioural finance) suggests that investors are irrational or quasi-rational as a result of psychological influences. (*Barberis, Shleifer & Vishny, 1998*).

Introduction to Bibliometric Analysis

Bibliometric analysis makes use of math, statistics, and algorithms to examine and arrange large amounts of data. By methodically reading and analyzing literature, it helps researchers find hidden patterns in literature reviews. (*Kraus et al., 2022; Lim, Kumar, et al., 2022; Mukherjee et al., 2022;*). In the opinion of (*Donthu et al., 2021*) it is, a robust method in scientific research, examines large data sets, revealing field evolution and emerging trends, with emerging applications in business research. Hence Bibliometric analysis is a quantitative technique for evaluating the influence and trends of scholarly publications within a specific topic. In order to assess research productivity, find key texts, and monitor changes over time, data from citations, journals, and authors are analysed.

LITERATURE REVIEW

Behavioural finance, a relatively new topic in the financial sector, has prompted a slew of studies on its impact on the financial market. Several scholars have undertaken comprehensive literature evaluations and provided their insights on the role of behavioural theory in this subject. (*Kumar & Goyal, 2015*) examines behavioural biases in investment decision-making by using the systematic literature review (SLR) method to analyse 117 chosen publications from peer-reviewed journals. Individual behavioural biases are highlighted when the research evaluates the effects of cognitive biases on trading behaviour, market returns, volatility, and portfolio selection. The results show a high frequency of research using secondary data and a lack of clarity in the herding bias findings. Whereas (*López-Cabarcos et al., 2019*) uses bibliometric analysis and co-citation and co-occurrence studies to gain insight into investor sentiment in behavioural finance. It reveals essential principles, major articles, authors, and the growing importance of sentiment since 2014, emphasising multidisciplinary connections and guiding future behavioural finance research. Several studies has concentrated on examination of behavioural finance and accounting through a comprehensive bibliometric analysis, identifying unique trends. Behavioural finance focuses on sentiment, social media, and biases such as overconfidence, whereas behavioural accounting investigates biases through experimental studies. Despite its limitations, the work offers important insights for future research in this dynamic juncture (*Singh, 2021*). (*Dheyaa Abdulrasool & Binti Othman, 2020*) investigates global trends in Behavioural Finance (BF) research by analysing Scopus publications from 2009 to 2019. Author emphasises B. Fin as a critical theoretical foundation for business investment, emphasises research expansion, international cooperation, and recognises established and emerging research fields. (*Costa et al., 2018*) analyse the Behavioural Economics and Behavioural Finance published Web of Science database. It highlights prominent persons' influence, identifies the United States as a major contribution, and emphasises the theoretical link between the two subjects. The paper finishes by

emphasising their increasing significance and research possibilities. According to the literature review on the relevant study area, a substantial amount of research is conducted in the form of systematic literature reviews, and certain studies have been conducted on the influence of behavioural finance on investor sentiment, behavioural accounting, and the scientific field of human psychology. As a result, there is a need to do bibliometric research on recent trends in behavioural finance in the post-covid era. As a result, this study provides a comprehensive review of behavioural finance using bibliometric analysis.

METHODOLOGY

This research, classified as a bibliometric analysis, used papers of Scopus Database. It is within the descriptive category and uses a quantitative methodology (*Costa et al., 2018*), (*Kumar, Rao, et al., 2022*, *Baker et al., 2021*). Data from the years 2001 to 2023 were retrieved using pertinent keywords like "Behavioural Finance", "Behavioral Finance" or "psychological Finance" and "Investment Decision." English-language search terms were used to conduct the search across all scientific disciplines. A total of 1864 highly cited articles were gathered from the database in the first step. A title review was done to determine the importance of these articles. 93 documents were excluded from the dataset after they were determined to be unrelated to the study topic and based on the review. The remaining 1751 papers were chosen for bibliometric analysis in the last phase. Biblioshiny and Vos viewer web-based software were utilized to develop the contents. Study has undergone with citation analysis, most relevant source and high contributed articles, cross country collaboration, three field analysis, Co-words analysis and cluster mapping analysis were conducted.

Table 1: Methodology of the study

Main Information About Data	
Timespan	2001:2023
Sources (Journals, Books, etc)	590
Documents	1751
Annual Growth Rate %	22.38
Document Average Age	6.01
Average citations per doc	15.34
Document Contents	
Keywords Plus (ID)	1331
Author's Keywords (DE)	3927
Total Authors	3302
Authors Collaboration	
Single-authored docs	329
Co-Authors per Doc%	2.45
International co-authorships %	21.36
Document Types	
article	1561
book chapter	50
conference paper	66
review	74

Data Analysis and Interpretation

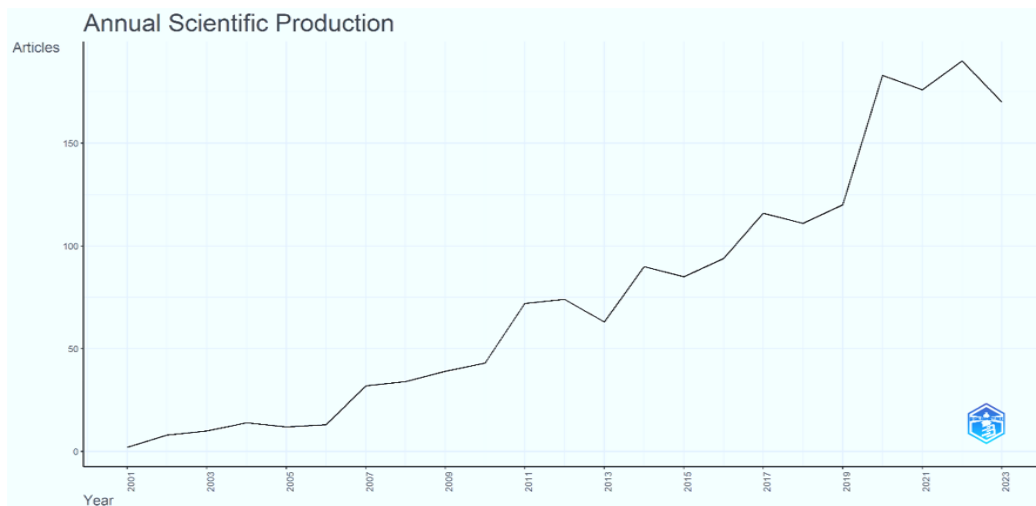


Diagram 1: Annual Scientific production of the Documents

Diagram 01 represents the number of articles published annually from 2001 to 2023. The pattern of the trend is generally growing, with rare deviations. The year with the most articles was 2020, with 183, followed by 2022, with 190. There was a significant increase of publications beginning in 2011. The year 2019 saw a big increase as well. However, compared to the previous year, there has been a modest reduction in the number of papers produced in 2023.

Table 2: Citation per Year

Year	Mean TC per Art	Total Publication	Mean TC per Year	Citable Years
2001	83.5	2.00	3.63	23
2002	92.62	10.00	4.21	22
2003	149.2	20.00	7.10	21
2004	55.64	34.00	2.78	20
2005	51.67	46.00	2.72	19
2006	75.46	59.00	4.19	18
2007	37.44	91.00	2.20	17
2008	33.06	125.00	2.07	16
2009	38.79	164.00	2.59	15
2010	30.23	207.00	2.16	14
2011	19.32	279.00	1.49	13
2012	24.39	353.00	2.03	12
2013	21.19	416.00	1.93	11
2014	27.89	506.00	2.79	10
2015	15.54	591.00	1.73	9
2016	13.31	685.00	1.66	8
2017	15.08	801.00	2.15	7
2018	13.14	912.00	2.19	6
2019	9.62	1032.00	1.92	5
2020	8.71	1215.00	2.18	4
2021	5.05	1391.00	1.68	3
2022	2.13	1581.00	1.06	2
2023	0.54	1751.00	0.54	1

The table 02 provides data on Mean Total Citations per Article (Mean TC per Art), the total number of articles (N), Mean Total Citations per Year (Mean TC per Year), and the number of Citable Years from 2001 to 2023. Mean TC per Art and Mean TC per Year are metrics measuring the average number of citations an article receives and the average number of citations per year, respectively. The word Citable Years refers to the length of time that a publication is still valid. The data show a general rising trend in citations, with notable oscillations, as well as an increase in Citable Years. This means that the published publications have had a long-term impact and relevance, demonstrating their persistent influence in the academic world.

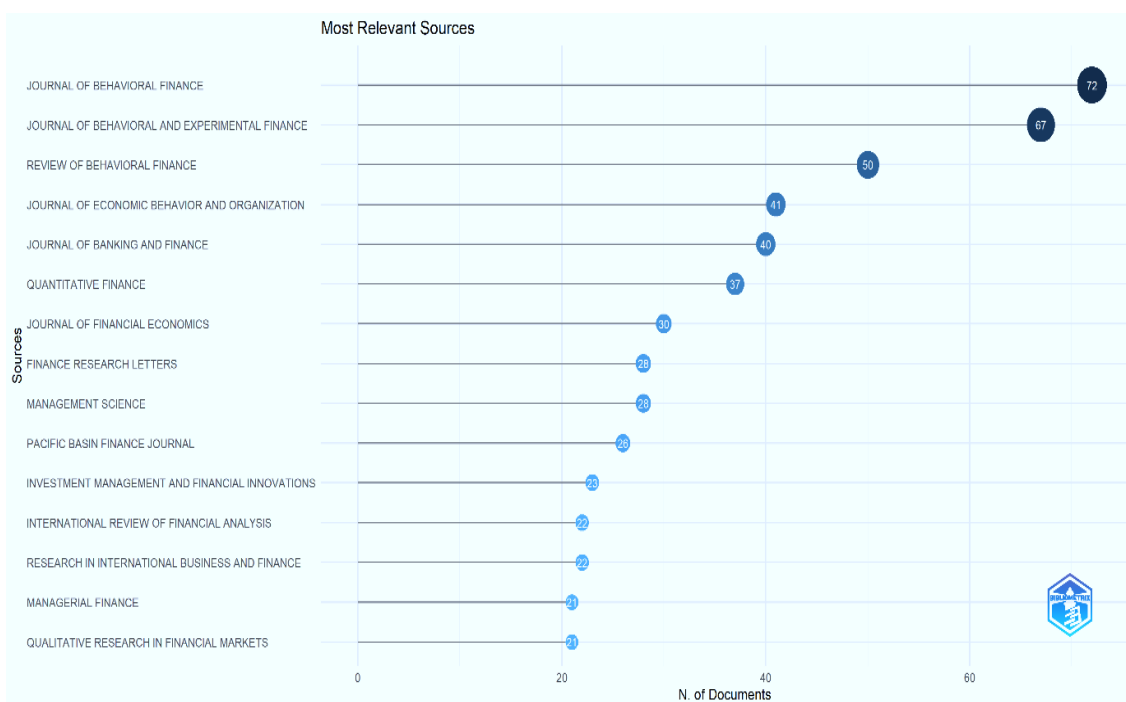


Diagram 2: Most Relevant Source

Diagram 02 shows the number of articles that have been published in various finance-related publications. The "Journal of Behavioural Finance" has the most papers (72), followed by the "Journal of Behavioural and Experimental Finance," which has 67. Other significant periodicals include "Journal of Economic Behaviour and Organisation," "Review of Behavioural Finance," and "Journal of Banking and Finance." These journals cover a wide range of topics, including classical finance ("Journal of Financial Economics") and more specialised fields like behavioural finance ("Journal of Behavioural Finance") and experimental finance ("Journal of Behavioural and Experimental Finance"). The distribution highlights the many different pathways for research and scholarship within the larger topic of finance.

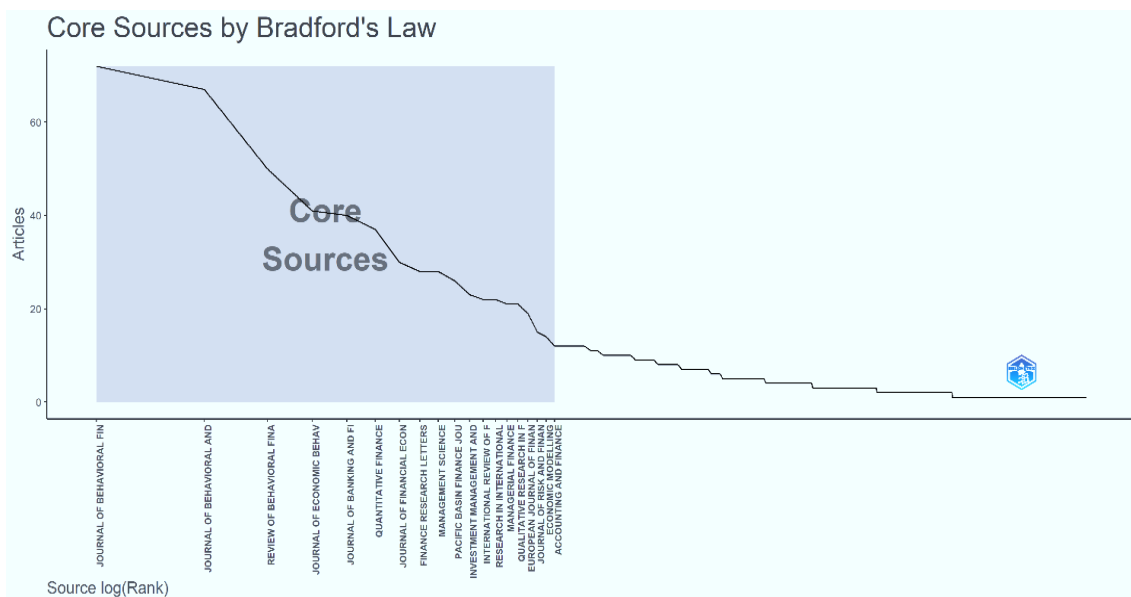


Diagram 3: Source relevancy by Bradfords Law

Diagram 03 shows journals according to the number of articles published. Journals such as "Journal of Behavioural Finance," "Journal of Behavioural and Experimental Finance," and "Review of Behavioural Finance" have the highest cumulative frequencies in Zone 1, showing their important contributions. Zone 2 includes journals such as "Applied Economics," "Cogent Economics and Finance," and "Journal of Economic Psychology." This classification provides insight into the distribution of publications throughout different zones, indicating the importance of specific journals in terms of frequency. It assists scholars and readers in discovering key journals within certain zones for targeted financial literature investigation.

Table 3: Most relevant Authors in the field of Behavioural Finance

Authors	Articles Published	Articles Fractionalized
KUDRYAVTSEV A	14	12.00
AHMAD Z	13	5.08
DURAND RB	10	3.42
HENS T	9	3.67
KUMAR S	9	3.08
YANG C	9	4.33
ZHANG Y	9	2.83
HIRSHLEIFER D	8	2.58
SZYSZKA A	8	4.92
TEOH SH	8	2.67

Table 03 presents a varied set of prolific writers and provides insights into their productivity as researchers and collaborative endeavours in the field. The "Articles Fractionalized" column shows the average fractionalized contribution per article. The fractionalized metric denotes the relative contribution of each author to each article. Remarkably, Ahmad Z comes in second with 13 articles, after Kudryavtsev A with 14. Kudryavtsev A, Ahmad Z and Szyszka A has the

greatest fractionalized count of (12.00), (5.08) (4.92) respectively followed by Yang C (4.33).

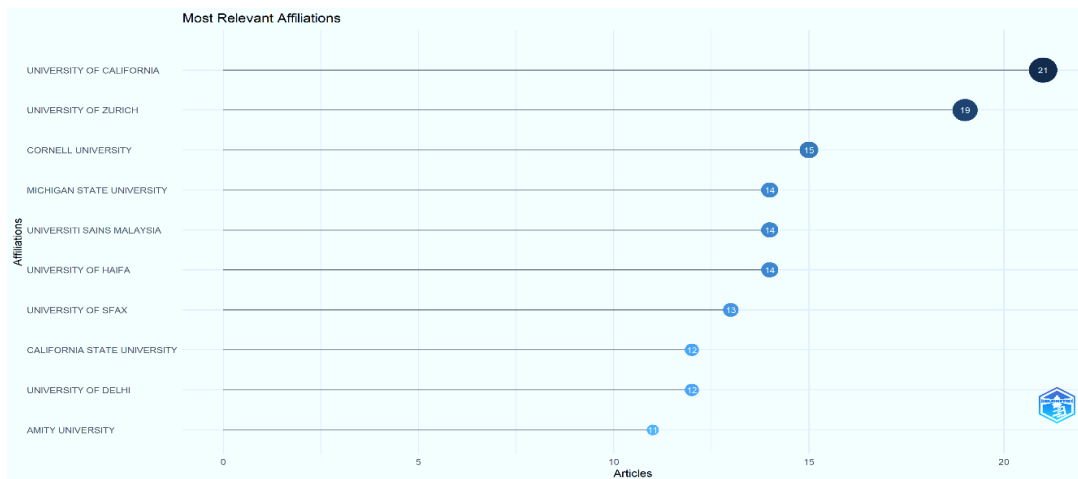


Diagram 4: Most Relevant institution contribution in the field of Behavioural Finance

Diagram 04 provides the glimpse of research output by affiliation, including the number of articles published. The University of California has the most articles (21), followed by the University of Zurich (19). Cornell University, Michigan State University, University Sains Malaysia, and the University of Haifa each contribute 15 or 14 articles. The list illustrates a global dispersion of research, with universities such as California State University, the University of Delhi, and Amity University represented. The diversity of affiliations reflects the broad academic environment and collaborative efforts across universities globally, all of which contribute to a rich and comprehensive body of research in a range of subjects.

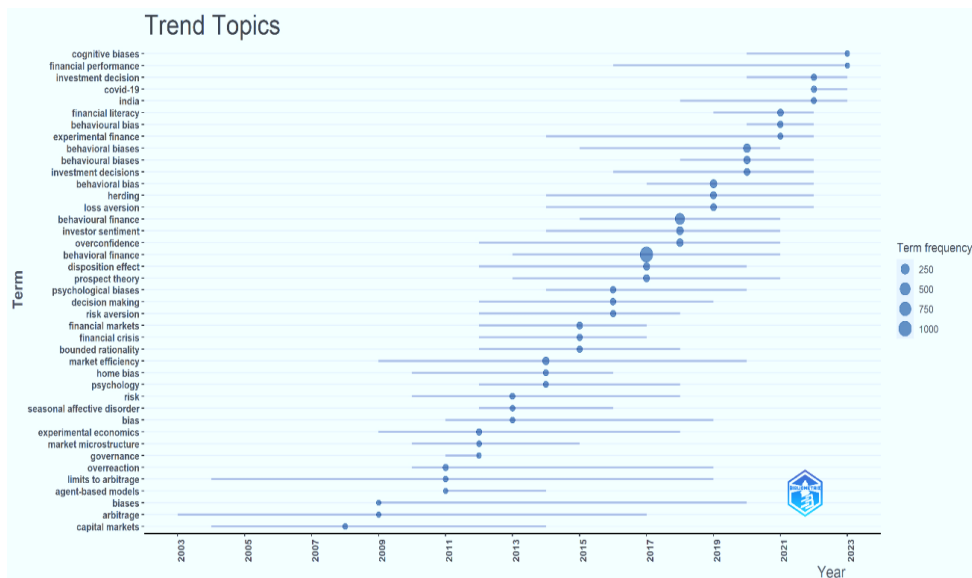


Diagram 5: Trending Topics

Diagram 05 reflects the most widely discussed topics in the behavioural finance field. Among the most popular topics in the field of behavioural finance include prospect theory, behavioural biases, investors' sentiment, overconfidence, behavioural biases, loss aversion, and market efficiency.

Table 4: Most relevant publications

Author	Title	TC	TC/Yrs	Review
(Peng & Xiong, 2006)	Investor attention, overconfidence and category learning	625	34.72	Study investigates how asset-price dynamics are shaped by psychological characteristics such as overconfidence, which in turn influences restricted investor attention. It emphasises behavioural components and offers insights into return predictability patterns in a range of market scenarios. It also indicates larger return correlations across firms than the fundamentals suggest.
(Abreu & Brunnermeier, 2003)	Bubbles and Crashes	510	24.29	This paper disproves the notion that rational arbitrageurs eradicate asset bubbles by putting forth a model in which the incapacity to coordinate sales leads to bubble persistence. Long-term variations are driven by psychological variables, such as opinion dispersion, which sustain bubbles notwithstanding arbitrage possibilities. The model highlights the influence of psychological factors on market dynamics by predicting information fads, self-feeding decreases, and overreactions.
(Hirshleifer & Teoh, 2003)	Herd Behaviour and Cascading in Capital Markets: a Review and Synthesis	456	21.71	Herd behaviour, reward interactions, social learning, and informational cascades in capital markets are all examined in this paper. The results emphasise idiosyncrasy, fragility, and path dependence while highlighting the frequency and fragility of herd behaviour. By incorporating informational influences, imperfect rationality, and reputational consequences, insights enhance behavioural finance theories.
(Xuan et al., 2013)	Tone Management	335	33.50	This study proposes anomalous positive tone (ABTONE) as a predictor of poor future profits by examining the strategic manipulation of tone in earnings press releases. Managers purposefully utilise tone to deceive investors by emphasising the psychological elements in financial reporting.
(Hirshleifer et al., 2004)	Do investors overvalue firms with bloated	332	16.60	This study looks at net operational assets (NOA) and finds that long-term stock returns are negatively predicted when

	balance sheets?			accounting value-added exceeds cash value-added. Due to their lack of attention, investors often overvalue these companies, illustrating the long-term impact of psychological influence.
(Daniel et al., 2002)	Investor psychology in capital markets: evidence and policy implications	327	14.86	examines how psychological biases influence investor behaviour, and it suggests minimally coercive methods, such as transparency rules, to improve market efficiency.
(Kaplanski & Levy, 2010)	Sentiment and stock prices: The case of aviation disasters	322	23.00	Due to media-induced anxiety and the resulting decline in demand for riskier assets, aviation disasters have a negative event effect on stock prices that is significantly greater than economic losses.
(Kearney & Liu, 2014)	Textual sentiment in finance: A survey of methods and models	289	28.90	Textual emotion, particularly negative phrases, has a major impact on stock returns and trading volumes, adding to human psychological effect. There are disagreements about projecting future trading volumes.
(Oechssler et al., 2009)	Cognitive abilities and behavioral biases	279	18.60	Using the Cognitive Reflection Test, links better cognitive abilities to fewer behavioral biases but highlights persistent biases, including anchoring.
(Malmendier & Shanthikumar, 2007)	Are small investors naive about incentives?	265	15.59	investigates how investors react to stock recommendations. Small investors take biased advice seriously, possibly due to a lack of awareness

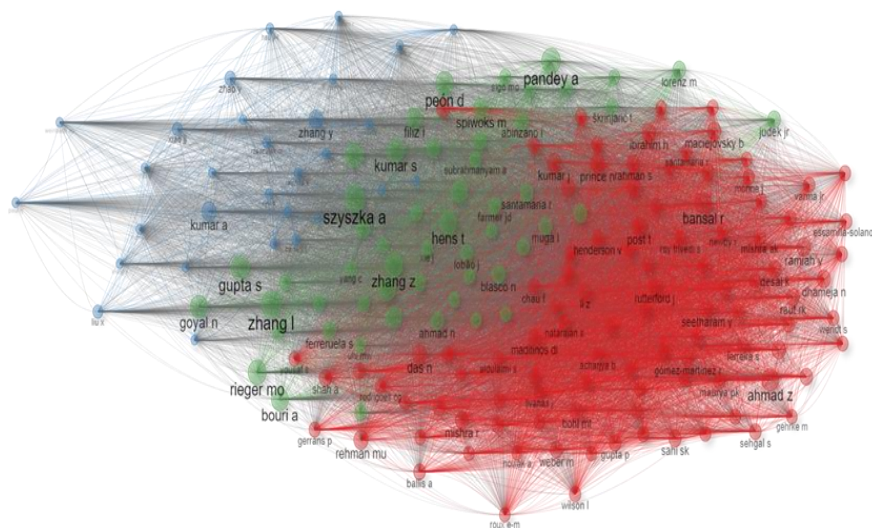


Diagram 6: Cluster Coupling by author

Diagram 06 depicts how authors are grouped according to three distinct methods of author collaboration. Three colour nodes—red, blue, and green—make up the cluster. The red cluster indicates a correlation between the author's study and the fields of behavioural finance, psychology, stock market, and investment. On the other hand, green is associated with cash flow, the stock market, and investments. The last colour, blue, stands for behavioural finance, investment, and behavioural research. The red cluster has a significant association when viewed in respect to other clusters, indicating the impact of behavioural finance and psychology on stock market investment.

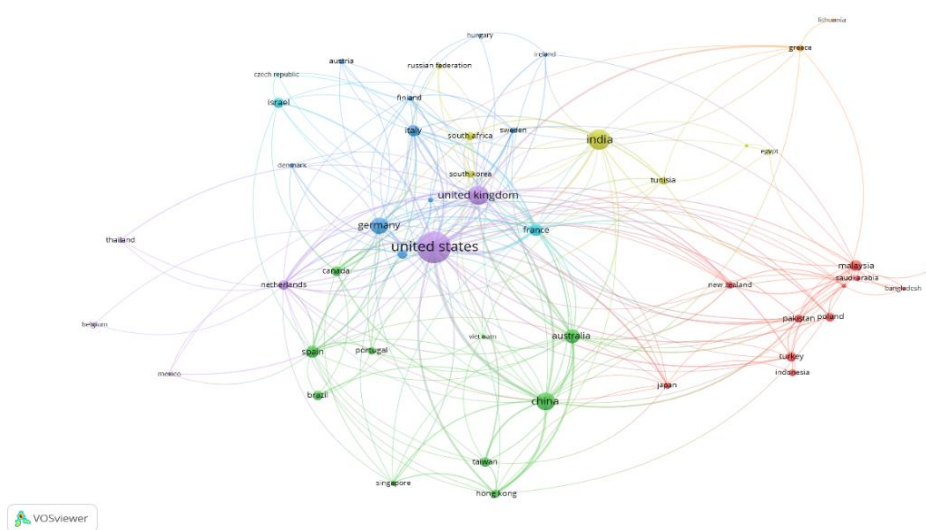


Diagram 7: Cross Country Collaboration

Diagram 07 shows unique clusters of international collaboration in research, the first notable cluster is led primarily by American academics features strong collaborations with researchers in Australia, Korea, Canada, Switzerland, China, Singapore, Brazil, and Malaysia. The associations between the UK, Switzerland, Spain, Ireland, Greece, Turkey, and New Zealand are highlighted in the second cluster. The third cluster is headed by France, which works closely with scientists in Tunisia, Italy, and Poland. A fourth sector shows collaboration between Malaysia, Saudi Arabia, Pakistan, New Zealand and turkey. A fifth, smaller group forms with Tunisia, India, south Korea and South Africa in it. This clustering illustrates the interwoven networks among academics from different nations, promoting international cooperation and knowledge exchange in a variety of academic areas. It also demonstrates the global character of joint research activities (Donthu et al., 2021).

Figure 09 Co-occurrence of keywords analysis is performed using co-occurrence as the kind of analysis and author keywords as the units of analysis using fractional counting. Only 200 of the 3928 keywords fulfil the criteria. The idea behind the fractional count technique of analysis is to reduce the impact of articles containing too many keywords (*Kashi & Shah, 2023*). Based on the interconnectedness of the words, the data set is separated into two primary clusters, which are highlighted in green and red. thickness of the dots represent a wider relation with other keywords. Behavioural finance appears with almost all of the terms, and the thickness of the link indicates a strong relationship between the words. Behavioural finance has a strong relationship with investor's sentiment, market efficiency, bounded rationality, stock market and asset pricing in this context. Where there is a poor relationship between investment decisions, financial markets, financial literacy, decision making, and mutual funds. This demonstrates that less research has been conducted to determine the relationship of behavioural psychology to these topics.

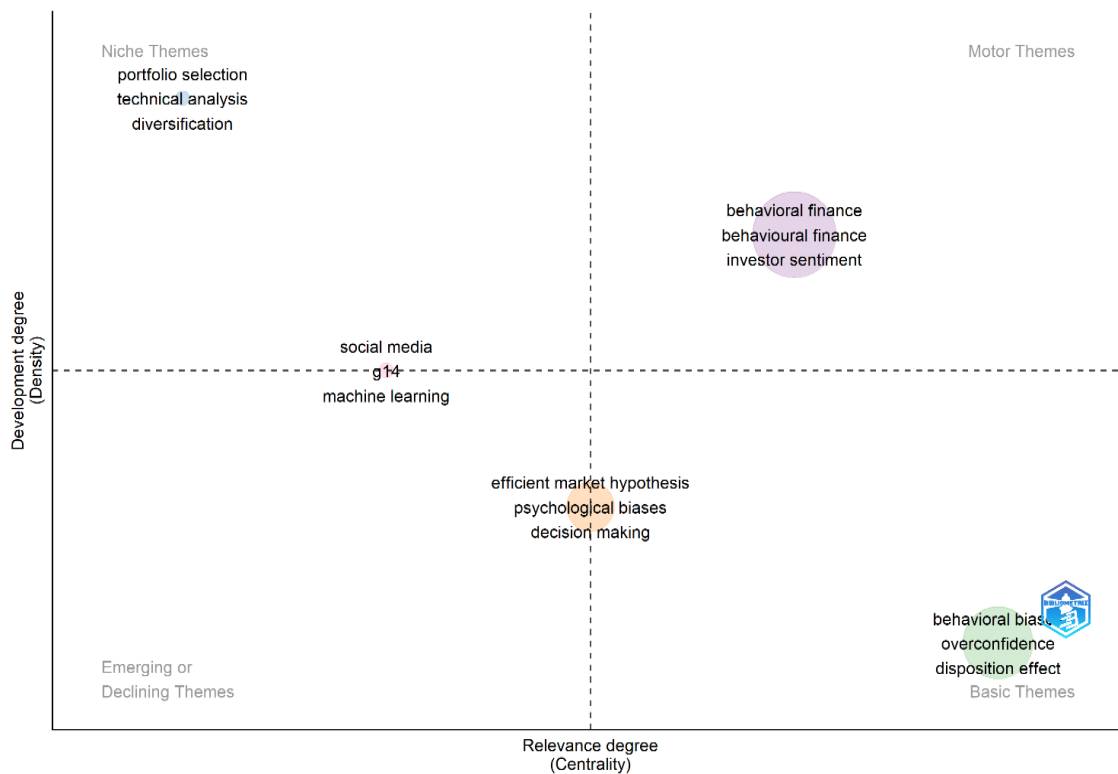


Diagram 10: Thematic Map

Diagram 10 Thematic evolution in the field examines the overall picture of the field's evolution across time by dividing the entire time frame into various time slices. Based on the density and centrality of keyword and field components, it guides the growth of the study area. Based on their density and centrality, these themes are arranged into four quadrants on a two-dimensional graph where the two variables are density and centrality (*Kraus et al., 2022*). "Behavioural finance and investor sentiment" is the most frequently discussed topic and the cornerstone of

the subject matter, with a high density and centrality in the upper right quadrant. A niche theme "portfolio selection, technical analysis and diversification" is indicated in the upper left quadrant indicate theme is well-developed internally but has poor external relations and is of secondary importance. The lower right quadrant's "Behavioural Biases, Overconfidence, and Disposition Effect" indicates a crucial yet Underdeveloped or basic sector. The lower left quadrant's topic, "Psychological biases and decision making," has been neglected and modest developed. It shows topics that are emerging (*Chang et al., 2015*), (*Župič & Čater, 2014*).

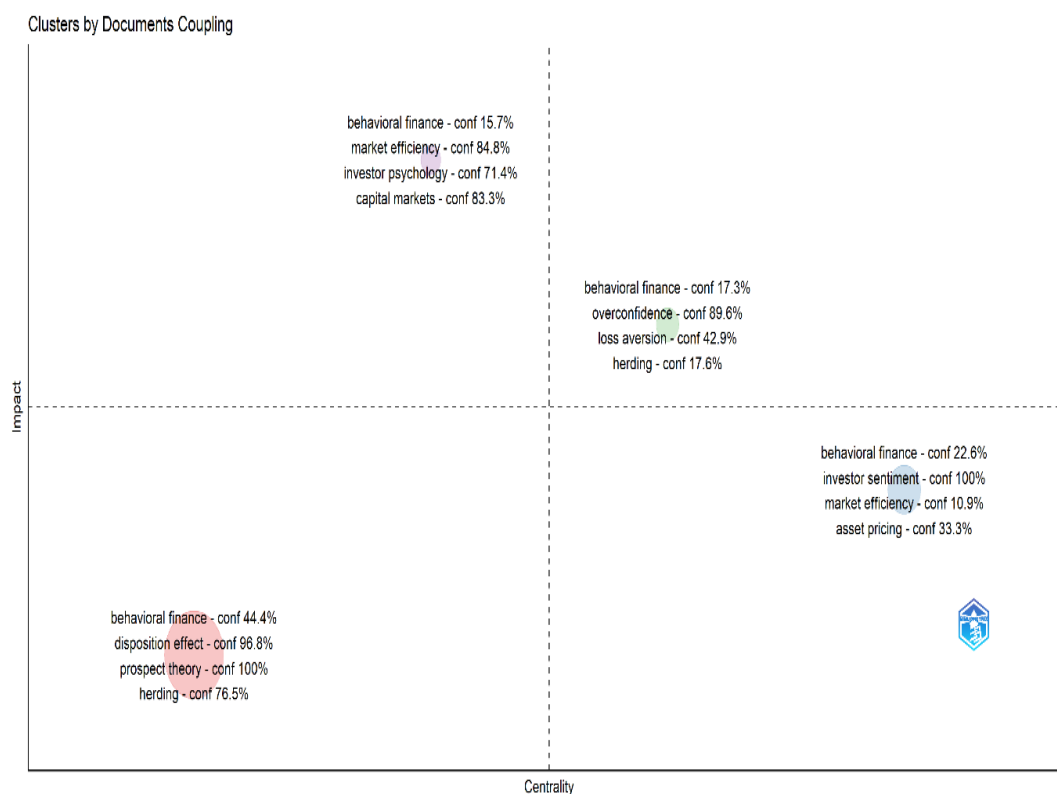


Diagram 11: Cluster by Documents Coupling

Diagram 11 showcase clusters that are found by co-word analysis. Based on their centrality and density on a two-dimensional graph where the two variables are centrality and density, these themes can be grouped into four quadrants. Based on its high density and centrality in the upper right quadrant, the motor subject "Behavioural finance, overconfidence, loss aversion and herding" forms the basis of the field and is the most discussed topic. A niche theme "market efficiency, investor psychology, and capital market" is indicated in the upper left quadrant. This theme is well-developed internally but has poor external relations and is of little significance. The lower right quadrant's "behavioural finance, investor sentiment, market efficiency, and asset pricing" indicates an important but Underdeveloped or basic field. In the lower left quadrant, "behavioural finance, disposition effect, prospect theory, and herding" is an underappreciated and hardly explored topic. It suggests that this is an emerging idea (*Župič & Čater, 2014*).

Major Finding

- The discipline of behavioural finance has experienced extraordinary growth since Kahneman's Nobel Prize.
- The data show an increasing trend in citations over time, with some variations, and an increase in Citable Years, which suggests long-lasting academic impact.
- Bradford's Law states that the journals "Journal of Behavioural Finance," "Journal of Behavioural and Experimental Finance," and "Review of Behavioural Finance" are significant sources in the field of behavioural finance.
- Kudryavtsev A, Ahmad Z, Durand Rb are the most prominent author in the field of behavioural finance.
- American academics features strong collaborations with researchers in Australia, Korea, Canada, Switzerland, China, Singapore, Brazil, and Malaysia.
- According to the results, there is a substantial relationship between asset pricing, bounded rationality, investor mood, market efficiency, and behavioural finance. It is noted that there is a weak correlation in domains such as financial literacy, financial instruments, and investment decision. This implies the need for additional study to fully grasp how behavioural psychology affects these subjects.
- Thematic map results indicate that the topics of "Psychological biases and decision making" has been underdeveloped or Emerging, while "Behavioural Biases, Overconfidence, and Disposition Effect" is an important yet Basic Theme area.
- Behavioural finance research, led by writers such as Hirshleifer D, Teo SH, and Zhangy, is predominantly performed in the United States, followed by Spain, China, Malaysia, and Israel. A significant data gap in India highlights the importance of researching the psychology of Indian investors.

Scope for Future Research

Behavioural finance has grown in prominence over the last two decades as a rising sector of finance. According to bibliometric data, the majority of research in this topic is undertaken in developed countries such as the United States, Spain, and China, emphasizing the need for research on the impact of behavioural psychology on Indian investors. According to the analysis, the bulk of studies examine how behavioural finance influence on development of investors sentiment and its subsequent effect on the market volatility, stock return, Assets pricing, over reaction to market trends and decision making by considering the single investment avenue i. e., stock. (*Kumar & Goyal, 2015*). There is relatively little study on the impact of psychological biases on investor sentiment and its implications on investment decision-making. To fill this gap, future research might investigate the impact of psychological biases on the formation of investor sentiment and its impact on investment decisions by considering alternate financial investment options such as mutual funds, derivative instruments, and exchange-traded funds. Additional research could look into the impact of different additional behavioural biases on investment decisions.

CONCLUSION

In the mid-1960s, a new generation of economists began challenging traditional financial theories, leading to the emergence of behavioral finance. This field suggests that investors aren't always rational; they can be quasi-rational or irrational when making decisions. This idea opened the door for further exploration into the psychology of investors in decision-making. While there has been significant research in behavioral finance over the past two decades, the continuous expansion of financial markets, offering various investment options for more studies. There is still a need to understand how psychological factors influence alternative financial investments such as mutual funds, derivative instruments, debt securities, and exchange-traded funds. So, this article aims to highlight potential future research directions in the field of behavioral finance.

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