Advances in Consumer Research
https://acr-journal.com/

Volume-2 | Issue-4 | September 2025

Original Researcher Article

Mapping Behavioural Biases in Investment Decisions: A Comprehensive Bibliometric Analysis

Ms. Pooja[1] and Dr. Pooja Gupta[2*]

[1]Research Scholar, School of Commerce & Business Management, Geeta University, Panipat, India,
Email: poojadabra75@gmail.com
[2*]Associate Professor, School of Commerce & Business Management, Geeta University, Panipat, India,
Email: pgpoojaguptamba85@gmail.com

Received:
04/08/2025
Revised:
19/08/2025
Accepted:
09/09/2025
Published:
26/09/2025

ABSTRACT

Purpose*:** The main purpose of the study is to assess the contributions of various research components such as authors, articles, and journals etc. and the relationship between them in the research field of behavioural biases. It also seeks to understand the conceptual framework and recognize potential future research directions. ***Design/ Methodology*:** A final dataset of 501 articles extracted from the SCOPUS database analyzed in the study. By using Biblioshiny and VOSviewer, performance analysis and network analysis techniques have employed, to assess contributions and to visualize concepts and highlight potential future research directions in the field of behavioral biases. ***Findings*:** Performance analysis reveals annual publication patterns, prominent authors, main affiliations, significant articles, leading journals, and top countries in behavioral biases research. Network analysis identifies four main themes, while co-word analysis recognizes future research prospects in the domain. ***Originality*:** The present study provides novel insights by mapping existing literature in the field of behavioral biases and offering new perspectives on its dynamics and implications. ***Research limitations and Future Direction – The limitation of the study is that the authors utilized only one database i.e. SCOPUS database, to regulate the outcome. Future research can be conducted using different or multiple databases. ***Practical Implications:*** The present study makes a significant contribution for individuals, the corporate sector and government regulators.

Keywords: Bibliometric analysis, Behavioural finance, Behavioural biases, Psychological Biases, Investor's behaviour, Investment decisions

INTRODUCTION

In the 1980s, a new approach called behavioural finance was introduced that combined psychology and finance. Generally, the behaviour of investors is characterized by a tendency to be influenced by various psychological factors such as human attitudes, emotions and biases which deviates them from making logical or rational decisions (Kapoor and Prosad, 2017). Behavioural finance includes the study of these psychological factors to comprehend the concept of irrationality in investor's choices (Jain *et al.*, 2020; Mushinada, 2020). Behavioral finance is defined by Yoong and Ferreira (2013) as the study of the engagement of investor behavior through psychological and emotional causes. It mainly concerns with the effect of emotional errors as well as cognitive biases on investment decisions. (Kahneman and Tversky, 1979; Kishor, 2020). By becoming aware of these biases, investors could better manage the risks associated with their investment choices, which could result in increased returns on their investments. (Waweru *et al.*, 2008, Agarwal *et al.*, 2016).

According to Dhingra *et al.*, 2024 the conventional theories explain two main ideas: market efficiency and investor rationality. They declare that markets are efficient, consisting all relevant information, and investors perform rationally by making systematic decisions after critically assessing the information available in market (Muhmd and Maheran, 2009; Kumar and Goyal, 2015; Zahera and Bansal, 2018). These theories have given widespread recognition in the past by researchers to understand the behaviour of investors and its influence on the financial market but, in the present market, these theories may not explain correctly the questions concerning the issues of the unexplained growth of the stock market and its crashes as well as multiple possible elements which bring ideas that are unpredictable. (Zahera and Bansal, 2018). These

theories have also disregarded the impact of human behaviour on investment decisions. (Jain *et al*., 2020).

In the pursuit of achieving the maximum degree of analytical accuracy in financial decision-making, it is paramount to address the limitations of traditional finance theories by incorporating some psychological and behavioral factors of the investors. (De Bondt and Thaler, 1995; Shiller, 1999). Thus, the emergence of behavioral finance as a new branch of finance which provides solutions and alternative methods to market anomalies addressing the psychological aspects of the investors.

The traditional utility theory of finance has been substituted with the Prospect theory of behavioral finance which signifies a drastic change from conventional to behavioral strategies (Kahneman and Tversky, 1979). Tversky and Kahneman (1974) claimed that psychological biases significantly influence the investment decision-making process in uncertain circumstances. The financial judgments of investors are significantly influenced by heuristics and cognitive biases, which often lead them to non-logical and non-rational choices (Niehaus and Shrider, 2014).

The study looks at the main areas and relationships between behavioral biases and investment decisions. This review study is a very important contribution to the behavioral finance research.

The main objective of the current review study is to provide answers to the following research questions:

1. What is the annual publication trend in research on behavioral biases and investment decisions?
2. Which countries, affiliations, and researchers are the leading players in the field of behavioral finance research involved in investment decision-making?
3. What can be considered as the leading articles and journals in the field of behavioral biases?
4. What is the conceptual framework the research seeks to understand regarding the behavioral issues related to the investment process?
5. What could be some of the areas of research in the future, which help to enrich and expand the comparative literature of the behavioral biases?

Sections 2 to 5 of this review study has been organized in following manner:

- Section 2 provides a summary of the existing literature on the topic.
- In Section 3, the data employed and the methodology pursued in the study will be outlined.
- The results and the discussion of the study are the main contents of Section 4.
- Lastly, Section 5 will highlight the main points, summarize the review, and future research suggestions, it will also cover possible implications of the study.

LITERATURE REVIEW:

The study of behavioral elements affecting investment decisions has been a well-known subject discussed in the research literature on behavioral biases in investment decision making. Numerous studies like Kahneman and Tversky, 1979 have identified certain common behavioral biases among investors, such as anchoring bias, availability bias, and representativeness bias, loss aversion and regret aversion, the disposition effect and home bias, as well as the overconfidence bias, heuristics, herding, and overconfidence have been labeled by Asad *et al.*, 2018; Baker *et al.*, 2019; Shah *et al.*, 2018.

Wolman, 1973 described the phenomena of cognitive biases "as the preferentiality of choice" by investors. Kalra & Arora, 2012 expressed the term "biases" as analytical insights of financial market patterns. While the biases were attributed to the rigorous decision makers that all investors make in times of uncertainty (Chen *et al*., 2007).

The research by Kim and Nofsinger, 2008 found that investors were also affected by behavioral as well as psychological biases, in addition to the market volatility and the profit opportunities. The study of Sahi, 2017 found out that expert bias, overconfidence bias, and self-control bias were the forces that positively affected the individual investors' behavior and their satisfaction with investments. The work of Chandra and Kumar, 2012 and Pompian, 2012 suggested that the herding and heuristics were significantly the part of investment decisions. The researchers Kengatharan and Kengatharan, 2014 also supported the statement that the anchoring biases, the herding bias, and the overconfidence bias positively correlated with the investors' behavior.

In the research done by Puaschunder, 2017, it was also stated that herding and heuristic biases are the reasons for positive influence of variable stock market performances. Fang *et al.*, 2017 and Shah *et al*., 2018 are relevant in this item as well. The study of Economou *et al.*, 2011 and that of Lao & Singh, 2011 showed that the investors followed decisions of the dominant group due to the herding bias, which significantly influenced stock market investments. According to Asad *et al*., 2018, the impact of herding behaviour is less impactful in developed markets but the opposite remains in developing markets.

Kahneman and Tversky, 1979; Rauf *et al*., 2018; Parveen & Siddiqui, 2018; Shrotryia & Kalra, 2021 pointed out the anomalies existing in the stock market and the meaningless decisions made by investors. This uninformed manner of investing does not solely affect the individual people but it can also endanger the economy and financial systems of the country (Ahmad *et al.*, 2017). Kumar and Goyal, 2015 and Costa *et al.*, 2019 in their study, targeted only particular biases so it is significant to explore the success of and the tie-up between the articles published relating with individual's behavioral biases.

Jain *et al*., 2020 reviewed 212 documents taken from the Scopus database, assessing the literature on the

influence of financial biases on behavior while Dhingra *et al.*, 2024 took advantage of the WOS database for their bibliometry studies. The current study is unique in a way that it is different from the previous two studies - Jain *et al.* (2020) and Dhingra *et al.* (2024) regarding the study of both the database and the number of articles studied. Considering in totality the total articles used in the current study which were 501 are more than double that of the articles (212) of Jain *et al.*, 2020 and the database (SCOPUS) utilized currently is different from the database (WOS) used by Dhingra *et al.*, 2024.

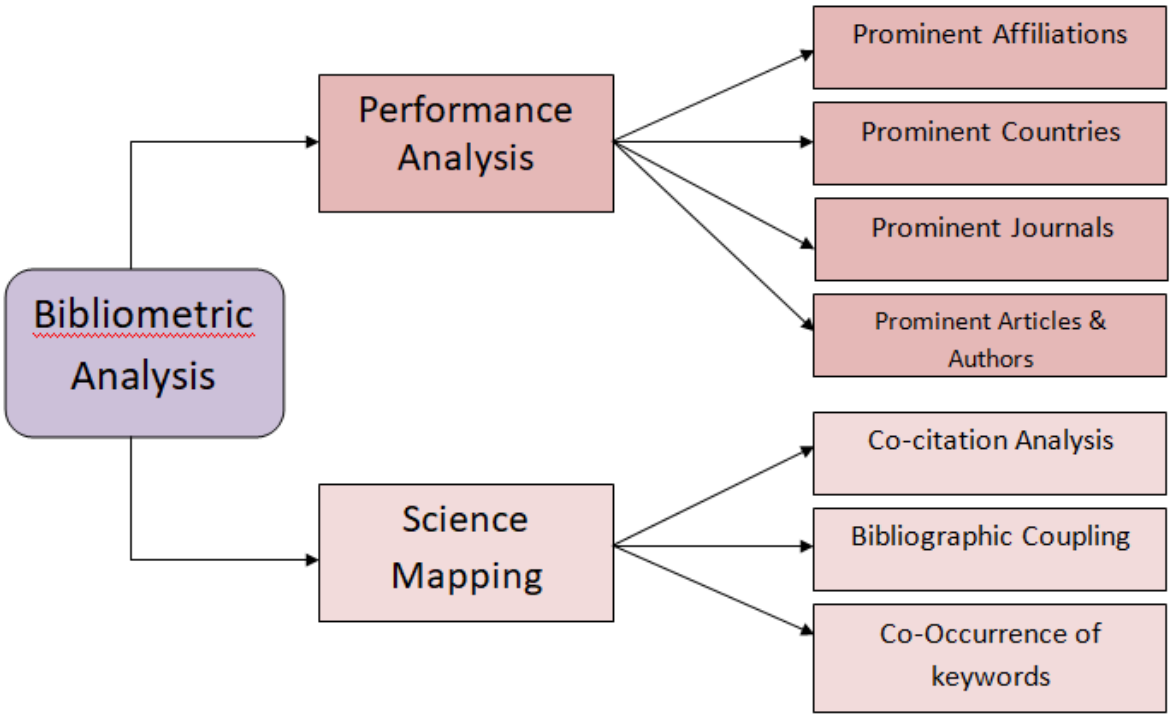
DATA AND METHODOLOGY

Method of Analysis

Bibliometrics is the method used in the evaluation of literature, which is concerned with the identification of highly-cited publications on the subject (Sassmanns hausen and Volkmann, 2013). The method forwards objectivity in to review of related literature by considering a large number of scholarly articles methodically. The current study employs performance analysis and science mapping techniques of bibliometric analysis as illustrated in Figure 1.

Co-citation analysis helps in mapping previous research, bibliographic coupling verifies the existing trends, while co-word analysis identifies the potential future directions of the research (Donthu *et al.*, 2021). These techniques also uncover thematic developments in the field over time. \

Figure 1: Structure of the Study



Source: Authors' Creation

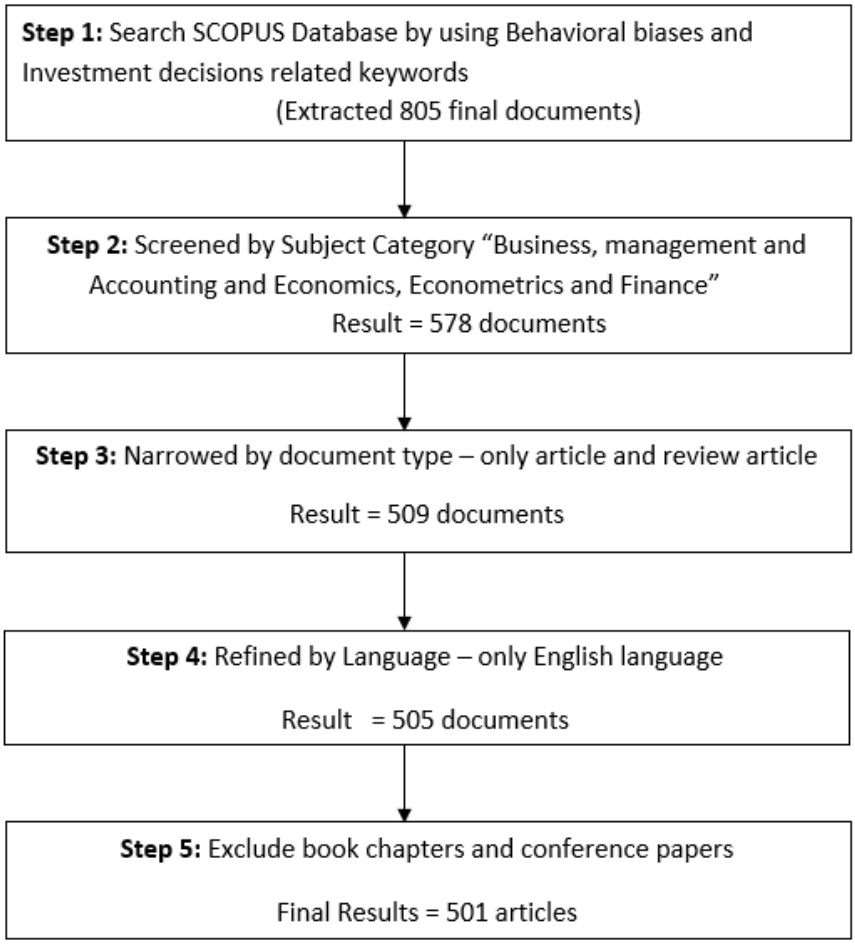
3.2 Data for the Study

The researchers choose to access SCOPUS database for statistical data while conducting this study because it presents an extensive collection of articles and related citations from an enormous geographical range. Initially, the database is searched by using keywords related to 'Behavioural biases and Investment decisions".

A total of 805 final documents were retrieved by using search string "Bias" or "Biases" or "behavioural biases" or "Cognitive Biases" or "Psychological Biases" or " Investor's Biases" and "Investment Decisions" or "Invest Behaviour" or "Investor's Behaviour" for the period of 1975-2023. The results shown that first publication related to Behavioural biases appeared in 1975. Following that, a series of inclusion and exclusion criteria was applied by the authors to select relevant publications.

First of all, screening was focused on the articles which were published within the domain of "Business or Business Finance or Management or Economics", reducing the total number of articles to 578, as shown in figure 2. The search was then limited to include only articles and review articles, resulting in 509 documents. Further, the search was refined to include only English-language articles, bringing the count to 505, excluded 4 additional articles were excluded, Subsequently, 4 more documents, identified as book chapters and conference papers excluded. Finally, 501 articles for the period of 1975-2023 used for review in this study as shown in Table I.

Figure 2: Bibliometric Review Search and Filtration Mechanism



Source: Authors' Creation

Table I: Descriptive data regarding scientific papers extracted from Scopus Database

Description	Results
Timespan	1975:2023
Sources (Journals, Books, etc)	282
Documents	501
Annual Growth Rate %	9.38
Document Average Age	7.26
Average citations per doc	20.16
References	25124

Source: Data extracted and analyzed using Biblioshiny

ANALYSIS AND FINDINGS

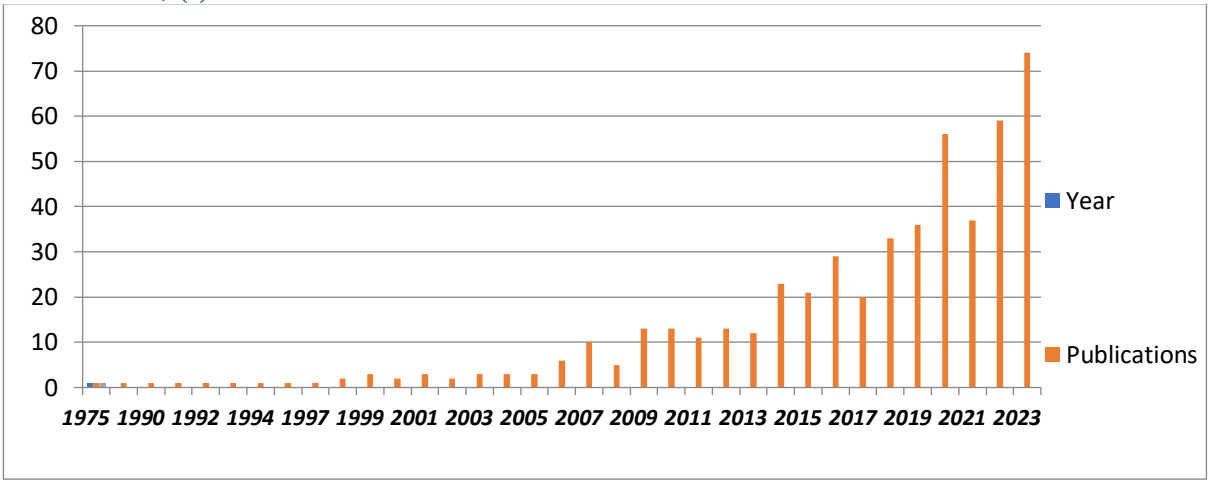
Annual Publication Patterns

The number of articles published in a specific field is a representation of the growth trends of scientific research. Figure 3 shows the annual publication patterns in the field of behavioral biases research, as documented between 1975 and 2023. The integration of psychological studies into economic models by economists in the 70s led to the start of behavioral research. The most crucial research in this area started in the 1990s.

Between 1975 and 1989, there were only 2 papers published on behavioral biases. The number of publications ranged from 0 to 10 per year between 1990 and 2008, which was a small number. Beginning in 2009, the curve has become much steeper, suggesting that among scholars, there is a great deal of concern for understanding global financial crisis issues from the investor's behavioral perspective.

After 2018, the rise of publications on behavioral biases has been notable. A total of 262 articles published from 2019 to 2023 covered 50% of the articles used in this study. In 2022, a total of 59 articles were published, and in 2023, a total of 74 articles were published in the subject area, implying the growing popularity of behavioral finance.

Figure 3: Annual Publication of research articles on Behavioural Biases



Source: Authors' Creation

Prominent Affiliations for Behavioural Finance Research

The 23 institutions/affiliations that have done most influential work in the field of behavioural biases are presented in the table II, which means they are the ones with the largest number of publications. The minimum cut-off value of 5 was established. The following institutions stood out first in the research of behaviour-related biases: Amity University, International Islamic University, and Sri Aurobindo College of Commerce and Management, all with 9 papers published each. Next are the University of Southampton and Open University, who were quite successful by each contributing 8 articles. After them, the other five universities that excelled in this domain are i.e. University Sains Malaysia, University of Pretoria, University of Sfax, University of Würzburg, and University School of Applied Management, all having published 7 articles each. As a whole, these top 23 affiliations/institutions account for 31.53% (158) of all articles within the given domain.

Table II: Prominent Affiliations in the field of Behavioural Biases

Name of Affiliation/University	Articles
Amity University	9
International Islamic University Malaysia	9
Sri Aurobindo College of Commerce And Management	9
The Open University	8
University of Southampton	8
Universiti Sains Malaysia	7
University of Pretoria	7
University of Sfax	7
University of Würzburg	7
University School of Applied Management	7
Comsats University Islamabad	6
Malaviya National Institute of Technology	6
National Institute of Technology	6
Tianjin University	6
University of St. Gallen	6
University of Technology Sydney	6
Zhejiang University	6
Makerere University Business School	5
University of California	5
University of Cambridge	5
University of Hyderabad	5
University of Prishtina "Hasan Prishtina	5
University of Reading	5

Source: Data extracted and analyzed using Biblioshiny

Prominent Countries

Table III highlights the top ten most impactful countries in behavioural finance as determined by the total citation count. The USA emerges at the top with 1866 citations, indicating that it has a major role in the field. India and Germany with 954 and 853 citations respectively are also recognized for their valuable contributions. With 212 articles published by the USA, it has been noted that the USA is the top country with the biggest number of articles, followed by India with

205 articles and the UK at 121 articles. Furthermore, other countries such as China and Germany play a considerable role.

Table III: Prominent Countries in the research on Behavioural Biases

Name of Country	No. of Articles	TC
USA	212	1866
India	205	954
Germany	89	853
United Kingdom	121	481
Canada	19	360
China	109	254
Pakistan	42	247
Australia	42	221
Malaysia	38	157
Italy	13	141

Source: Authors' creation & Data extracted using Biblioshiny

Prominent Journals

One of the main aims of finding which journals are the most powerful and productive ones is also to be able to comprehend what research is up-to-date and where it can be further developed. A table of significant journals in the research area of behavioral biases in investment decision making is reflected in Table IV. The top 20 journals have published 27.34% (137) of the total articles (501). The most prolific among these is the "Qualitative Research in Financial Markets" which has published 21 articles and second comes "Review of Behavioral Finance" with 16 articles. Both "European Journal of Finance" and "Journal of Banking and Finance Organization" published 10 articles each, putting them in the third spot.

The influence of these 20 journals on the field have examined on the basis of citations. 'Qualitative Research in Financial Markets' Journal demonstrates its significant influence with 689 citations. 'The Journal of Banking and Finance' is the second most influential journal with 324 citations. 'Journal of Behavioral Finance', 'Journal of Economic Behavior and Organization', 'Management Science', 'Review of Behavioral Finance', 'Energy Economics', 'the International Journal of Scientific and Technology Research', and 'Financial Management' are also prominent Journals with more than 100 citations. It emphasizes the importance of these journals in behavioural biases research field. Mostly journals hold "A*" or "A" ratings, indicating that prestigious journals are publishing research in this domain regularly.

Table IV: Prominent Journals in the domain of Behavioural Biases

No.	Journal Name	Articles	h Index	TC	PY Start
1	Qualitative Research in Financial Markets	21	13	689	2012
2	Review of Behavioral Finance	16	8	236	2010
3	European Journal of Finance	10	4	98	2015
4	Journal of Banking and Finance	10	7	324	2003
5	Journal of Behavioral Finance	8	6	208	2012
6	Cogent Economics and Finance	7	4	65	2014
7	International Review of Financial Analysis	7	5	70	2017
8	Investment Management and Financial Innovations	6	2	12	2007
9	Journal of Economic Behavior and Organization	5	4	113	1998
10	Management Science	5	4	136	2015
11	Managerial Finance	5	4	51	2017
12	Pacific Basin Finance Journal	5	3	69	2012
13	Energy Economics	4	4	176	2014
14	Financial Management	4	4	102	2008
15	Indian Journal of Finance	4	4	38	2014
16	International Journal of Bank Marketing	4	3	76	2010
17	International Journal of Housing Markets and Analysis	4	3	38	2017
18	International Journal of Scientific and Technology Research	4	2	122	2019
19	Journal of Applied Accounting Research	4	2	20	2016
20	Journal of Behavioral and Experimental Finance	4	3	41	2015

Source: Authors' creation & Data extracted and analyzed using Biblioshiny

Prominent Articles and Authors

Table V illustrates the most important articles along with their authors' names, arranged in order of their total citations. The most significant research paper in the study of biases in behavior is 'The Nature of Information and Overconfidence on Venture Capitalists' Decision Making' by Zacharakis and Shepherd (2016) which received 367 citations. In their study, they assessed the impact of overconfidence in relation to the nature of information on the decision-making of venture capitalists. The second most-cited article is the paper "Investor psychology in capital markets: evidence and policy implications' by Daniel et al. (2002), which has 351 total citations. They conducted a study and were able to show that psychological biases influenced investor behavior which had an effect on market price. In the third position, the research paper 'Overconfidence and trading volume' by Glaser and Weber (2007) is the one that studied the overconfidence and its effects on trading volume. The article was cited 342 times and it is the third-most influential paper based on these citations. Zacharakis and Meyer (1998), followed by 325 citations for the article 'A Lack of Insight: Do Venture Capitalists really understand their own Decision Process?', are of 4th rank. The authors were primarily concerned with the comprehension of the venture capitalists' decision-making process. Chen et al. (2007) also investigated the investment decision-making in the study 'Trading Performance, Disposition Effect, Overconfidence, Representativeness, and Experience of Emerging Market Investors', where the authors collected data from the Chinese investors and discovered that the investment decisions of those Chinese were influenced by the overconfidence, representative, and disposition effects, which were considered the three main kinds of biases. This study ranked as the fifth most influential article with 319 citations. The top 20 most influential articles by the total number of citations are shown in Table V.

Table V: Prominent Articles and Authors in Behavioural Biases Research

Authors	Title	Total Citations
Zacharakis, 2016	The nature of information and overconfidence on venture capitalists' decision making	367
Daniel *et al*., 2002	Investor psychology in capital markets: evidence and policy implications	351
Glaser and Weber, 2007	Overconfidence and trading volume	342
Zacharakis, 1998	A Lack of Insight: Do Venture Capitalists really understand their own Decision Process?	325
Chen *et al*., 2007	Trading Performance, Disposition Effect, Overconfidence, Representativeness Bias, and Experience of Emerging Market Investors	319
Forlani and Mullins, 2000	Perceived Risks and Choices in Entrepreneurs' New Venture Decisions	311
SEO and Barrett, 2007	Being Emotional during Decision Making—Good or Bad? An Empirical Investigation	204
Daniel and Titman, 1999	Market Efficiency in an Irrational World	186
Fraser *et al*., 2015	What do we know about entrepreneurial finance and its relationship with growth?	174
Kumar and Goyal, 2015	Behavioural biases in investment decision making – a systematic literature review	147
Anderson *et al.*, 2011	Cultural Influences on Home Bias and International Diversification by Institutional Investors	132
Cao *et al*., 2013	Can hedge funds time market liquidity?	129
Guenther *et al*., 2018	Is the crowd sensitive to distance?—how investment decisions differ by investor type	117
Joghee *et al.*, 2020	Decisions Effectiveness Of FDI Investment Biases At Real Estate Industry: Empirical Evidence From Dubai Smart City Projects	115
Murnieks *et al*., 2011	'I Like How You Think': Similarity as an Interaction Bias in the Investor–Entrepreneur Dyad	114
Pikulina *et al.*, 2017	Overconfidence and investment: An experimental approach	110
Sunak and Madlenar, 2016	The impact of wind farm visibility on property values: A spatial difference-in-differences analysis	108
Bennouna *et al.*, 2010	Improved capital budgeting decision making: evidence from Canada	100
Alkaraan and Northcott, 2006	Strategic capital investment decision-making: A role for emergent analysis tools?: A study of practice in large UK manufacturing companies	100
Zahera and Bansal, 2018	Do investors exhibit behavioral biases in investment decision making? A systematic review	96

Source: Authors' creation and Data analyzed by using Biblioshiny

Conceptual View

The themes that arise from network analysis provide an understanding of the theoretical perspectives of behavioral biases. Co-citation analysis, bibliographic coupling, and co-word analysis as science mapping techniques assisted-reviewing-based examination of the past, present, and future of behavioral biases and investor activities. The methods used in identifying these themes include:

Co-citation analysis

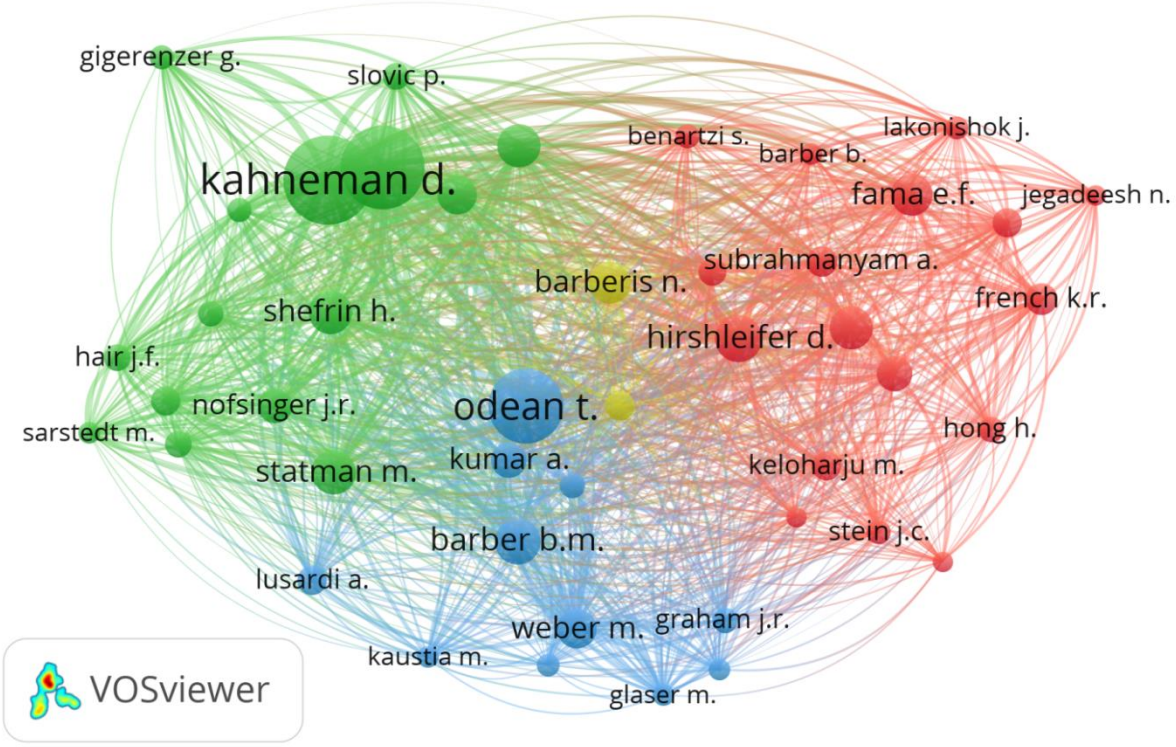
Co-citation analysis is a methodology rooted in the notion that most of the articles cited by others are those that highlight the same issue (Hjørland, 2013). For this

reason, two publications can be considered interrelated as long as they are present in the references of another paper. By using this technique, researchers can discover the articles that substantially contribute to the field of study as well as the clusters of related themes by examining the literature intersections obtained through co-citation.

Co-cited Authors

In a co-citation analysis network of authors, the minimum citation threshold initially was set to a default value of 20. Only 215 authors out of the 27405 authors could match this condition, so it was quite a selective process. However, because of this huge number of authors, the visualization background turned out to be very messy. Therefore, the point of the threshold increased to 50 citations, which refined the set of authors to only 45 which were spread out evenly among four clusters with 974 links and the total link strength totaling 59,875. In the case of Figure 4, the depicted co-citation network of authors was the result of VOS viewer.

Figure 4: Co-citation of authors



Source: Authors' creation using VOS viewer

Table VI: Top Ten Co-cited Authors

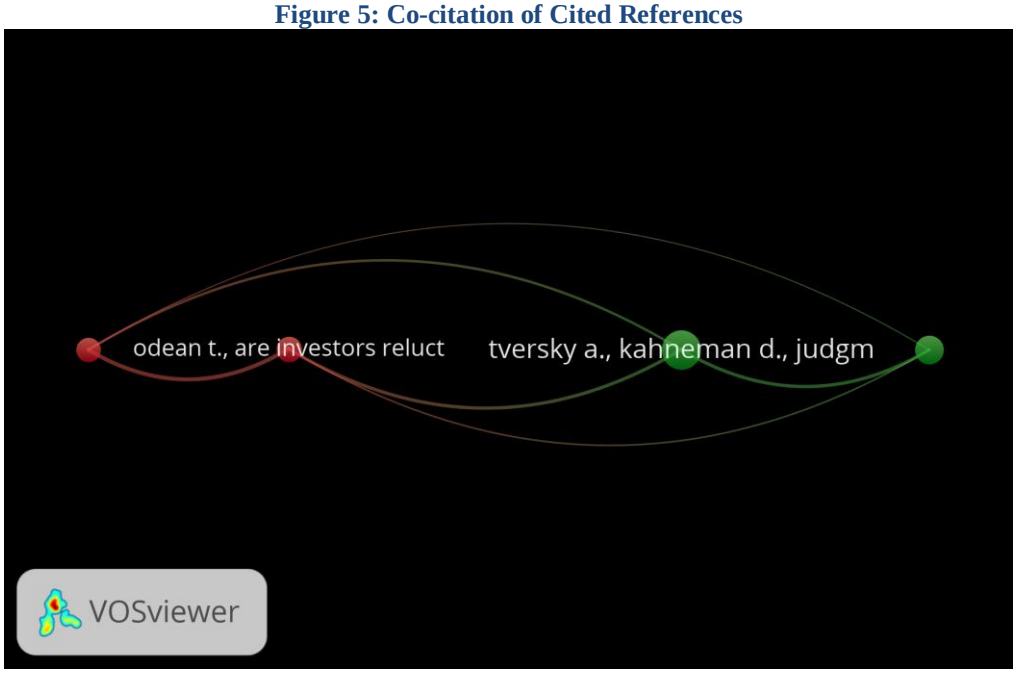
Name of Authors	Cluster	Citations	Links	Total Link strength
Terrance Odean	3	418	44	9640
Amos Tversky	2	501	44	8913
David Hirshleifer	1	196	44	4982
Brad M. Barber	3	188	44	4680
Richard H.Thaler	2	170	44	3990
Meir Statman	2	176	44	3937
Hersh Shefrin	2	170	44	3712
Andrei Shleifer	1	171	44	3568
Eugene F. Fama	1	157	44	3531
Martin Weber	3	147	44	3422

Source: Authors' creation and data extracted using VOS viewer

Co-citation of cited References

In network analysis of co-cited references, the minimum citations of cited references are set as the default value of 20 citations. Out of 25,003 authors, only 5 references meet this threshold; of which only 4 items are connected with each other. There are 2 clusters and 4 items with 6 links and 36 total link strength in total. Sherfin has 20 links with 18 total link strength, Odean has 22 citations and total link strength of 22 while Tversky & Kahneman have 45 citations with 21 total link strength. The resulting image of co-cited references using VOSviewer has been shown in figure 5:

Figure 5: Co-citation of Cited References



Source: Authors' creation using VOS viewer

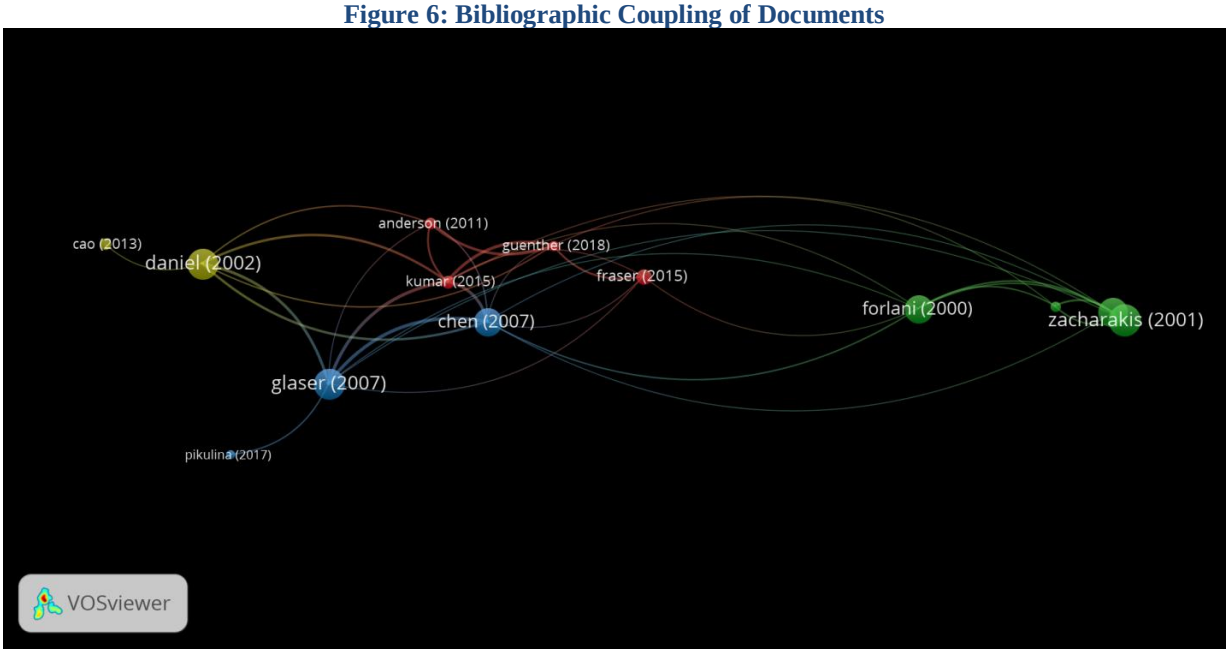
Bibliographic Coupling

Bibliographic coupling of documents, sources, authors, organization, and countries occurs when references from two publications are found to be common in another research paper (third one). This analysis uncovers the latest developments and emerging themes which provide a depiction of the present of a research field (Donthu *et al.* 2021). To spot the connection between documents, authors, organization and countries, bibliographic coupling has done and results of which are shown below.

Bibliographic Coupling of Documents

Figure 6 represented the bibliographic coupling of documents based on citation where 100 citations were set as a minimum threshold. Only 19 documents met this threshold, out of which 13 documents were interconnected. There are 4 clusters in total, cluster 1 (Red Colour) consists of Anderson (2011), Fraser (2015), Guenther (2018), and Kumar (2015). Cluster2 (in green) incorporates Forlani (2000), Murnieks (2011), Zacharakis (1998 & 2001), while cluster 3 in blue colour have 3 items i.e. Chen (2007), Glaser (2007), Pikulina (2017). The cluster in yellow Colour consists of only 2 documents namely Cao (2013) and Daniel (2002). Kumar (2015) has 147 citations with highest total link strength (41) while Zacharakis (2001) have highest citations with 26 total link strength.

Figure 6: Bibliographic Coupling of Documents

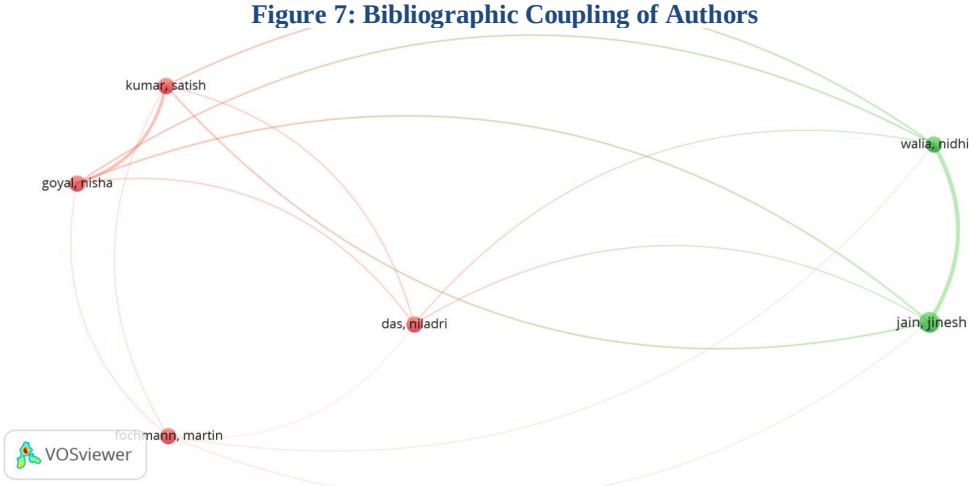


Source: Authors' creation using VOS viewer

Bibliographic Coupling of Authors

Figure 7 illustrated bibliographic coupling between co-authors. The threshold limit of the minimum number of documents of an author has set as 4 documents. Only 6 authors meet this criterion. There are 2 stand-alone clusters in total. The first cluster (marked with red color) included author Niladri dass, Martin frochmann, Nisha goyal, and Satish kumar. In this case, Nisha goyal and Satish kumar managed to collect 263 citations by having 4 documents and 616 total link strength; on the other hand, Niladri das has completed 4 documents with 63 citations and a total link strength of 167 & Martin frochman able to get 4 documents with 23 citations and strength of the link of 48 between total. The second cluster has only two members: Jinesh Jain with 5 documents with 150 citations and 898 total link strength and Nidhi Walia with 4 documents with 130 citations and an overall total of 891 link strength.

Figure 7: Bibliographic Coupling of Authors

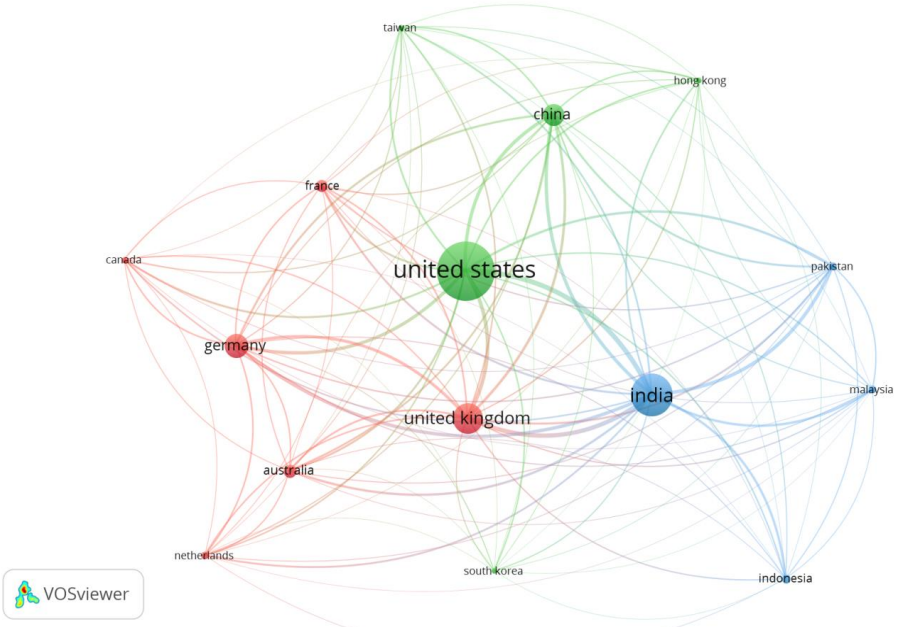


Source: Authors' creation using VOS viewer

Bibliographic Coupling of Countries

Figure 8 exhibits three groups of countries. The first one, which is shown to be red, contains six countries: Australia, Canada, France, Germany, the Netherlands, and the United Kingdom. The second cluster, marking in green, involves five countries: China, Hong Kong, South Korea, Taiwan, and the US. The third cluster, characterized by the color blue, is represented by four countries: India, Indonesia, Malaysia, and Pakistan. India published 79 papers, which in turn got 1,131 citations and has achieved a total of 16,548 of link strength. The USA authored 109 articles with 4,179 citations and had a link strength of 13,786. The United Kingdom had 56 papers, which was accompanied by 1,146 citations and a total link strength of 10,546. China released 40 papers with 667 citations and a link strength of 8,024, while Germany wrote 45 papers with 1,104 citations and a total link strength of 7,582.

Figure 8: Bibliographic Coupling of Countries

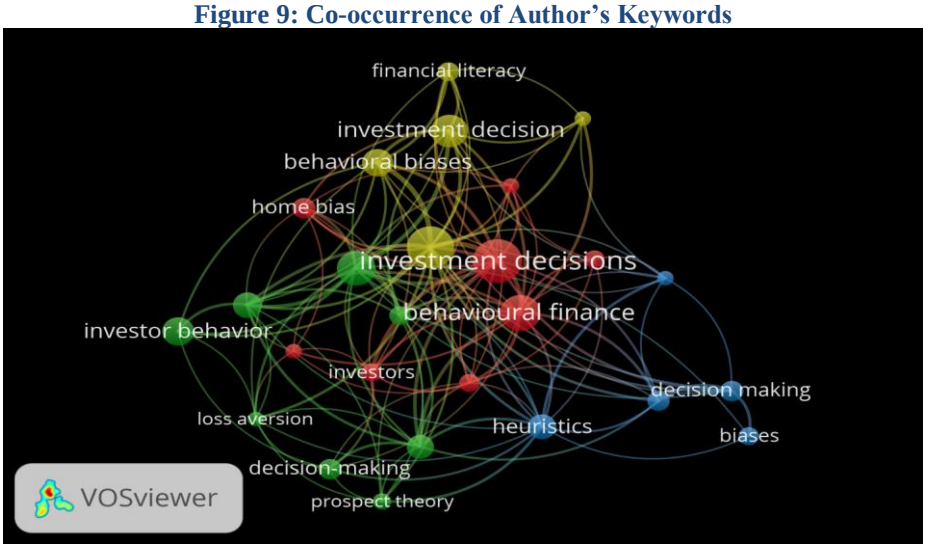


Source: Authors' creation using VOS viewer

Co-Occurrence of Author's Keywords

In the co-word analysis, "word" is the analysis unit. It helps in the interpretation of the thematic clusters derived from the bibliographic coupling or co-citation analysis because of the similarities found in various publications (Chang *et al*., 2015). The technique of co-word analysis can be employed as a tool for the forecasting of the potential development of future research in the field. Initially, similar keywords have been combined in the network analysis of co-occurrence of keywords. Then, threshold value of the frequency of occurrence of keywords has been set to the default value of five. 54 keywords out of the list of 1425 keywords meet the stated criteria. However, with 54 keywords, the resulting image is very cluttered. However, setting of higher value for a minimum occurrence of keywords results in few keywords only. Therefore, the threshold limit of minimum occurrence was set at 8 keywords finally for best results which provide 26 keywords, 4 clusters, and 138 links with total link strength of 285. The resulting image of co-occurrence of keywords using VOS viewer has been shown in figure 9.

Figure 9: Co-occurrence of Author's Keywords



Source: Authors' creation using VOS viewer

Table VII: Co-occurrence of Keywords using VOSviewer

Keywords	Frequencies	Total Link Strength
Behavioral finance	44	57
Investment decisions	47	54
Overconfidence	31	49
Behavioural finance	34	42
Disposition effect	20	31
Behavioral biases	22	30
Investment decision	29	30
Behavioural biases	17	29
Heuristics	18	28
Herding	12	21
Investments	13	19
Decision making	14	17
Investors	11	17
Stock market	11	16
Financial literacy	12	14
Home Bias	14	14
Loss aversion	8	13
Decision – making	14	12
Investor behavior	23	12
Psychological biases	8	12
Cognitive bias	8	11
Cognitive biases	8	11
Prospect theory	9	11
Behavioural bias	8	8
Investment decision making	11	7
Biases	11	5

Source: Authors' creation & Data extracted using VOS viewer

Various themes that emerged from above network map present the conceptual framework of behavioral biases as mentioned below:

Cluster 1: Behavioral Biases and Investment Decisions
Cluster 1 is shown in red color. The main author's keywords in this cluster are "behavioural bias", "behavioural finance", "cognitive bias", "home bias", "investment decision making", "investment decisions", "investors" and "stock market." Behavioural finance is a discipline to study the influence of psychology on financial decision-making and financial markets (Shefrin 1999).

Cluster 2: Behavioral Biases and Their Impact on Investor Behavior
Cluster 2 presents the various behavioural biases which influence investor's behaviour. The main keywords in this cluster are "behavioural biases", "decision making", "disposition effect" "herding" "loss aversion" "overconfidence" "prospect theory" and "investor behavior". Prospect theory explains various mental situations which influence investment decision-making such as mental accounting, loss aversion and regret aversion.

Cluster 3: The Role of Cognitive Biases and Heuristics in Investment Decisions
Cluster 3 is shown in blue colour. The main keywords in this cluster are "biases", "cognitive biases", "decision making", "heuristics" and "investments". It examines the role of heuristics and cognitive biases in investment decision making. Heuristics and cognitive biases are the two main pillars of behavioral finance.

Cluster 4: Financial Literacy and Its Relationship with Psychological Biases in Behavioral Finance
Cluster 4 is a group of concepts including keywords like "behavioral biases", "behavioral finance", "financial literacy", "investment decision" and "psychological biases". Behavioural biases exhibit a stronger relationship with financial literacy. (Gerth *et al.*, 2021).

Findings
The present study explores the components of research such as authors, articles and journals and the relationship between them in the research field of behavioral biases through performance analysis and science mapping which are properly defined through bibliometric analysis. The current investigation results clearly support the argument that after 2018, behavioral bias publications experienced massive growth. Amity University, International Islamic University, Malaysia and Sri Aurobindo College of Commerce and Management are the leading institutions in research on behavioural biases by contributing 9 articles each. The most powerful country in this field is the USA with 1866 citations. The results section sheds light on the most productive journals in the research area as well. The leading journal namely "Qualitative Research in Financial Markets" published the maximum number of research papers (21). Upon measuring the major research paper by the number of citations, 'The Nature of Information and Overconfidence on Venture Capitalists' Decision Making' by Zacharakis and Shepherd (2016) is confirmed to be the one most cited, having a total of 367 citations.

A co-word analysis examined 26 keywords within 4 clusters. The keyword co-citation analysis identified four main themes. They are: investment decisions accompanied by behavioral biases, the impact of behavioral biases on investor behavior, the role of biases and heuristics, and the linkage between financial literacy and psychological biases. The application of these techniques offered a better way to understand the information regarding this domain.

CONCLUSION

In the last several years, the research on behavioral biases became a specific source of explaining the behavior of investors and the anomalies of the financial market. This literature review enhances the existing literature on behavioral biases and investment decisions via a bibliometric analysis. This bibliometric analysis brings to light the rapid development and significance of behavioral finance research. It identifies significant publications, authors, and partnerships while signaling the growing interdisciplinary avenues. This research lays out a route for future research that highlights too little studied aspects and practical uses, providing a handy reference for the advancement of the subject area.

Future Prospectus
Authors utilized data up to 2023 and exclusively from only one database i.e. SCOPUS database to regulate the outcome. In the forthcoming times, research can be undertaken by employing multiple databases and including articles that are published in 2024 onwards for a more in-depth analysis. Future research can also be conducted by using combination of two or more review methodology for better understanding and a more detailed study.

Practical Implications
The study contributes valuable insights to the field of behavioral finance and has far-reaching implications for individuals, businesses, and government regulators. By recognizing cognitive errors and emotional effects, investors are enabled to adopt more rational decision-making processes resulting in trouble-free risk management and effective strategy implementation. Companies can offer personalized advice and design products that address biases. Government regulators or policymakers could draw reforms or the laws to educate investors on how to prevent hasty decisions and how to curb market turbulence. In short, recognizing the consequences of human behavior on investment decisions helps not only individuals but also the entire financial system by bringing greater stability and integrity.

REFERENCES

1. Agarwal, A., Verma, A., & Agarwal, R. K. (2016). Factors influencing the individual investor decision

making behavior in India. *Journal of Applied Management and Investments*, *5*(4), 211-222.
2. Ahmad, Z., Ibrahim, H., & Tuyon, J. (2017). Institutional investor behavioral biases: syntheses of theory and evidence. *Management Research Review*, *40*(5), 578-603.
3. Alkaraan, F., & Northcott, D. (2006). Strategic capital investment decision-making: A role for emergent analysis tools?: A study of practice in large UK manufacturing companies. *The British Accounting Review*, *38*(2), 149-173.
4. Anderson, C. W., Fedenia, M., Hirschey, M., & Skiba, H. (2011). Cultural influences on home bias and international diversification by institutional investors. *Journal of Banking & Finance*, *35*(4), 916-934.
5. Asad, H., Khan, A. A. T. I. Q. A., & Faiz, R. A. F. I. A. (2018). Behavioral biases across the stock market investors. *Pakistan Economic and Social Review*, *56*(1), 185-209.
6. Baker, H. K., Kumar, S., Goyal, N., & Gaur, V. (2019). How financial literacy and demographic variables relate to behavioral biases. *Managerial Finance*, *45*(1), 124-146.
7. Barber, B. M., & Odean, T. (2013). The behavior of individual investors. In *Handbook of the Economics of Finance* (Vol. 2, pp. 1533-1570). Elsevier.
8. Bennouna, K., Meredith, G. G., & Marchant, T. (2010). Improved capital budgeting decision making: evidence from Canada. *Management decision*, *48*(2), 225-247.
9. Bihari, A., Dash, M., Kar, S. K., Muduli, K., Kumar, A., & Luthra, S. (2022). Exploring behavioural bias affecting investment decision-making: a network cluster based conceptual analysis for future research. *International Journal of Industrial Engineering and Operations Management*, *4*(1/2), 19-43.
10. Cao, C., Chen, Y., Liang, B., & Lo, A. W. (2013). Can hedge funds time market liquidity?. *Journal of Financial Economics*, *109*(2), 493-516.
11. Chandra, A., & Kumar, R. (2012). Factors influencing Indian individual investor behaviour: Survey evidence.
12. Chang, Y. W., Huang, M. H., & Lin, C. W. (2015). Evolution of research subjects in library and information science based on keyword, bibliographical coupling, and co-citation analyses. *Scientometrics*, *105*, 2071-2087.
13. Chen, G., Kim, K. A., Nofsinger, J. R., & Rui, O. M. (2007). Trading performance, disposition effect, overconfidence, representativeness bias, and experience of emerging market investors. *Journal of behavioral decision making*, *20*(4), 425-451.
14. Costa, D. F., Carvalho, F. D. M., & Moreira, B. C. D. M. (2019). Behavioral economics and behavioral finance: A bibliometric analysis of the scientific fields. *Journal of Economic Surveys*, *33*(1), 3-24.
15. Daniel, K., & Titman, S. (1999). Market efficiency in an irrational world. *Financial Analysts Journal*, *55*(6), 28-40.
16. Daniel, K., Hirshleifer, D., & Teoh, S. H. (2002). Investor psychology in capital markets: Evidence and policy implications. *Journal of monetary economics*, *49*(1), 139-209.
17. De Bondt, W. F., & Thaler, R. H. (1995). Financial decision-making in markets and firms: A behavioral perspective. *Handbooks in operations research and management science*, *9*, 385-410.
18. Dhingra, B., Yadav, M., Saini, M., & Mittal, R. (2024). A bibliometric visualization of behavioral biases in investment decision-making. *Qualitative Research in Financial Markets*, *16*(3), 503-526.
19. 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*, 285-296.
20. Economou, F., Kostakis, A., & Philippas, N. (2011). Cross-country effects in herding behaviour: Evidence from four south European markets. *Journal of International Financial Markets, Institutions and Money*, *21*(3), 443-460.
21. Fama, E. F. (1970). Efficient capital markets. *Journal of finance*, *25*(2), 383-417.
22. Fang, H., Shen, C. H., & Lee, Y. H. (2017). The dynamic and asymmetric herding behavior of US equity fund managers in the stock market. *International Review of Economics & Finance*, *49*, 353-369.
23. Forlani, D., & Mullins, J. W. (2000). Perceived risks and choices in entrepreneurs' new venture decisions. *Journal of business Venturing*, *15*(4), 305-322.
24. Fraser, S., Bhaumik, S. K., & Wright, M. (2015). What do we know about entrepreneurial finance and its relationship with growth?. *International small business journal*, *33*(1), 70-88.
25. Gerth, F., Lopez, K., Reddy, K., Ramiah, V., Wallace, D., Muschert, G., Frino, A., & Jooste, L. (2021). The behavioral aspects of financial literacy. *Journal of Risk and Financial Management*, *14*(9), 395.
26. Glaser, M., & Weber, M. (2007). Overconfidence and trading volume. *The Geneva Risk and Insurance Review*, *32*, 1-36.
27. Guenther, C., Johan, S., & Schweizer, D. (2018). Is the crowd sensitive to distance?—How investment decisions differ by investor type. *Small Business Economics*, *50*, 289-305.
28. Hirshleifer, D. (2015). Behavioral finance. *Annual Review of Financial Economics*, *7*(1), 133-159.
29. Hjørland, B. (2013). Citation analysis: A social and dynamic approach to knowledge organization. *Information processing & management*, *49*(6), 1313-1325.
30. Jain, A., Agrawal, S., Goswami, S., Banga, S., Kumar, S., & Singh, N. (2020). Behavioural Finance Effect on Stock Price Trends During Covid-19 Pandemic. *Management Dynamics*, *20*(2),6.
31. Joghee, S., Alzoubi, H. M., & Dubey, A. R. (2020). Decisions effectiveness of FDI investment biases at real estate industry: Empirical evidence from Dubai smart city projects. *International Journal of Scientific & Technology Research*, *9*(3), 3499-3503.

32. Joshipura, M., & Wats, S. (2023). Decoding momentum returns: an integrated bibliometric and content analysis approach. *Qualitative Research in Financial Markets*, *15*(2), 254-277.
33. Kahneman, D. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica*, *47*, 278.
34. Kahneman, D., & Tversky, A. (2013). Prospect theory: An analysis of decision under risk. In *Handbook of the fundamentals of financial decision making: Part I* (pp. 99-127).
35. Kalra Sahi, S., & Pratap Arora, A. (2012). Individual investor biases: A segmentation analysis. *Qualitative Research in Financial Markets*, *4*(1), 6-25.
36. Kapoor, S., & Prosad, J. M. (2017). Behavioural finance: A review. *Procedia computer science*, *122*, 50-54.
37. Kengatharan, L., & Kengatharan, N. (2014). The influence of behavioral factors in making investment decisions and performance: Study on investors of Colombo Stock Exchange, Sri Lanka. *Asian Journal of Finance & Accounting*, *6*(1), 1.
38. Kim, K. A., & Nofsinger, J. R. (2008). Behavioral finance in Asia. *Pacific-Basin Finance Journal*, *16*(1-2), 1-7.
39. Kishor, N. (2022). Development and validation of behavioral biases scale: a SEM approach. *Review of Behavioral Finance*, *14*(2), 237-259.
40. Kumar, S., & Goyal, N. (2015). Behavioural biases in investment decision making–a systematic literature review. *Qualitative Research in financial markets*, *7*(1), 88-108.
41. Lao, P., & Singh, H. (2011). Herding behaviour in the Chinese and Indian stock markets. *Journal of Asian economics*, *22*(6), 495-506.
42. Merkle, C., & Weber, M. (2014). Do investors put their money where their mouth is? Stock market expectations and investing behavior. *Journal of Banking & Finance*, *46*, 372-386.
43. Muhammad, N. M. N., & Maheran, N. (2009). Behavioural finance vs traditional finance. *Adv. Manage*, *2*(6), 1-10.
44. Murnieks, C. Y., Haynie, J. M., Wiltbank, R. E., & Harting, T. (2011). 'I like how you think': Similarity as an interaction bias in the investor–entrepreneur dyad. *Journal of Management Studies*, *48*(7), 1533-1561.
45. Mushinada, V. N. C. (2020). Are individual investors irrational or adaptive to market dynamics?. *Journal of Behavioral and Experimental Finance*, *25*, 100243.
46. Mushinada, V. N. C., & Veluri, V. S. S. (2019). Elucidating investors rationality and behavioural biases in Indian stock market. *Review of Behavioral Finance*, *11*(2), 201-219.
47. Niehaus, G., & Shrider, D. (2014). Framing and the disposition effect: evidence from mutual fund investor redemption behaviour. *Quantitative Finance*, *14*(4), 683-697.
48. Odean, T. (1998). Are investors reluctant to realize their losses?. *The Journal of finance*, *53*(5), 1775-1798.
49. Pandey, R., & Jessica, V. M. (2018). Measuring behavioural biases affecting real estate investment decisions in India: Using IRT. *International Journal of Housing Markets and Analysis*, *11*(4), 648–668.
50. Parveen, S., & Siddiqui, M. A. (2018). Anchoring heuristic, disposition effect, and overconfidence bias in investors: A case of Pakistan Stock Exchange. *Abasyn Journal of Social Sciences*, *11*(2), 280–294.
51. Pikulina, E., Renneboog, L., & Tobler, P. N. (2017). Overconfidence and investment: An experimental approach. *Journal of Corporate Finance*, *43*, 175–192.
52. Pompian, M. M. (2012). *Behavioral finance and investor types: Managing behavior to make better investment decisions*. New York, NY: John Wiley & Sons.
53. Puaschunder, J. M. (2017). Socio-psychological motives of socially responsible investors. In *Global Corporate Governance* (Advances in Financial Economics, Vol. 19, pp. 209–247). Emerald Publishing Limited. https://doi.org/10.1108/S1569-373220160000019008
54. Qambar, F., & Asad, H. (2021). Herd behavior and information adoption by insurance buyers: Evidence from an emerging economy. *International Journal of Management Research and Emerging Sciences*, *11*(4), 73–89.
55. Rauf, A., Khurshid, M. K., & Afzal, M. (2018). Impact of overconfidence and loss aversion biases on equity investor's decision-making process and performance. *NICE Research Journal*, *11*(2), 156–180.
56. Sahi, S. K. (2017). Psychological biases of individual investors and financial satisfaction. *Journal of Consumer Behaviour*, *16*(6), 511–535.
57. Sassmannshausen, S. P., & Volkmann, C. (2013). *A bibliometric based review on social entrepreneurship and its establishment as a field of research* (No. 2013-003). SCHUMPETER discussion papers.
58. Schindler, M. (2007). *Rumors in financial markets: Insights into behavioral finance*. John Wiley & Sons.
59. Seo, M. G., & Barrett, L. F. (2007). Being emotional during decision making—Good or bad? An empirical investigation. *Academy of Management Journal*, *50*(4), 923–940.
60. Shah, S. Z. A., Ahmad, M., & Mahmood, F. (2018). Heuristic biases in investment decision-making and perceived market efficiency: A survey at the Pakistan stock exchange. *Qualitative Research in Financial Markets*, *10*(1), 85–110.
61. Shefrin, H. (2000). *Beyond greed and fear: Understanding behavioral finance and the psychology of investing.* Oxford: Oxford University Press.
62. Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of finance*, *40*(3), 777-790.
63. Shiller, R. J. (1999). Human behavior and the efficiency of the financial system. *Handbook of Macroeconomics*, *1*, 1305–1340.

64. Shleifer, A. (2000). *Inefficient markets: An introduction to behavioural finance.* OUP Oxford.
65. Shrotryia, V. K., & Kalra, H. (2021). Analysis of sectoral herding through quantile regression: A study of S&P BSE 500 stocks. *International Journal of Business & Economics*, *20*(1).
66. Shrotryia, V. K., & Kalra, H. (2022). Herding in the crypto market: A diagnosis of heavy distribution tails. *Review of Behavioral Finance*, *14*(5), 566–587.
67. Statman, M. (1999). Behavioral finance: Past battles and future engagements. *Financial Analysts Journal*, *55*(6), 18–27.
68. Sunak, Y., & Madlener, R. (2016). The impact of wind farm visibility on property values: A spatial difference-in-differences analysis. *Energy Economics*, *55*, 79–91.
69. Tesar, L. L., & Werner, I. M. (1995). Home bias and high turnover. *Journal of International Money and Finance*, *14*(4), 467–492.
70. Thaler, R. H. (2014). Behavioral economics: Past, present, and future. *American Economic Review*, *106*(7), 1577–1600.
71. Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124–1131.
72. Waweru, N. M., Munyoki, E., & Uliana, E. (2008). The effects of behavioural factors in investment decision-making: A survey of institutional investors operating at the Nairobi Stock Exchange. *International Journal of Business and Emerging Markets*, *1*(1), 24–41.
73. Wolman, B. B. (1973). *Concerning psychology and the philosophy of science*. New York, NY: Harper & Row.
74. Zacharakis, A. L., & Meyer, G. D. (1998). A lack of insight: Do venture capitalists really understand their own decision process? *Journal of Business Venturing*, *13*(1), 57–76.
75. Zacharakis, A. L., & Shepherd, D. A. (2016). The nature of information and overconfidence in venture capitalists' decision-making. In *Decision Making in Entrepreneurship* (pp. 427–448).
76. Zahera, S. A., & Bansal, R. (2018). Do investors exhibit behavioral biases in investment decision making? A asystematic review. *Qualitative Research in Financial Markets*, *10*(2), 210–251. s