ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue II, February 2026

Behavioural Biases in Investment Decision-Making: A Review, Synthesis and Future Research Agenda

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DOI: https://doi.org/10.51583/IJLTEMAS.2026.15020000149

Received:14 March 2026; Accepted: 19 March 2026; Published: 27 March 2026

ABSTRACT

The study of behavioural finance has garnered significant interest from many researchers, showing a growing trend in the publication of research articles in recent times. This paper presents a systematic review and bibliometric analysis of the existing literature in the field of behavioural finance. The study utilized RStudio and VOS viewer software to perform a bibliometric analysis of data retrieved from the Scopus database following the PRISMA protocol. It also systematically reviewed existing literature to identify key behavioural biases, methodologies, and findings of the selected articles. The findings reveal a growing trend in the publication of research articles, the most impactful authors and journals, the most frequently used keywords, and the top contributing countries and organizations. The paper concludes by suggesting a future research agenda based on the research gaps identified after reviewing the selected studies.

Keywords: Behavioural Biases, Behavioural Finance, Systematic Review, Bibliometric Analysis, Content Analysis.

INTRODUCTION

The origins of behavioural finance can be traced back to the groundbreaking work of psychologists Daniel Kahneman and Amos Tversky, who introduced the concepts of prospect theory and heuristics in decision-making (Kahneman and Tversky, 1979). Their research revealed that people often rely on cognitive shortcuts and exhibit predictable biases, such as overconfidence, loss aversion, and herd behaviour (Tversky and Kahneman, 1981). These biases can lead to suboptimal investment decisions and market anomalies, including bubbles and crashes (Shiller, 2000). Behavioural finance has developed as a framework that replaced the assumptions of standard finance theory by incorporating psychological factors into the analysis of financial markets (Sayed & Sayed, 2014). Behavioural finance has merged concepts from finance, economics, and psychology to better understand human behaviour while investing in various investment avenues and has developed more effective investment strategies (Sayed & Sayed, 2014). Unlike several conventional finance theories, such as Expected Utility Theory, Modern Portfolio Theory, Capital Assets Pricing Model, Efficient Market Hypothesis, and Arbitrage Pricing Theory, assert that all investors are rational, markets are efficient, and expected returns are determined by risk (Byrne, 2008) behavioural fiancé theories like Prospect Theory by Kahneman and Tversky (1979), Heuristic Theory by Kahneman and Tversky (1974), Framing Theory etc are of the opinion that investors are not rational every time and are prone to certain biases which are known as behavioural biases or alimonies. These biases are also considered behavioural factors. Behavioural biases are those elements that impede investors in making logical or rational decisions and drag them into irrationality. The term behavioural bias is derived from the concept of Behavioural Finance. It addresses how emotional and cognitive aspects hinder investment decisions of an Individual. The success of the investment is largely driven by the influences of these biases as such it is essential for investors to recognize their presence and actively strive to limit their effects to make better-informed and effective investment decisions.

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Research on behavioural biases has experienced significant growth over the past two decades, driven by increasing interest and a surge in publications from academic scholars (Jain, 2021). This surge in scholarly interest highlights the importance of systematically reviewing and synthesizing existing knowledge to delineate the current status of the discipline and identify potential research trajectories. This paper aims to give an overview of the current state of research conducted in the field of behavioural finance. By conducting a systematic and bibliometric analysis of studies published in this domain, we seek to highlight key behavioural biases, methodologies, and findings, as well as identify influential authors, journals, keywords, and contributing countries and organizations. Further by synthesizing findings from previous studies this study will highlight gaps in the current literature and propose a future research agenda that addresses these gaps.

RESEARCH METHODOLOGY

The purpose of the present study is to review the research papers published in the discipline of behavioural biases. As such, the Systematic literature review (SLR) method is being adopted in the present study. SLR provides a concise and thorough assessment of the existing evidence and help identify research gaps. They can also highlight methodological issues to improve future work in a particular topic area (Pericic and Tanveer, 2019). The study also followed the PRISMA protocol to identify the most relevant papers from the database. The PRISMA model aids in creating a flow diagram that clearly and consistently outlines the process of selecting and including pertinent studies in a systematic review (Motahari-Nezhad et al., 2021). Further, a bibliometric analysis is being conducted to determine the publication trend, top contributing countries, impactful Journals and authors, most cited research papers, and most frequently used keywords. Bibliometric reviews utilize statistical tools to analyse a large volume of published research, identifying trends, citations, and co-citations related to a specific theme by year, country, author, journal, methodology, theory, and research problem (Rialp et al., 2019). A content analysis is also being performed to identify the behavioural biases, population, and statistical tools adopted by different authors in their studies. Moreover, the findings of the selected papers are also being discussed in the present study. The process adopted for selecting the relevant papers is shown in

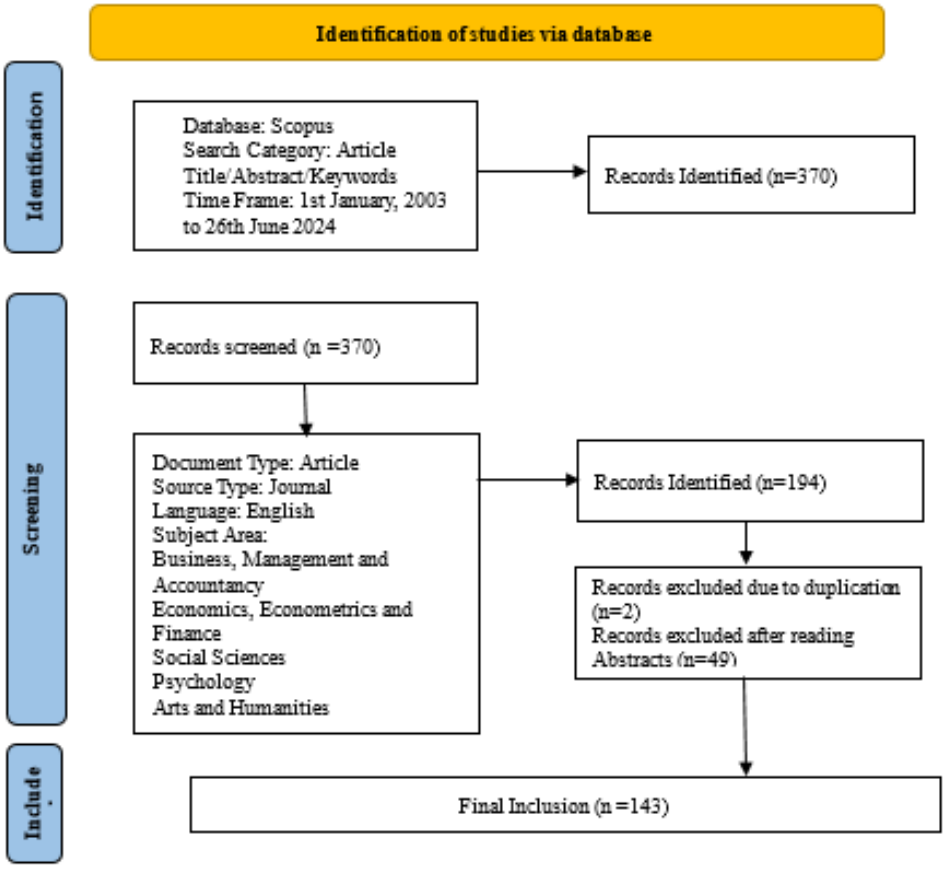

Figure 1: PRISMA flow diagram (Authors' Compilation)

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Database and Keywords

Due to comprehensive coverage of peer-reviewed literature, access to high quality research articles, and advance search tools allowing for precise retrieval of relevant articles by title, abstract, and keywords, the Scopus database was being used in the present study. The data were extracted from the database by selecting "article title, abstract, keywords" from the search options and entering "Behavioural biases in investment decision making" into the search document field of the Scopus interface. Further, the search strategy included only those papers with the keywords behavioural finance, investment decision, investments, behavioural biases, overconfidence bias, cognitive bias, psychological bias, disposition effect, loss aversion, cognitive biases, regret aversion, anchoring, herding, overconfidence bias, heuristic, prospect theory, illusion of control, home bias, mental accounting, framing, conservatism, and availability bias

Selection of Articles

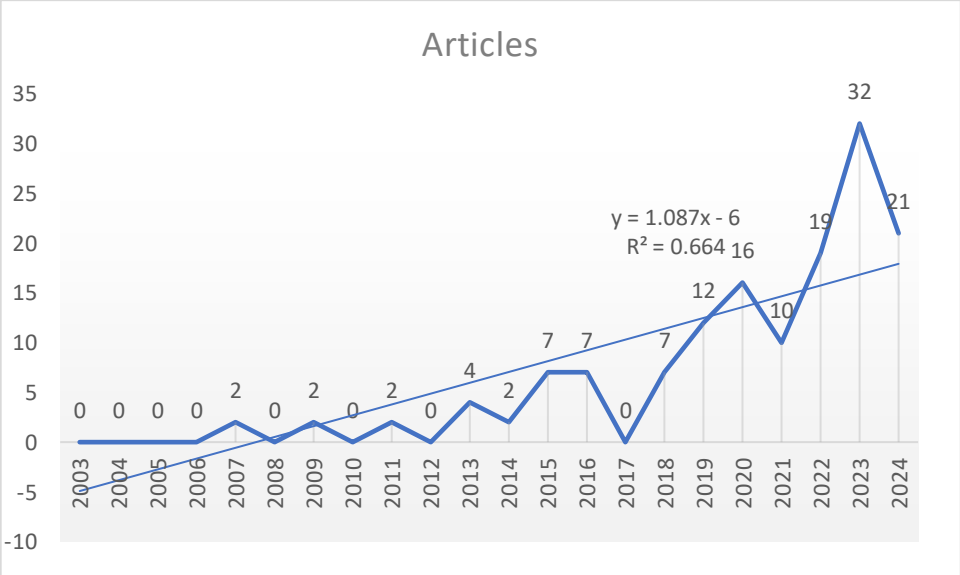
The initial search result showed 370 records. Subsequently, several filters as shown in PRISMA flow diagram 1 were applied and 194 articles were deemed eligible for further evaluation. Among these, 2 articles were identified as duplicates. Further screening based on titles and abstracts revealed that 49 articles were irrelevant and unrelated to the study area. Finally, 143 articles were selected for the present study.

RESULTS AND DISCUSSIONS

The results are delineated in two sections. The result of the bibliometric analysis is presented in the first section which includes publication trends, contributing countries, contributing organisations, impactful journals, most influential studies, impactful authors, and frequently used keywords. In the second section, the result of content analysis of the selected studies is presented. This includes themes, research methodologies, and key findings of the selected studies. Together, these sections provide an overview of the current state of research in the field of behavioural finance.

Bibliometric Analysis

Publication Trend



Source: Authors' Computation

Figure 1 shows the published trend of articles each year from 2003 to 2024. Although there was possibility of articles published and indexed in Scopus during 2003 to 2006, they were not captured in the records due to filters applied by authors in the Scopus interface, as depicted in PRISMA flow diagram 1. The number of publications

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started to increase gradually from 2007, with notable jumps in 2013, 2019, 2020, and 2022. The highest articles were published in 2023 (32 articles). The trendline, represented by the equation ($y = 1.087x - 6$), indicates a moderate positive linear relationship between the years and the number of articles. The coefficient of determination, ($R^2 = 0.66416$), implies that 66% of the variation in the number of articles can be explained by the year. This upward trend highlights a growing interest of the researcher over time, with projections showing a significant increase by 2024.

Countries and Affiliations

Top contributing countries

Table 1: Top 10 Contributing Countries

Region	Frequency	Rank
India	166	1
Pakistan	31	2
USA	25	3
UK	23	4
Brazil	17	5
Indonesia & Malaysia	12	6
Germany	10	7
Australia, China & South Africa	7	8
Poland & Turkey	6	9
Bangladesh, France, Ghana & Iraq	5	10

Table 1 provides a ranking of the top 10 contributing countries based on the number of research papers published. India leads the list with 166 contributions, making it the highest contributor. Following India, Pakistan ranks second with 31 contributions, and the USA is third with 25 contributions. The UK comes in fourth with 23 contributions, while Brazil is fifth with 17 contributions. Both Indonesia and Malaysia share the sixth position with 12 contributions each. Germany is ranked seventh with 10 contributions. Australia, China, and South Africa are tied for the eighth position, each contributing 7 articles. Poland and Turkey are ninth with 6 contributions each. Finally, Bangladesh, France, Ghana, and Iraq each have 5 contributions, placing them in the tenth position. India's substantial lead suggests a strong presence and focuse on behavioural finance research, potentially indicating significant academic and practical interest in the field within the country. The list reflects global participation in behavioural finance research, with contributions from countries across different continents. The clustering of contributions from Southeast Asia (India, Pakistan, Indonesia, Malaysia) and Europe (UK, Germany, Poland, Turkey) suggests regional concentrations of interest and expertise. The presence of countries like Brazil and South Africa in the top ranks indicates growing interest and activity in behavioural finance beyond traditional academic powerhouses. The distribution of contributions highlights both established and emerging centres of research activity in the field of behavioural finance globally.

Top Contributing Organisations

Table 2: Top Contributing Organisations

Organisations	Number of Article
Sri Aurobindo College of Commerce and Management	14
Amity University	7

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Malaviya National Institute of Technology	7
University School of Applied Management	7
Aligarh Muslim University	6
National Institute of Technology	6
Doon University	4
Iran University of Science and Technology	4
Islamia College Peshawar	4
Jaypee Business School	4
Symbiosis International (Deemed University)	4
University Of Alabama	4
University Of Hyderabad	4

Table 2 presents the top contributing organizations based on the number of articles published. Sri Aurobindo College of Commerce and Management in India leads with 14 articles. Following this, Amity University, Malaviya National Institute of Technology, and University School of Applied Management, all from India, have each published 7 articles. Aligarh Muslim University and the National Institute of Technology in India have each contributed 6 articles. Several institutions, including Doon University in India, Iran University of Science and Technology, Islamia College Peshawar in Pakistan, Jaypee Business School in India, Symbiosis International (Deemed University) in India, University of Alabama in the United States, and University of Hyderabad in India, have each published 4 articles. This data highlights the significant contributions of Indian institutions to the research landscape, with a notable presence from universities in Iran, Pakistan, and the United States as well.

Citation Analysis

Most Impactful Journals

Table 3: Top 10 Impactful Journals

Journal	H Index	Total Citation	No. of Publications
Review of Behavioral Finance	6	224	8
Qualitative Research in Financial Markets	5	281	8
Indian Journal of Finance	4	39	4
Frontiers in Psychology	3	28	3
International Journal of Emerging Markets	3	16	3
International Journal of Housing Markets and Analysis	3	38	3
Risks	3	18	3
International Journal of Financial Research	2	39	2
International Journal of Management	2	17	2
Journal of Behavioural and Experimental Finance	2	16	2

Table 3 lists the top 10 impactful journals in the field of finance and psychology, ranked by their H-index, total citations, and number of publications. The Review of Behavioural Finance tops the list with an H-index of 6, 224 total citations, and 8 publications.

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Qualitative Research in Financial Markets follows closely with an H-index of 5, 281 citations, and 8 publications. Other notable journals include the Indian Journal of Finance and Frontiers in Psychology, each with an H-index of 4 and 3 respectively. The table highlights the prominence of these journals in contributing to research, with varying levels of impact and publication frequency.

Top articles by local Citations

Table 4: Top 10 Papers by Local Citation

Paper Title	Author	Local Citations	Global Citations	Average Citation
Trading performance, disposition effect, overconfidence, representativeness bias, and experience of emerging market investors	Chen et al., 2007	30	326	18.11
Behavioural biases in investment decision making – a systematic literature review	Kumar and Goyal, 2015	26	156	15.6
Evidence on rationality and behavioural biases in investment decision making	Kumar and Goyal, 2016	23	89	9.89
How financial literacy and demographic variables relate to behavioural biases	Baker et al., 2019	18	117	19.5
An Exploratory Inquiry into the Psychological Biases in Financial Investment Behaviour	Sahi et al., 2013	13	74	6.17
Behavioural Biases on Investment Decision: A Case Study in Indonesia	Kartini and Katiya, 2021	11	33	8.25
Factors influencing investor's decision making in Pakistan: Moderating the role of locus of control	Rasheed et al., 2018	11	56	8
An Analysis of Behavioural Biases in Investment Decision-Making	Madaan and Singh, 2019	9	33	5.5
Evaluation of Behavioural biases affecting investment decision making of individual equity investors by fuzzy analytic hierarchy process	Jain et al., 2020	9	81	16.2
Heuristic-driven bias in property investment decision-making in South Africa	Lowies et al., 2016	7	28	3.11

Table 4 presents the top 10 research papers on behavioural biases in investment decision-making, ranked by local citations. The most cited paper is by Chen et al. (2007), with 30 local citations and 326 global citations, focusing on trading performance and various biases among emerging market investors.

Kumar and Goyal have two papers from 2015 and 2016, with 26 and 23 local citations respectively, both addressing systematic literature reviews and evidence on rationality and biases. Other notable papers include Baker et al. (2019) on financial literacy and demographic variables, and Sahi et al. (2013) exploring psychological biases.

The list also features studies from Indonesia, Pakistan, and South Africa, highlighting the global interest in this topic. The average citation per paper varies, with Baker et al. (2019) having the highest at 19.5.

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OST Impactful Authors

Table 5: Top 10 Impactful Authors

Author	No. of Articles Published	H Index	Total Citation
Goyal N	5	5	396
Kumar S	5	5	396
Gupta S	4	4	119
Jain J	7	4	154
Singh S	7	4	100
Walia N	5	4	149
Baker H k	3	3	146
Sharma M	3	3	20
Sood K	4	3	12
Adil M	2	2	46

Table 5 shows the top 10 impactful authors based on total number of articles published, their H-index, and total citations. Goyal N and Kumar S lead with 5 articles each, an H-index of 5, and 396 total citations. Jain J and Singh S have published the most articles, with 7 each, but have lower H-indexes and total citations compared to Goyal and Kumar. Gupta S and Walia N have 4 and 5 articles respectively, with H-indexes of 4. Baker HK, Sharma M, and Sood K have fewer articles and lower H-indexes, with Baker having the highest total citations among them. Adil M has the fewest articles and citations, with an H-index of 2. This table highlights the varying impact of authors based on their publication count, H-index, and citation metrics.

Frequently used Keywords

Table 6: Most frequently used keywords

Keywords	Occurrences	Keywords	Occurrences
Behavioural finance	147	Prospect Theory	16
investment decision	124	Risk Perception	16
Behavioural biases	109	Financial Market	14
Cognitive Bias	53	Anchoring	12
Overconfidence	45	Regret Aversion	7
Herding	23	Mental Accounting	7
Heuristics	23	Confirmation Bias	6
Disposition Effect	21	Framing	6
Loss Aversion	19	Home Bias	6
Psychological Biases	18	Familiarity	5

Table 6 presents the most frequently used keywords in the field of behavioural finance and investment decision-making. Behavioural finance is the most common, followed by investment decisions. Other significant terms include behavioural biases, cognitive bias, and overconfidence. Less frequent but notable terms include herding, heuristics, and disposition effect. Other relevant terms include loss aversion, psychological biases, prospect

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theory, risk perception, financial market, and anchoring. Less frequent terms include regret aversion, mental accounting, confirmation bias, framing, home bias, and familiarity.

Content Analysis and Synthesis

Behavioural Biases identified from the literature

A content analysis, which systematically, objectively, and quantitatively analyses the content of existing literature, was conducted, and while doing so, several key behavioural biases were identified, indicating the existence of various behavioural biases. Following the foundational work of Kahneman and Tversky (1974, 1979, 1981), these biases are categorized into two main types: Heuristic-Driven Biases and Frame-Dependent Biases. Table 6 provides a detailed list of the identified behavioural biases under these two categories.

Table 6: Behavioural Biases identified from the literature

Heuristic Driven Biases	**Authors**
Overconfidence	Madaan,2019; Sabir, 2019; Pradhan, 2021; Singh 2022; Gani, 2023; Iram, 2023; Srinivasan, 2023; Khilar, 2019; Adil, 2021; Jain, 2023; Hossain, 2022; Abideen, 2023; Parmitasari, 2022; Gupta 2019; Ullah, 2020; Benayad, 2023; Yasmin, 2023;
Availability	Iram, 2023; Srinivasan, 2023; Piotrowski, 2022; Jain, 2023; Sudirman, 2023; Gupta 2019;
Representativeness	Singh 2022; Srinivasan, 2023; Jain, 2023; Sudirman, 2023; Gupta 2019; Yasmin, 2023;
Anchoring	Madaan,2019; Gurung, 2024; Pradhan, 2021; Arora 2023; Zhang, 2022; Srinivasan, 2023; Piotrowski, 2022; Jain, 2023; Gupta 2019;
Conservatism	Pradhan, 2021; Sudirman, 2023;
Herding	Sabir, 2019; Pradhan, 2021; Singh 2022; Srinivasan, 2023; Adil, 2021; Hossain, 2022; Sharma, 2020; Abideen, 2023; Ullah, 2020; Yasmin, 2023; Yasmin, 2023;
Gamblers Fallacy	Srinivasan, 2023; Jain, 2023;
Optimism	Zhang, 2022; Sharma, 2020; Benayad, 2023;
Hindsight Bias	Tavor, 2013; Hasan, 2023; Yasmin, 2023;
Self-Attribution Bias	Yasmin, 2023;
Status quo	Pradhan, 2021;
Confirmation	Trehan, 2021; Aziz, 2024: Pradhan, 2021; Hasan, 2023;
Frame Dependent Biases	**Authors**
Cognitive Dissonance	Misra, 2022; Yasmin, 2023;
Loss Aversion	Mangala, 2014; Pradhan, 2021; Srinivasan, 2023; Hossai, 2022; Yasmin, 2023;
Regret Aversion	Srinivasan, 2023; Adil, 2021; Wangzhou, 2021;
Mental Accounting	Pradhan, 2021; Srinivasan, 2023; Sharma, 2020;
Illusion of Control	Parmitasari, 2022; Yasmin, 2023;
Disposition Effect	Madaan, 2019; Singh 2022; Arora 2023; Khilar, 2019; Sharma, 2020; Abideen, 2023; Ullah, 2020;

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Statistical Methods used by authors

Table 7: Statistical Method used by authors in the top 20 papers

Authors	Population	Statistical Tools/Techniques
Chen et al., 2007	Chinese Individual and Institutional Investors	Regression
Kumar and Goyal, 2015	Articles published in peer-reviewed journals	Systematic Literature Review
Kumar and Goyal, 2016	Indian Individual Investors	T-test, ANOVA, Fisher's LSD, and SEM
Baker et al., 2018	Indian Individual Investors	ANOVA, Factor Analysis, Multiple Regression Analysis
Sahi et al., 2013	Resident of NCR, Delhi	Open Analysis
Kartini and Nahda, 2021	Individual Investors in Yogyakarta	T-Test
Rasheed et al., 2018	Individual Investors residing in Islamabad, Lahore, and Sargodha	Correlations, Regression, and SEM
Madaan & Singh, 2019	Investors in NSE	Correlations, Regression
Jain et al., 2019	Individual equity investors of Punjab	MCDM and Fuzzy AHP
Lowies and Hall, 2015	fund managers of all South African-based property funds listed on the Johannesburg Securities Exchange	Fisher's Exact test
Adil et al., 2021	individual investors of the Delhi-NCR region	Hierarchical regression
Parveen et al., 2020	Retail Investors trading in the Pakistan Stock Exchange	F-Square, Chi-square, Mediation Analysis
Pandey and Jessica, 2018	Retail Real Estate investors	IRT & SEM
Mushinada and Veluri, 2019	Individual Investors	Factor Analysis, SEM
Jain et al., 2021	Research Paper retrieved from the Scopus database	Bibliometric Analysis
Kiymaz, 2016	Employees brokerage company in Turkey	Ordered logit regression
Rzeszutek, 2015	Retail investors and students who invest in the Warsaw Stock Exchange	Chi-Square, Logistic Regression
Pandey and Jessica, 2018	Indian Real Estate Investor	SEM
Costa et al., 2018	Articles retrieved from the Web of Science Database	Bibliometric Analysis
Niehaus and Shrider, 2013	Individual Investors who invest in a mutual fund	Probit Regression Analysis

Table 7 presents a summary of statistical methods used by authors in the top 20 research papers. It includes a diverse range of populations, such as individual and institutional investors from various regions like China, India, Pakistan, Turkey, and South Africa. The statistical tools and techniques employed are varied, including regression analysis, systematic literature review, T-tests, ANOVA, factor analysis, SEM (Structural Equation Modeling), hierarchical regression, bibliometric analysis, and more. This diversity in methodologies reflects the

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comprehensive approach researchers have taken to study the impact of behavioural biases on investment decision-making processes across different demographics and geographical locations.

Empirical findings of the selected studies

Heuristic-driven biases in investment decision-making

Heuristic theory posits that heuristics are cognitive shortcuts or rules of thumb employed by investors to facilitate rapid and efficient decision-making. They elucidate intricate issues by minimising the cognitive burden necessary for decision-making. It helps investors in making quick decisions by simplifying the process of assessing probability and predicting values into simpler judgments. Investors also use heuristics to mitigate the risk of losses during times of uncertainty. While heuristics can be very useful, they can also lead to systematic errors or biases (Kahneman and Tversky, 1974).

Some of the key heuristics identified by the researcher include overconfidence, availability, representativeness, anchoring, conservatism, herding, gamblers' fallacy, optimism, hindsight bias, self-attribution bias, and confirmation. All the heuristic biases except the overconfidence bias significantly contribute to irrational decision-making (Khare and Kapoor, 2023). Herding, representativeness, availability, and anchoring biases all influence the decision-making of housing market investors. Women exhibit higher availability and anchoring heuristics, while investors with above-average income demonstrate greater overconfidence and are more susceptible to fluctuations in house prices and location (Cascao et al., 2022). Individual IPO investors are also prone to availability bias and representativeness bias (Singh et al, 2022). Overconfidence, anchoring, and representativeness bias contribute to the irrational investment decision-making of secondary equity investors (Isidore and Christie, 2018). Overconfidence and availability heuristics significantly impact the investment decisions of women entrepreneurs, too, but financial literacy serves as a key mediator between these heuristics and investment decision-making (Iram et al., 2023).

Availability bias and representativeness are another two key biases that significantly and positively influence investors' investment decisions. However, it is not the same in the case of availability bias, as no such moderating effect was observed (Khan, 2021). Though retail investors tend to make investment decisions based on their existing knowledge and past experiences, they end up making irrational investment decisions because they usually rely on past performance to predict the future (Agarwal and Singh, 2024). Indian investors, while making investment decisions, often rely on the first piece of information they receive or the only information available, falling prey to anchoring bias and tend to sell stocks when they see a price increase and either hold onto or buy more shares when prices decline (Agarwal and Singh, 2024). Females are more susceptible than their male counterparts (Ether and Owusu, 2023). Trehan and Sinha (2021) suggest that investors who invest through different applications usually join virtual communities and tend to seek information that supports their preexisting views, while disregarding or undervaluing information that contradicts them. As such, they become prey to confirmation bias and end up making an irrational investment decision. Additionally, the fear of missing out (FOMO) bias plays a complementary role in mediating the relationship between herding and crypto investors' decision-making behaviour (Kaur et al., 2023).

Studies also suggested that financial literacy does not have any positive moderating impact on the influence of overconfidence bias and anchoring bias (Kathpal, 2023). An increased level of financial literacy did not mitigate the likelihood of anchoring; rather, it exacerbated it. (Esther and Owusu, 2023). An attempt has also been made to see if gamification can help reduce the influence of behavioural biases by analysing trading data from investors with both real and simulated portfolios. Active participation in the stock market game reduces the impact of overconfidence and disposition effect biases but increases the impact of familiarity and status quo biases (Şenol and Onay, 2023). A study on the impact of behavioural biases on real estate investors revealed the four most prominent and significant biases, namely anchoring, representativeness, availability, and regret aversion (Pandey and Jessica, 2018), although biases need not always be regarded as negative. Biases can sometimes benefit investors by minimizing expensive errors and aiding in the attainment of investment satisfaction. The presence of investment satisfaction serves as a mediator between behavioural biases and reinvestment intention, suggesting that biases are inherent tendencies in response to limited learning. (Pandey and Jessica, 2018).

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Frame dependent biases and investment decision making

Frame dependent biases are cognitive biases where people's decisions are influenced by how information is presented, rather than the information itself. It refers to the cognitive distortions that occur due to the way information is presented or "framed," which influences people's decisions and judgments. According to Tversky and Kahneman (1981), this phenomenon is a type of cognitive bias where the presentation of choices affects how people perceive and evaluate options, even if the underlying information remains the same. The inclination to overestimate and the fear of making mistakes are the main factors influencing the financial decisions of individual investors (Bihari et al., 2023). Regret aversion, loss aversion, the gambler's fallacy, and mental accounting are interrelated and significantly contribute to irrational investment decision-making of secondary equity investors (Isidore and Christie, 2018). Among the many emotional factors affecting investors' choices, risk aversion and risk perception are particularly significant, often leading to irrational decision-making. Financial theories suggest several ways to mitigate these biases. Unfortunately, investors rarely follow the rules laid out by these theories (Hossain, Siddiqua, 2022). Mutual fund investors exhibit a strong aversion to selling poorly performing funds when they withdraw the proceeds from their accounts (Sale frame), a behaviour consistent with the disposition effect but when the transaction is framed as a transfer within the same account (transfer frame), this aversion is significantly reduced indicating that framing a transaction as a transfer rather than a sale can mitigate the disposition effect (Niehaus and Shrider, 2013). Chinese individual investors exhibit the disposition effect; they tend to sell winners' stock too early and hold losers' stock too long (Chen et al., 2007). The fear of missing out (FOMO) bias partially mediates the connection between loss aversion and decision-making behaviour among cryptocurrency investors (Kaur et al., 2023). Fear, behavioural biases, and euphoria are the main cognitive factors that influence the decision-making capacity of financial market professionals (Cardoso, 2022). Apart from anchoring bias, availability bias, and herding bias, there are several other biases, such as status quo, switching cost, sunk cost, regret avoidance, and perceived threat, that significantly affect the investment intention of retail investors (Mamidala, 2023). The fuzzy analytic hierarchy process method of evaluating the effect of behavioural biases in investment decision making identified loss aversion as one among the top three most influential biases, including herding and overconfidence, that affect the investment decision-making capacity of individual investors (Madaan and Singh, 2019).

Mediating role of personality trait, financial literacy and other factors in the influence of Frame dependent biases and Frame dependent biases on investment decision making.

The influence of behavioural biases also depends on the personality trait of a person. For instance, neuroticism, extraversion, and openness are significantly associated with most of the behavioural biases except for the anchoring bias. While openness is linked to many emotional biases and cognitive heuristics, extraversion has a positive relationship with availability bias (Baker, 2022). Key personality trait like locus of control, also significantly influence the investors; for instance, investors with a high internal locus of control exhibited lower levels of cognitive dissonance bias compared to those with a low internal locus of control (Lather et al., 2020). The attitude of the investors towards investment intention also mediates the effects of these biases (Mamidala, 2023). Personality traits, especially venturesomeness, affect susceptibility to behavioural biases. Venturesome individuals are more inclined to make rational decisions, whereas traits like impulsivity and empathy do not significantly influence susceptibility to these biases (Rzeszutek et al., 2015). There is a positive correlation between self-attribution and overconfidence, indicating that when self-attribution increases or decreases, overconfidence tends to increase or decrease correspondingly (Mushinada and Veluri, 2019).

An attempt was made in several studies to determine if financial literacy moderates the impact of behavioural biases on investment decision-making. Financial literacy was found to significantly moderate the effects of four biases-overconfidence, risk-aversion, herding, and disposition on investment decisions (Adil et al., 2021). The study of Jain et al. (2023) also confirms that there lies a significant relationship between financial literacy and investment decision-making, and this relationship is mediated by the herding and overconfidence biases. Further study on the impact of the level of financial literacy on behavioural biases revealed that financial literacy has a mixed impact on behavioural biases; it is negatively associated with the disposition effect and herding bias but is positively associated with mental accounting and shows no significant effect on overconfidence (Baker et al., 2018). Demographic factors such as age, gender, and investment experience also significantly influence these

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biases. Males tend to be more overconfident than females, and younger or less experienced investors are more prone to herding and representativeness biases. Overconfidence increases with investment experience, and higher education levels are linked to lower susceptibility to the disposition effect (Baker et al., 2018).

Many investors also use social media to seek information regarding financial matters. These platforms can hinder rational decision-making due to the prevalence of unauthentic and misleading information. As such, social media also significantly influences the investment decision-making of an individual and exacerbates the effects of herding and overconfidence bias, and influences risk perception (Sathya, 2023). A moderating effect of investor type is seen in the case of overconfidence bias and hindsight bias. Active investors tend to exhibit more overconfidence bias, whereas inactive investors are more prone to hindsight effects (Ullah et al., 2021). Bhatia et al. (2021) conducted a study to see if a robo-advice service helps in mitigating behavioural biases; however, the empirical findings of their study showed that even the use of robo-advice doesn't seem to help in mitigating the impact of these biases. Students are also prey to cognitive biases, and their investment choices in various avenues are influenced by these biases. Financial literacy positively impacts the degree to which these biases affect their decisions. (Ashfaq et al., 2023). Individual investors are not only the ones falling prey to various biases, but it also influences the investment decision-making capacity of even institutional and financial professionals, as their forecasting and decision-making are not always rational and often are affected by various biases (Khare and Kapoor, 2023).

CONCLUSION AND FUTURE RESEARCH AGENDA

This systematic and bibliometric analysis of behavioural biases in investment decision-making highlights several key findings that contribute to the understanding of behavioural finance. Firstly, the study identifies a significant increase in the number of publications, with 143 relevant articles selected from an initial pool of 370, indicating a growing interest in the field. The analysis reveals that the most frequently used keywords include "behavioural finance," "investment decision," and "behavioural biases," underscoring the central themes that dominate current research. Moreover, the study identifies critical behavioural biases such as overconfidence, loss aversion, herding, and the disposition effect, which significantly impact investor decision-making and lead to irrational behaviours in financial markets.

The findings also highlight the role of cognitive biases, including anchoring and mental accounting, in shaping investment choices. Additionally, the systematic and bibliometric analysis of behavioural biases in investment decision-making underscores the significant growth and evolution of research in the field of behavioural finance over the past two decades. The findings reveal a robust increase in publications, highlighting the contributions of various institutions, particularly from India, and the emergence of impactful journals that shape the discourse in this domain. By identifying key behavioural biases, methodologies, and influential authors, this study provides a comprehensive overview of the current state of research, while also mapping the trajectory of future inquiries.

Based on the findings of the article regarding behavioural biases in investment decision-making, a significant future research agenda can be proposed. While there is substantial literature on behavioural biases, there is a lack of comprehensive studies exploring how emerging technologies, such as artificial intelligence (AI), machine learning, and algorithmic trading, interact with these biases. Specifically, the impact of robo-advisors and trading platforms that utilize gamification techniques on investor behaviour and decision-making processes remains underexplored; as such, this study emphasizes the need for further research that includes investigating the impact of technology on behavioural biases, conducting cross-cultural studies, implementing longitudinal research, and developing interventions to mitigate the effects of these biases. Further, a study in neurofinance can be conducted to understand the psychological and neurological aspects of the investors.

ACKNOWLEDGEMENT

The author acknowledges the financial support received from the Indian Council of Social Science Research (ICSSR), New Delhi, under the ICSSR Doctoral Fellowship for carrying out this research.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue II, February 2026

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