Advances in Consumer Research
https://acr-journal.com/
Volume-2 | Issue-6 | Dec 2025
Original Researcher Article

Impact of Behavioural Biases on Decisions of Retail Investors: A Bibliometric Analysis

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ABSTRACT
Purpose - The purpose of the paper is to study the influence of behavioural biases on investors. The behavioural biases can change the way individuals take their investment decisions. This paper analyses all the research done on this relation over the last 10 years. The stockbrokers and fund managers can benefit from the results as they advise on personalized investment strategies to individuals. These drivers also impact broader market trends and lead to instabilities. So, this study is crucial for financial advisors, investors, and policymakers.
Design/methodology/approach -The author has conducted a literature review to identify existing relevant work from various authors, who have studied the relation between behavioural biases and investment decisions of retail investors. Most authors have used a survey for calculating behavioural biases and few have used other methods.
Findings - The findings show that there is a significant impact of behavioural biases on investment decisions and behaviour of investors. Most of the biases have a positive impact and few have a negative impact on retail investors.
Practical implications - The retail investors should take investment decisions after taking into account the influence of behavioural biases. The financial advisers can analyse this relation in terms of clients and then advise them accordingly.
Social implications - All types of investors can gain insight into the different types of behavioural biases of individuals and their investment decisions
Keywords: Behavioural biases, Overconfidence, Herding, Disposition effect, Mental accounting, Anchoring bias, Investors

1. INTRODUCTION:

Behavioural biases can be emotional biases as well as cognitive biases. These are forms of heuristic simplifications; caused by our brain's tendency to make mental shortcuts so as to avoid lengthy analytical procedures (Chen et al., 2007). The traditional finance theorists suggested that investors think and behave rationally, unaffected by emotional biases. Investors consider all available information before making any trading or investment decisions. The purpose of behavioural finance is to study the actual behaviour of investors in the financial markets. It analyses investor's social and cognitive psychology. Investors behave irrationally and make many regular errors and psychological biases do disturb investors' investment decision-making (Kamoune and Ibenrissoul, 2022). There can be overlapping cognitive and emotional biases; together called behavioural biases. Individuals usually make judgments and take decisions that are based on personal experiences, beliefs and preferences. They establish short cuts or heuristics which save time but keeps them away from rationality. The long-term perspective is also ignored. The only way to mitigate the impact of these biases is by becoming aware of them (Baker and Ricciardi, 2014). When studying investors and their decision-making criteria, many behavioural biases are largely interesting because they disclose the psychological influences that impact investor decisions, often leading to not so good choices. These biases can also give visions into how investors perceive risk, make investment decisions and adjust to market deviations.

Individual investors are more prone to behavioural biases than institutional investors. They emerging market investors suffer from behavioural biases like overconfidence, disposition effect and representativeness (Chen et al., 2007). Primarily all the cognitive biases, such as overconfidence, representativeness and herding biases, have a significant effect on the decisions in stock trading and investments made by Indian investors (Shukla et al., 2024).

The cognitive biases are a result of too much reliance on judgmental heuristics. These heuristics mainly include representativeness, availability and anchoring biases. For instance, even if people have proper knowledge of statistics, there exists a tendency to predict and give intuitive judgements, that best represent the data, without considering prior probability. Proper knowledge of the heuristics and related biases, could improve decisions and conclusions in conditions of doubt (Kahneman & Tversky, 1979). Anchoring bias, representativeness bias, loss aversion, overconfidence bias, optimism bias, and herding behaviour affect significantly the investor's decisions (Kartini and Nadha, 2021).

Among the different behavioural biases, Overconfidence bias is quite significant as well as popular in terms of available literature. It is a form of cognitive bias in which the person behaves as if they have more ability than they actually possess. They believe that they are better than they really are. An overconfident investor will place more

stress on his own knowledge, intuition or strategy then actually warranted by the available information or past happenings. In the financial context, overconfidence bias is a significant factor in arriving at investment decisions, risk assessment and market dynamics. Overconfidence can manifest as excessive trading volumes and poor return on investment for retail investors (Barber & Odean, 2000). Overconfidence can play a negative role by underestimating risk, inadequate portfolio diversification and ignoring professional advice. These findings highlight the need for further research into the psychological drivers of financial risk-taking, especially as behavioural biases like overconfidence continue to shape market outcomes (Chen et al., 2007).

Herd behaviour means when an investor copies the behaviour of other investors. Herding is influenced by investor's contacts within the financial markets and it describes their correlation in trading. They engage in such behaviour as it is easier to follow financial gurus or other successful investors. For these less experienced investors, it is difficult to gather expensive information and knowledge. Hence, we can conclude that this herding behaviour is actually a group of investors trading in the same direction over a period of time. This may ultimately result in behaviour patterns which are common among all individual investors and leading whole groups to make methodically wrong decision (Jaiswal et al., 2023). This is the most important factor in influencing the asset pricing and so cannot be overlooked. Individuals having inadequate knowledge of the financial markets, are predisposed to getting affected by this herd bias (Gupta et al., 2023).

There exists an inverse negative relationship with age in case of anchoring bias. The older investors are more sensitive to losses whereas younger investors tend to be over-concentrated on a specific reference point (Rai, 2024). Another explorable cognitive bias is disposition. Disposition effect means when people avoid actions that create regret and seek actions that cause pride. Shefrin and Statement (1985) state that this tendency causes investors to be predisposed to selling winners too early and riding losers too long. The prospect theory implies that there is risk aversion in the area of gains and risk seeking in the area of losses.

Through bibliometric analysis about the impact of behavioural biases on investor decisions we will try to uncover the emerging trends in articles and journal performance, collaboration patterns, and research constituents, and explore its intellectual structure. It will enable and empower researchers to gain a one-stop overview, identify knowledge gaps, drive novel ideas for investigation and position their intended contributions to this field (Donthu et al. 2021). A bibliometric analysis will help us in understanding the main types of biases which impact the investor decisions. Further, studying the literature and important keywords will give us a better overview of the specific biases which play a crucial role in moulding the retail investor's choices.

This paper will use biblioshiny and VOSviewer software for generating the scientific maps, which will be based on elements like keywords, authors, countries, journals, abstracts or cited references. It aims to conduct a bibliometric analysis of behavioural biases and retail investor decisions, explore existing publications and provide a comprehensive overview. Based on this methodology we try to answer following major research questions: (1) What is the scope of behavioural biases in the retail investments. (2) What are most prolific and most cited countries in this research; using "Biblioshiny" software. (3) Literature review of top relevant publications on impact of behavioural biases on investor decisions and providing the research gaps; using "Scopus" dataset. (4) Identifying research topics from a occurrence of keywords; through "VOSviewer" software. (5) Discussions are presented from the findings of past literature, research gaps and future research directions.

The remainder of the paper is organized as follows: Section 2 introduces the methodology, including data source, retrieval strategy, and bibliometric methods. The details are presented in Section 3 from three aspects, and the results are shown respectively. Section 4 presents a further discussion from the perspective of findings, research gaps and future trends. Section 5 ends the paper with some conclusions.

Research Methodology:

The dataset has been extracted from Scopus and the keywords in the search criteria were "Impact of bias on investor decisions" or "heuristics in retail investors", occurring at any place in "Article title, Abstract or Keywords" have been applied. The words "bias" and "heuristics" were used as it covers all the behavioural biases and the word "investor decisions" and "retail investors" will generate results of only those biases which are related to retail investment decisions.

The Scopus database returned 399 matches in our initial sample, as on 3rd April 2025 (Table 1). Then the research was restricted to document type of only "Article" and "review", language was limited to "English". The search returned 327 documents. The final query in Scopus was:

(TITLE-ABS-KEY (impact AND of AND bias AND on AND investor AND decisions) OR TITLE-ABS-KEY (heuristics AND in AND retail AND investors)) AND (LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))

The results are showing research articles from 1994 and the annual growth rate of the topic is 11.35. The average citations per document are 15.69 with author keywords score of 1056. The total number of authors are 876 with 2.94 co-authors per document.

Results of the analysis:

The results of the bibliometric analysis have been presented in following three subsections: publication and

citations, literature review of most relevant articles and co-occurrence analysis of most relevant terms.

Publication and Citation Structure:

Figure 1 shows the publication trends over a 20 years period of 1994 to 2024. The number of publications is less

than one during the period 1994-2006. Afterwards, publications reach 88 in the year 2024.

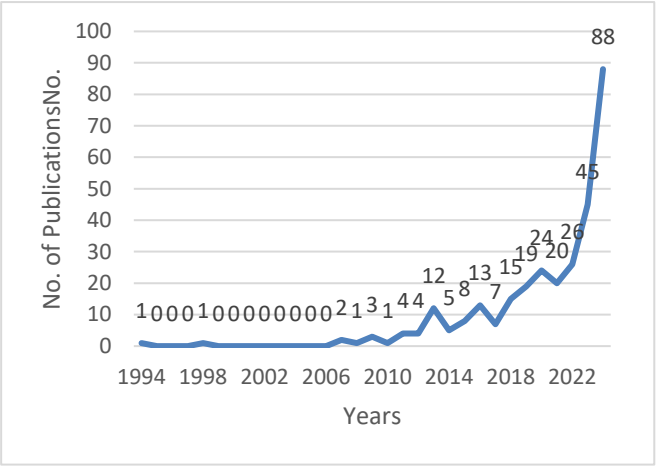

Figure 1. Annual number of publications on Impact of behavioural biases in retail investor decisions.

This has been due to advancements in behavioural finance research and growing recognition of the importance of psychological factors in financial decisions, leading to many interdisciplinary studies. Kahneman won the Nobel prize in economics 2002 for his work in psychological research. Further, Chartered Financial Analyst programs integrated behavioural content in their programs since 2012. With fluctuations and growing volatility in financial markets, there has been increasing research to better understand the relation between behavioural biases and decision-making of investors. There is a growing interest in tailoring financial advice to individual clients, based on individual biases.

Country	No. of publications	No. of citations
India	120	799
Pakistan	52	470
China	41	203
USA	31	420
Malaysia	27	145

Table 1: Most prolific countries

In table 1, the number of publications from each country are presented. Comparing these sources, the maximum number of publications (120) are from India, followed by Pakistan (52) and China (41). The contribution of countries based on number of citations of the publications are shown in figure 2. A total of 51 countries have contributed to this research field. In terms of citations, India (799) tops the list, followed by Pakistan (470). Though USA has low number of publications (31) but it's citations (420) are comparatively high.

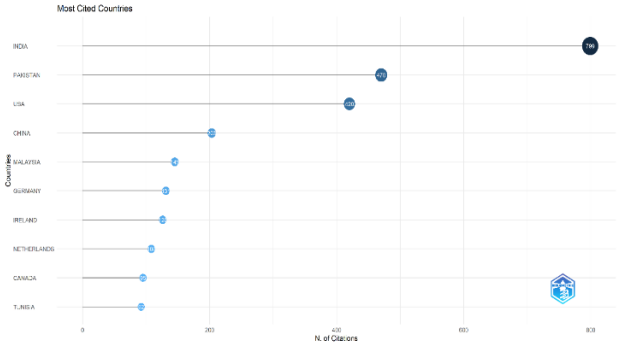

Fig. 2: Most cited countries

Literature Review of most relevant Publications:

A list of top relevant journal articles from the Scopus database has been made. Only two search criteria have been used; "impact of bias on investor decisions" or "heuristics in retail investors". The document type and language has been kept the same as mentioned previously in the data section.

Author	Journal	Findings	Research Gap
Adil et al. (2021)	Asian Journal of Accounting Research	Influence of herd bias & risk-aversion on investment decision was negative & statistically significant among male as well as female investors. Influence of overconfidence was positive and significant while influence of disposition was statistically insignificant among male investors. Effect of both overconfidence & disposition was statistically insignificant among female investors.	This research has been done Delhi NCR. Future research can be encouraged in other parts of the country with different populations, like professional investors. It can determine the extent to which other behavioural biases, like representativeness, anchoring, home bias, etc. affect investment decisions.
Mushinada & Veluri (2019)	Review of Behavioral Finance	Besides rationality, behavioural biases like self-attribution & overconfidence existed in an investor. A change in self-attribution also results in change in overconfidence and vice versa. Demographics of an investor (gender, age, occupation, annual income,	Future analysis can be done to examine the existence of behavioural biases based on both market level and individual account data simultaneously.

		trading experience) impact their behavioural biases.	
Pathak & Thapa (2024)	Investment Management and Financial Innovations	Overconfidence, representativeness, adjustments & anchoring biases significantly and positively influence investment decisions. Whereas, availability bias negatively impacts the investment decisions.	Future research can include institutional investors, which can provide a more comprehensive understanding of investor behaviour in the Nepalese stock market.
Suresh G. (2021)	FIIB Business Review	Heuristic bias had a significant positive association with the formation of biases in decision-making. Whereas framing effect, cognitive illusions and herd mentality have negative associations. Financial literacy of individual investors has a significant impact on affecting stock market investment decisions.	Other biases besides heuristics can be studied. Not just stock market investors, but mutual-fund and other investors can be considered.
Talwar et al. (2021).	Psychology Marketing, Wiley	Herding, hindsight, overconfidence, self-attribution & representativeness biases influence trading activity, with anchoring bias having a negative influence.	Narrow sample of male millennials can be broadened in terms of gender, as manifestation of biases get impacted from gender. Study can be conducted in other geographical areas besides Finland.
Ramesh et al. (2019)	Indian Journal of Finance	Investors' biases have a strong impact on the decision-making skills of women investors. Personality has a significant indirect effect on decision making skills through investors' biases.	The study was conducted on female investors in mutual funds, in the city of Chennai. The population can include other types of investors, especially when MF investors are considered to be variable.
Gamal & Wahba (2024)	Afro-Asian Journal of Finance and Accounting	Two classes of stock investors (informed and uninformed investors), are affected by emotional, cognitive, and behavioural biases. These lead to irrational decisions, depending on investor's level of financial knowledge.	Study is limited to Egyptian stock exchange, which can be broadened.
Gurung et al. (2023)	Investment Management and Financial Innovations	Overconfidence bias has notable influence on decisions of Nepalese investors. Anchoring & regret aversion showed significant influence. Herding had a negative impact and representativeness bias had an insignificant impact.	Future research can be conducted on influence of socio-economic and cultural factors on investors' decision-making processes.
Jaiyeoba et al. (2019)	International Journal of Bank Marketing	The results show that both institutional & retail investors in Malaysia are not same in terms of religious bias and herding behaviour. They behave in the same way with respect to overconfidence, representativeness & anchoring biases.	Both type of investors can also be compared regarding whether the influence of psychological biases is equally applicable to them, in terms of these studied biases & also other biases.
Bhandari et al. (2008)	Decision Support Systems	There exist cognitive biases (framing, representativeness & ambiguity) in individual investment decision making. Decision aids like feedback & graphs can significantly mitigate the influence of these biases.	Other biases can be studied and comparison can be made with decision aids & without the aids.
Jain et al. (2020)	Review of Behavioral Finance	This study was conducted on individual equity investors. It concluded that the most influential ones are overconfidence, herd behaviour and loss aversion.	More states can be included in the population, besides Punjab.

Singh et al. (2016)	Indian Journal of Finance	Men were found to be more overconfident and women more prone to self-attribution bias in their investment decisions. Gender is found to have no significant impact on the propensity to show overreaction, framing effect, and reference point bias.	Study is limited to NCR region and further study can be conducted in other geographical regions of India. For a more comprehensive assessment other behavioural biases like confirmation, herd behaviour, and hindsight bias can be included.
Yasmin & Ferdaous (2023)	Investment Management and Financial Innovations	Cognitive dissonance bias, regret aversion bias, loss aversion bias & illusion of control biases are the most important behavioral factors that affect investors, jointly explaining 55.63% cumulative variance.	The further prospect of study on Bangladeshi stock investors, can be to link it to financial literacy and to include more behavioural factors.
Jain et al. (2023)	Risks	Risk is inherent in each decision. It is assumed to be very low by the investors under the influence of heuristics. Risk perception acts as a very important mediator between behavioural biases and the investor's decisions.	Future research can deploy models like RNN, ANN, PLS-SEM. Investors can be divided into morning & evening traders. Similar study can be conducted on financial advisors & stock brokers. Future studies can incorporate variables like gender, religion, purpose of investing, etc.
Madaan & Singh (2019)	International Journal of Financial Research	Individual investors have limited knowledge and are more prone to making psychological errors. Overconfidence & herding bias have significant positive impact on investment decision. Anchoring & disposition effect also affect individual investor decisions.	Other biases can be studied which are not included in the present study and the impact of decisions of individuals and institutions on mutual funds can be investigated.
Saha & Kabir, (2024)	Global Business and Economics Review	Overconfidence and gambler's fallacy affect investors' decision-making, whereas conservatism, herding, availability, mental accounting, anchoring doesn't.	This is study on Bangladeshi investors, which can be extended to investors in other countries.
Qasim et al., 2019	Accounting	Investors' decisions were strongly influenced by herding bias & significantly by overconfidence bias.	In Pakistan, markets information is not equally available to everyone, which could have influenced the results. Such study can be conducted in other economies.
Abideen et al., 2023	Risks	Herding bias has a direct positive relationship on the investment decisions of investors. Overconfidence & disposition effect does not have a substantial influence on investment decisions.	Data collection can cover wider range of investors from different countries. A more comprehensive questionnaire (e.g., including some additional behavioural biases) can be designed.
Almansour et al. (2023)	Cogent Economics & Finance	Herding, disposition effect, and blue-chip bias have a significant positive impact on risk perception. Overconfidence has a significant positive effect on investment decisions, but not on risk perception. Risk perception is found to be significantly positively related to investment decisions. All four biases have a significant positive indirect effect on investment decisions through risk perception.	This study is conducted in Saudi Arabia & may not be generalizable to other cultures. Only four biases have been considered, so other biases can be studied in relation to investment decisions & risk perception.

Table 2: Most relevant articles for the impact of behavioural biases on retail investors

Analysis of Co-occurrence of Keywords using VOSviewer:

The co-occurrence analysis helps us in identifying the most relevant keywords in the research. The visualization of these co-occurrences represents the main topics of research in form of clusters where all the keywords are correlated.

The sample was first manually refined by using a thesaurus file, for merging synonyms (e.g. herding, herding bias and herding behavior) and for corrected spelling differences (e.g. behavioural bias and behavioral bias). The program selects keywords with value of minimum 5 observations that appear in the "title, abstract or keywords" of the paper, which gave the best result. Finally, unique terms of 30 keywords, 6 clusters and 167 links, with total link strength of 427 were obtained. The resulting co-occurrence visualization, through VOSviewer software has been presented in Fig. 3. The distance is proportional to the relatedness and the size of the node to its occurrence. The map has multiple connections and the clusters of the map can be associated with particular subtopics.

Cluster 1 is red in colour and gathers papers that describe "behavioural finance", which has 68 occurrences. It is followed by "heuristics" which has 20 occurrences. They are the most important biases in investment decision making. This cluster also includes terms like "investments", "decision making", "prospect theory", "investor sentiments", "stock market", "personality traits" and "home bias". Heuristics play an important role in decision making of investors in stock markets (Suresh G., 2021). Under the influence of heuristics, the investors are not able to perceive the amount of risk associated with the investment decision (Jain et al., 2023).

Cluster 2 is green in colour. It consists of "behavioural biases", having 49 occurrences, which are a part of behavioural finance and influence an investor's decisions. It is followed by "overconfidence bias" which has 39 occurrences; being the most important bias. "Herding bias" has 23 occurrences and other terms in the cluster are "anchoring bias", "disposition effect", "loss aversion" and "self-attribution bias". Overconfidence bias has a significant positive influence on investor decision making (Gurung et al. 2023; Madaan & Singh, 2019; Saha & Kabir, 2024; Qasim et al., 2019; Almansour et al., 2023). Effect of herd bias is significant but negative on investor decisions (Adil et al., 2021) and has a strong impact on trading activity (Talwar et al., 2021).

Cluster 3 is blue, with "investment decisions" at the centre, having 55 occurrences. It is followed by "risk" with 18 and "financial literacy" having 15 occurrences. Other terms used are "emerging markets" and "framing effect". Risk has a negative and significant influence on investor decisions (Adil et al., 2021) and plays an important role as a mediator between biases and investor decisions (Jain et al., 2023). There is growing awareness that financial literacy plays a very important role in investor decisions. It has a significant influence on individual stock market decisions (Suresh G., 2021).

Cluster 4 is yellow with "retail investor" (12), "individual investor" (11) and "cognitive biases" (10) having highest occurrences. They are followed by "covid 19" and "trading". This cluster connects the retail individual investors with the cognitive biases. Among cognitive biases like recency, familiarity, confirmation and overconfidence, few have high and others have low impact on financial behaviour of investors (Mohanty et al., 2024). Due to innate susceptibility of humans to cognitive biases; like herd mentality, overconfidence, and loss aversion; they can make poor decisions, increase market volatility and impact economic growth of an economy (Parashar et al., 2024).

Cluster 5 is colour purple and connects "market efficiency" (6), "investor behavior" (5) and "representativeness" (5). Representativeness bias is present in both retail and institutional investors (Jaiyeoba et al., 2019; Bhandari et al., 2008) and the bias has significant and positive influence on investment decisions (Pathak & Thapa, 2024) and trading activity (Talwar et al., 2021).

Cluster 6 is the last one in light blue colour. It has only one keyword "gender", with 5 occurrences. It has been studied as demographic variable under behavioural finance, behavioural biases, investments and financial literacy. Gender does impact the behavioural biases (Mushinada & Veluri, 2019). Infact biases like herd behaviour, overconfidence, disposition, as well as risk-aversion influence investment decisions of male and female investors in a different way (Adil et al., 2021). Males are also overconfident than females in terms of their knowledge about stock markets (Baker et al., 2018).

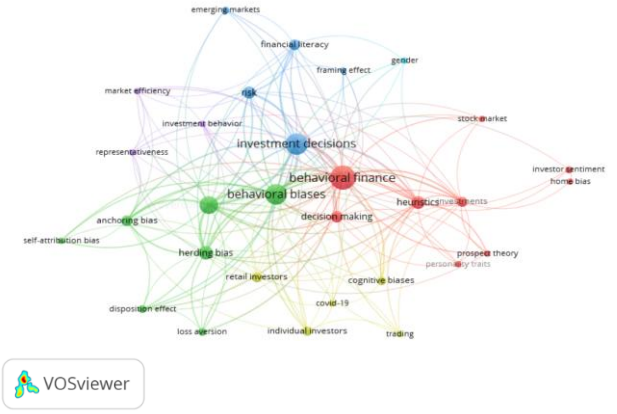

Fig. 3 Network Visualization of Co-occurring terms in publications (1994-Mar 2025)

Further research and research gap:

Further studies can be done to check the existence of behavioural biases based on both market level and individual account data simultaneously (Mushinada & Veluri, 2019). Institutional investors can also be included; which can provide a more comprehensive understanding of investor behaviour (Pathak & Thapa, 2024). Institutional & retail investors can be compared with respect to whether the influence of psychological biases is equally applicable to them (Jaiyeoba et al., 2019). Other behavioural biases can also be studied. A comparison can be made using feedback, graphs and other aids, with no aid situations (Bhandari et al. (2008). Biases can be

studied in relation to investor decisions & their risk perception. (Almansour et al., 2023). Financial literacy can be studied in-depth, linking it to investor decisions and behavioural aspects (Yasmin & Ferdaous, 2023).

Investors can be divided into morning & evening traders. Study can be conducted on financial advisors & stock brokers. Future studies can incorporate variables like gender, religion, purpose of investing, etc. (Jain et al., 2023). Future research can be conducted on influence of socio-economic and cultural factors on investors' decision-making processes (Gurung et al., 2023).

2. CONCLUSION:

Stock investors are affected by emotional, cognitive, and behavioural biases. These lead to irrational decisions, depending on investor's level of financial knowledge (Gamal & Wahba, 2024). Investors' biases have a strong impact on the decision-making skills of women investors. Personality has a significant indirect effect on decision making skills through investors' biases (Ramesh et al., 2019). Men are more overconfident and women more prone to self-attribution bias in their investment decisions. Gender is found to have no significant impact on the propensity to show overreaction, framing effect, and reference point bias. Singh et al. (2016). Personal characteristics of an investor such as gender, age, occupation, annual income & trading experience do influence their behavioural biases (Mushinada & Veluri, 2019).

We can conclude that, among individual investors, herding, loss aversion bias & overconfidence have the highest impact on the choices (Jain et al., 2020). Biases like overconfidence, representativeness, adjustments & anchoring biases significantly and positively influence investment decisions (Pathak & Thapa, 2024). Herding, hindsight, overconfidence, self-attribution & representativeness biases influence trading activity, with anchoring bias having a negative influence (Talwar et al., 2021). Decision aids like feedback & graphs can significantly mitigate the influence of these biases (Bhandari et al., 2008).

Financial literacy of individual investors has a significant impact on investment decisions (Suresh G., 2021) and risk perception plays a crucial role as a mediator between biases and investor decisions (Jain et al., 2023). Herding, disposition effect, blue-chip and overconfidence bias have a significant positive effect on investment decisions through risk perception (Almansour et al., 2023). Risk is inherent in each decision which is perceived to be very less by the investor under the influence of behavioural biases. Individual investors have limited knowledge and are more prone to making psychological errors (Madaan & Singh, 2019).

We can conclude that most of the biases which are important in decision making of retail investors are cognitive biases. Overconfidence, herd behaviour, disposition effect, availability and anchoring biases have been studied by many researchers. It can be concluded that these biases definitely influence the investors and their choices

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