

Information Processing Biases and Retail Investor Rationality: An analysis across Income Groups

Dr Jain Rani S

*Assistant professor, Department of Commerce,
Fatima Mata National College, Kollam, Kerala
Email- jainjmjm@gmail.com*

Dr Jency. S

*Post Doctoral Fellowship scholar
University of Kerala
Palayam, Thiruvananthapuram, Kerala*

Abstract

Information processing biases refer to systematic cognitive predispositions that occur when individuals perceive, interpret, appraise, and integrate information during decision-making under conditions of uncertainty. The present study examines whether information processing biases—namely anchoring, availability, conservatism, and framing—significantly influence investors across different income groups. Primary data were collected from 390 investors using a structured questionnaire. The data were analysed using SPSS Statistics Version 20, and the Chi-square test was employed to examine the association between investors' income levels and the prevalence of information processing biases.

The findings reveal that anchoring bias is the most dominant information processing bias affecting the majority of investors, followed by conservatism bias and the framing effect, while only a small proportion of investors exhibit availability bias. The results indicate that information processing biases remain prevalent in investors' decision-making behaviour irrespective of income levels.

The study highlights the importance of strengthening investor education and awareness programmes and encouraging a long-term investment perspective rather than short-term approaches, in order to promote more rational retail investment decisions.

Keywords: Information processing biases, anchoring bias, Conservatism bias, Framing effect, Availability bias.

Introduction

Investor behaviour is considered one of the most important themes in contemporary financial research, as the participation of retail investors in capital markets has been increasing steadily. (Barber & Odean, 2013). Retail investor participation in the Indian stock market has increased in recent years due to improved digitalisation, online trading platforms, and broader financial inclusion and it leads to greater market access for individual investors across income and

geographic segments. This growing demand has highlighted the necessity to understand retail investor behaviour for the sake of market efficiency and stability.

Traditional finance believes that investors' decisions are rational, and they will process all the information to maximize the return by considering the risk-return characteristics of investments. (Fama, 1970). However, empirical evidence undermines this view by demonstrating that investors frequently depart from rational norms (Thaler, 1999) and often rely on emotions, subjective judgments, and intuition, leading them to deviate from optimal decision-making (Kahneman & Tversky, 1974). These deviations led to the emergence of a new field behavioural finance, which include psychological tendencies that shape how investors collect, interpret, and respond to financial information (Shefrin, et.al., 2000).

Cognitive biases, particularly those related to information processing, have been shown to exert a dominant effect on investment behaviour (Barberis & Thaler, 2003). Anchoring, availability, framing, and conservatism biases affect investors' perceptions of risk, asset valuation, market sentiment, and portfolio composition, thereby generating persistent misjudgements and belief inflexibility. (Tversky & Kahneman, 1981).

Existing research has concentrated largely on demographic characteristics—such as age, gender, financial literacy, and investment experience—while socio-economic factors such as income, education, occupation, and household wealth remain relatively underexplored in the academic literature (Pompian, 2011). Income, in particular, may affect investors' access to financial information, analytical tools, and professional advice, thereby shaping their reliance on heuristics under conditions of uncertainty (Ackert & Deaves, 2010). This raises questions about whether income influences the intensity or likelihood of information-processing biases and whether such biases vary systematically across income groups (Baker & Ricciardi, 2014).

Addressing this gap, the present study investigates the association between income and four prominent cognitive biases—anchoring, availability, framing, and conservatism—among retail investors. By analysing how these biases fluctuate across specific income categories, the study contributes to a deeper understanding of behavioural heterogeneity and investor rationality in capital markets.

Literature review

Decision making is a complex phenomenon. In the economic and financial context, it is even more complex because of uncertainty and information overload (Simon, 1990). Traditional economic theories demonstrate that financial decision-making is based on rational choice theory, wherein investors are assumed to systematically process all available information to maximize expected utility. However, behavioural scientists challenge this assumption by arguing that individuals rely on heuristics or mental shortcuts and emotions, which may lead to systematic deviations from rationality (Kahneman & Tversky, 1974).

Behavioural finance is the study of investors' psychology in the process of making investment decisions. It examines how individuals interpret and act upon information while making investment choices (Lintner, 1965). In reality, investors often deviate from rational behaviour and base their decisions on various factors such as information, awareness, risk tolerance, emotions, personal qualities, mood, and expectations (Bodie, Kane, & Marcus, 2007). Among these factors, information processing biases such as anchoring bias, availability bias, frame bias and conservatism bias has significant impact on investors decision making.

Anchoring Bias

Anchoring refers to cognitive tendency of the individuals to rely heavily on an initial piece of information when making decisions and then they adjust up and down to reflect subsequent information and analysis. (Tversky & Kahneman, 1979). It is considered to be one of the most important information processing biases which influence the financial decision making of investors. The investors tend to rely or anchor on past prices to predict the current price of a stocks and this leads to biased decision making. (Shiller, 2000)

Anchoring bias positively influence the investors investment decision. Empirical evidence from Kenya and Colombo Stock exchange indicated that the investors choices are influenced by their past performance experience. (Mwangi, et al., 2014). The behavioural factors such as herding, heuristics, prospects and market influence the investors investment decision and among them anchoring heuristic has high influence compared to herding. (Kengatharan, et al., 2014). In contrast to this, the studies from Chi Minh Stock exchange indicate that forecasting future stock prices based on recent prices has only a moderate impact on investment. (Ngoc, 2014). Al Rahahleh (2024) conducted a study among Saudi investors by considering overconfidence as a mediating factor and found that anchoring bias increases the irrational investment and the frequent traders are more prone to these biases compared to infrequent traders.

While considering the socio- demographic variables of investors like gender, age, education and training experience it was found that age and anchoring biases of Indian investors are negatively correlated. Young investors are more prone to anchoring bias on some specific reference point while making investment decision (Rai, 2024). Empirical evidence demonstrates that anchoring biases influence various aspects of financial decision-making including investment decision, pricing and valuation decisions and risk assessment (Wang, 2025). As far as gender wise considered Matsumoto et.al (2013) identified that there was no statistically significant gender difference among investors although female investors were slightly more anchored.

Availability Bias

Availability bias is a mental shortcut which is used by the people while judging the frequency or probability of events. When people judge the likelihood of events based on how easily examples come to mind rather than on objective probabilities resulting in systematic errors in judgement (Tversky, et al ., 1973).

Availability heuristic influences the retail investors stock selection and trading behaviour. Empirical evidence from Indian stock markets suggests that investors rely more on recent news social media and peer discussions rather than fundamental analysis (Mer, et al., 2023). In addition, this heuristic significantly predicts both short term and long-term equity return. Stocks that receive great attention due to news, visibility or recent price movements experience stronger demand and abnormal returns. But all these price effects are temporary and it will be corrected over time (Xie, et al., 2023).

Availability biases increase investors willingness to take risk which in turn affects their investment decisions (Salman, et al., 2021). Investors who rely on easily accessible information tenet to perceive investments as either less risky or more attractive than they actually are. And availability heuristic indirectly affects investment decision making through risk perception (Jain, et al., 2023). The studies consistently suggests that investors with more risk tolerance have more likely to act on readily available information such as news of crises or sensational events and it often leading to irrational investment decisions (Lie, et al., 2025, Sundirman, et al., 2023).

Wikartika, et al., 2023 demonstrated that while making investment decision young investors tend to relay more on easily available information rather than conducting fundamental analysis. Sachan, et al., (2020), claimed that a person belonging to rural areas has higher probability to be susceptible to availability bias rather than urban areas. This is due to lower per capita income and lower cushion to absorb financial losses and the cost of being biased is very high. Education and financial literacy moderate the effect of availability bias in investment decision (Hanif, et al., 2025). However, studies from Gen Z investors in Pontianak city found that even financially literate and confident investors may still make decision based on prominent or recent information rather than fundamental analysis (Utari, et al., 2025).

Conservatism bias

A Conservatism bias means that investors too slow in updating their beliefs in response to new evidence. It is a mental process in which people cling to their prior views of forecasts at the expense of new information (Pompian, 2011). Empirical evidence from Taiwan stock market reflect that investors were found to underreact to earnings announcements even when firms exhibited sustained high or low EPS growth (Wu, et al., 2009). Similarly, Rahim, et al., (2019) argued that conservatism biases have positive impact on investment decisions of Pakistani stock exchange investors. However, Conservatism biases negatively correlated with the financial behaviour of salaried investors and therefore the high-income salaried investors are less prone to this bias and improve their investment behaviour (Mulasi, et al., 2023).

Demographic profile of the investors also plays a significant role in conservatism bias. Empirical evidence from the individual investors of KMI 30 index at Pakistan stock exchange found that conservatism bias is more common in highly educated people especially those with graduate and doctoral degrees. Younger investors that are in between age group of 18 to 25 are less susceptible to conservatism biases than each group between 26 to 30. Moreover, the trading experience of the investors increases the conservatism bias (Gul, et al., 2023).

Framing bias

Framing refers to the way a problem is posed for the decision maker. If information is presented positively, it is received easily than negatively stated information even if the both have neutral effects (Ritter, 2003). People tend to avoid risk when a positive frame is present but seek risks when a negative frame is presented (Tversky, et al., 1981). It shows that investors evaluate outcomes related to a reference point and their risk preferences change depending on whether outcomes are presented as gains or losses (Kahneman, 1979).

Empirical evidence from Colombo Stock exchange indicated that Framing biases have significant effect on investment decision it caused investors decision to change depending on how information was presented (Shalika, et al., 2025). A common finding across studies is that framing biases cannot be fully understood without considering emotional process. People's immediate emotional reactions to those framed options determine how they interpret an act on information (Stark, et al., 2017, Druckman, et al., 2008). Positive emotion reduced the framing effect leading to more balanced risk taking and negative emotions amplified the framing effect and this increasing extremes in risk preferences (Seo, et al., 2010).

Another study argued that the investors response differs under bullish and bearish frame. Positive framing during bullish period increased their willingness to invest while the same information in a bearish frame led to risk averse (Rahayu, 2017). Framing also affects both portfolio selection and timing of investments. Loss framed options led investors to hold losing assets for a longer period while gain framed options encouraged selling winners early. As far as gender wise considered men consistently displayed higher risk tolerance while women

preferred risk averse choice across all frames (Chishti, et al., 2025). Further studies also indicated that framing and personality traits of individual investors also influence the investment decision. An investor with the high score of agreeableness has higher probability of having framing biases (Sachan, et al., 2023).

Income and Information processing bias

Income is one of the meditating factors which influence the investors investment decision. Demographic factors such as age, education and investment experience interact with income collectively shaping bias intensity (Farrugia.,2024). Income reduces the intensity of behavioural biases rather than eliminating them (Kumar et al.,2016). Higher and lower income investors exhibit different sensitivities to these biases (Herlianti, et al.,2025).

Empirical evidences from the study conducted by the researchers argued that, low-income investors are more susceptible to behavioural biases such as anchoring, availability and herding and this is due to limited access to financial information whereas high income investors are less prone to these biases. (Sinha, et al.,2023, Isidore, et al., 2019).

High income investors comparatively show less anchoring, framing and other heuristic biases (Herlianti, et al.,2025). Low-income investors exhibit stronger behavioural biases especially overconfidence, herding and anchoring. This is due to limited financial resources and lower access to professional advice make these investors more dependent on heuristics and informal information sources (Kumar et al.,2016).

Another study from Taylor et al., argued that lower- and middle-income consumers are more susceptible to cognitive biases especially to anchoring and framing due to higher sensitivity to perceived gains and losses. Similarly, another study from Maltese investment context evidenced that, low-income investors are more sensitivity to anchoring and availability biases due to easily available information whereas high income investors are less prone to these biases due to their analytical thinking (Farrugia.,2024).

The results consistently suggest from the evidence obtained from Indonesia investors lower income investors are found to rely heavily on easily accessible, recent and widely published information such as media narratives and peer discussions due to limited access to professional advice however high-income investors demonstrate relatively low level of availability bias as greater financial resources enable to access diversified information sources and expert consultation (Raj, et al.,2024)

Numerous studies in behavioural finance have extensively examined the rationality versus irrationality of investors in their investment decision-making processes. These studies have identified various behavioural biases from different perspectives; however, there is limited integration of key information-processing biases—such as anchoring bias, availability bias, conservatism bias, and the framing effect—within a single analytical framework. Moreover, the existing empirical evidence is largely drawn from developed markets, with relatively few region-specific studies, particularly in the context of Kerala. In addition, although socio-economic variables such as age, gender, and income are often considered, only a limited number of studies have specifically examined the relationship between income and information-processing biases. Furthermore, the rapid expansion of digital trading platforms, the growing influence of social media-based information, and the emergence of finfluencers and robo-advisors have significantly transformed the information environment of investors. These gaps collectively highlight the need for a holistic, region-specific, and income-based behavioural analysis of information processing biases among retail investors, thereby providing the rationale for the present study. These structural shifts in information availability

and transmission may intensify or alter behavioural biases in investment decision-making. Consequently, there exist a clear research gap for region-specific, and income-based behavioural analysis of information-processing biases among retail investors, thereby providing a strong rationale for the present study.

Objectives

Objective of the research endeavour is to examine if the information processing biases such as anchoring, availability, conservatism and framing effect exert a substantial impact on income levels. Understanding the connection between these information processing biases and levels of their income provide valuable insights into personal financial decisions that may provide clues to the underlying causes of income inequality.

Research Question

Are there significant differences in information processing bias such as anchoring bias, availability bias, conservatism bias and framing effect among investors based on their income levels?

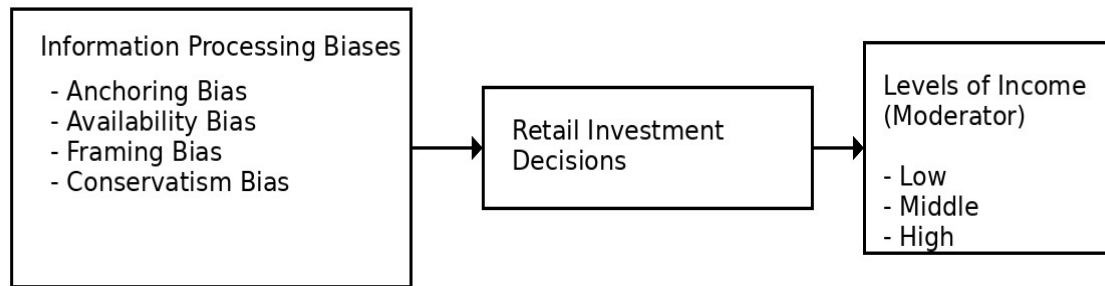


Figure 1: Research framework

Hypothesis of the study

Based on the research framework, the following hypothesis were formulated

The Information processing biases of investors belonging to various income strata are not significantly different.

Methodology

The study adopts a descriptive and analytical approach, utilizing primary data gathered through questionnaires. The questionnaire comprises two segments. The first segment focuses on gathering fundamental demographic profile, incorporating age, gender, occupation, and income. Meanwhile, the second part is tailored to evaluate investors' levels of information processing biases, such as anchoring bias, availability bias, conservatism bias and framing effect, in their decision-making regarding investments.

The study focuses on investors in Kerala. 390 investors were included in the total sample size. The investors were selected using a purposive sampling technique. A total of 130 individuals were included in the study, representing three income groups: 130 from low income, 130 from middle income, and 130 from high income.

SPSS (Version 20) was utilized to tabulate and analyse the primary data in accordance with the study's objectives. Whenever necessary, analysis involved the use of mathematical and statistical tools. The chi-square test is an important nonparametric test for comparing multiple

variables with randomly selected data. Based on the null hypothesis, the expected frequencies are computed. Differences between the actual and expected values determine whether the null

Results and Discussion

A. Profile of sample respondents

As indicated by the table, the age group of 35–49 years had the most respondents (37.30%). This was followed by the age group below 35 years (31.80%). In terms of gender, 78.50% of the respondents were male, and the rest were female. The occupation sample was uniformly selected from both salaried and non-salaried categories. The sample was comprised of three income groups: low income, middle income, and high income, with a composition of 33.33%. Low income is defined as monthly income below 30,000, middle income is defined as monthly income between 30,000 and 80,000, and high income is defined as monthly income above 80,000.

Table 1

Distribution of sample by their personal characteristics

Characteristics		n	%
Age	Below 35	124	31.80
	35-49	146	37.40
	50 and above	120	30.80
Gender	Male	306	78.50
	Female	84	21.50
Occupation	Salaried	195	50.00
	Non-salaried	195	50.00
Income	Low	130	33.30
	Middle	130	33.30
	High	130	33.30
Total		390	100.00

Source: Primary data

B. Information processing biases of investors

Information processing biases refers to systematic cognitive predispositions that occur when individuals perceive, interpret, appraise and integrate information in the process of decision making under conditions of uncertainty. These biases arise because investors have bounded rationality – they possess limited cognitive capability, incomplete information and time constraints. (Simon, 1990). Behavioural finance argues that, investors do not process information objectively instead they rely on heuristics that often lead to irrational investment decisions. (Tversky et.al., 1974). These errors are known as Information processing bias.

The following were the four Information processing biases studied:

a. Anchoring Bias:

Anchoring bias refers to a human tendency to rely too heavily on one trait or piece of information when making decisions. It was found out by the following question “*Suppose, you decided to purchase a share for Rs 500 per share. But suddenly the price increases from 500 to 550. Then what is your decision*” The option ‘Purchase it at the price of Rs 550’ represents unbiased and ‘Wait to lower the price to Rs 500 or below’ represents biased

Table 2 depicts the distribution of investors exhibiting anchoring bias across different income groups. The respondents are classified into low, middle-, and high-income categories, with each group consisting of 130 investors. The results reveal that a majority of investors (67.18%) exhibited anchoring bias, while only 32.82% were found to be unbiased.

Among the income groups, high-income investors reported the highest percentage of anchoring bias (67.69%). This was followed by both middle- and low-income investors, each recording 66.92% of anchoring bias. To examine whether income level had a significant influence on anchoring bias, a chi-square test was applied. The results indicate that there was no statistically significant difference in anchoring bias across income groups, as the p-value was greater than the 0.05 level of significance ($p = 0.988$). This suggests that anchoring bias is uniformly distributed across income groups and does not significantly vary with income.

It can therefore be concluded that the majority of investors are subject to anchoring bias. Although high-income investors exhibited a marginally higher percentage of anchoring bias, income level does not significantly influence the presence of anchoring bias in investment decision-making.

Table 2

Distribution of investors with status of having Anchoring bias by their income

Characteristics		N	Anchoring bias				Chi-square	p
			Unbiased		biased			
			n	%	n	%		
Income	Low	130	43	33.08	87	66.92	0.023	0.988
	Middle	130	43	33.08	87	66.92		
	High	130	42	32.31	88	67.69		
Total		390	32.38		67.18			

Source: primary data

b. Availability Bias

The availability bias is a rule of thumb, or mental shortcut, that allows people to estimate the probability of an outcome based on how prevalent or familiar that outcome appears in their lives. The availability bias was identified from the response of the investor to the question “Suppose, you have some money to invest and you hear about a great stock tip from your neighbour, who is known to have a good stock market sense. He recommends you purchase shares in ‘X’ a company. What is your response to this situation?” The option ‘likely to buy some shares because my neighbour is always right’ is biased and the option ‘likely to have it under advisement and go back to my house and do further research before making a decision’ is unbiased.

The results from Table 3 revealed that a majority of investors (80.77%) were not affected by availability bias, while only 19.23% of the investors exhibited availability bias. Among the income groups, middle-income investors recorded the highest percentage of availability bias (23.08%). This was followed by high-income investors (19.23%) and low-income investors (15.38%). To examine whether income level had a significant influence on availability bias, a chi-square test was applied. The results reveal that there was no statistically significant difference in availability bias across income groups, as the p-value was greater than the 0.05 level of significance ($p = 0.290$). This indicates that availability bias is not significantly associated with income level.

Table 3

Distribution of investors with status of having Availability bias by their income

Characteristics		N	Availability bias				Chi-square	p
			Unbiased		biased			
			n	%	n	%		
Income	Low	130	110	84.62	20	15.38	2.476	0.290
	Middle	130	100	76.92	30	23.08		
	High	130	105	80.77	25	19.23		
Total		390	315	80.77	75	19.23		

*Source: primary data***c. Conservatism bias**

Conservatism bias refers to the tendency to revise one's belief adequately when presented with new evidence. The following statement 'I don't easily change my views about something once they were made' was used to measure the level of agreement. Five-point scale was used for analysis, where 'one' denoted strongly disagree and 'five' the maximum. Where the level of agreement was above '3' the investors were biased and '3' and below were unbiased.

The results reveal that a majority of investors (57.18%) exhibited conservatism bias, while 42.82% were found to be unbiased. As far as income wise considered, low-income investors reported the highest percentage of conservatism bias (64.62%). This was followed by high-income investors (56.92%) and middle-income investors (50.00%). To examine whether income level had a significant influence on conservatism bias, a chi-square test was applied. The results indicate that the association between income level and conservatism bias is not statistically significant at the 5% level, as the p-value is marginally greater than 0.05 ($p = 0.059$). This suggests that although variations in conservatism bias are observed across income groups, these differences are not statistically significant.

It can be inferred that a majority of investors are subject to conservatism bias. While low-income investors exhibited a relatively higher tendency toward conservatism bias, in investment decision-making.

Table 4

Distribution of investors with status of having Conservatism bias by their income

Characteristics		N	Conservatism bias				Chi-square	p
			Unbiased		biased			
			n	%	n	%		
Income	Low	130	46	35.38	84	64.62	5.676	0.059
	Middle	130	65	50.00	65	50.00		
	High	130	56	43.08	74	56.92		
Total		390	167	42.82	223	57.18		

*Source: primary data***d. Loss framing bias**

The framing effect is cognitive bias, in which people react to a particular choice in different ways depending on how it is presented; e.g. as a loss or as a gain. People tend to avoid risk when a positive frame is presented but seek risks when a negative frame is presented.

Here, investors were asked to select an option ‘Imagine that you win Rs 3, 00,000 and you invested that amount and later you were compelled to choose an option’. The options given were, Option 1 ‘sure loss of one lakh’ and option 2 ‘50% chance of loss 2 lakh and 50% chance to loss nothing’. The first option represents unbiased and the second option represents unbiased

From the table 5 indicate that a majority of investors (60.77%) exhibited loss framing bias, while 39.23% were found to be unbiased. Across the income groups, both low and high-income investors reported an identical percentage of loss framing bias (61.54%). Middle-income investors exhibited a slightly lower percentage of loss framing bias at 59.23%. To examine whether income level had a significant influence on loss framing bias, a chi-square test was applied. The results reveal that there is no statistically significant association between income level and loss framing bias, as the p-value is considerably higher than the 0.05 level of significance ($p = 0.908$). This indicates that loss framing bias is uniformly distributed across income groups and does not significantly vary with income level.

It can therefore be concluded that the majority of investors are influenced by loss framing bias. However, income does not play a significant role in determining the presence of loss framing bias in investment decision-making.

Table 5

Distribution of investors with status of having Loss framing bias by their income

Characteristics		N	Loss framing bias				Chi-square	p
			Unbiased		biased			
			n	%	n	%		
Income	Low	130	50	38.46	80	61.54	0.194	0.908
	Middle	130	53	40.77	77	59.23		
	High	130	50	38.46	80	61.54		
Total		390	153	39.23	237	60.77	390	

Source: primary data

C. Status of investors having Information Processing biases by level of income

It was clear from the Table 6 anchoring bias is the most prevalent information processing bias among investors, affecting 67.18% of the total sample. This bias is consistently high across all income groups, with 66.92% of low- and middle-income investors and 67.69% of high-income investors exhibiting anchoring bias. Loss framing bias is the second most dominant bias, observed among 60.77% of investors, with similar proportions across income categories.

Conservatism bias is present among 57.18% of investors, with low-income investors showing the highest incidence (64.62%), followed by high-income (56.92%) and middle-income investors (50.00%). In contrast, availability bias is the least prevalent information processing bias, affecting only 19.23% of the total respondents. Middle-income investors reported a relatively higher level of availability bias (23.08%) compared to low- and high-income groups.

To examine whether income level significantly influences the distribution of information processing biases, a chi-square test was applied. The chi-square value of 4.243 with a significance value of 0.644 indicates that there is no statistically significant association between

income level and the presence of information processing biases. This suggests that these biases are uniformly distributed across income groups and do not significantly vary based on income.

Table 6

Distribution of investors having Information processing biases by level of income

Information processing biases	Income						Total	
	Low		Middle		High			
	n	%	n	%	n	%	N	%
Anchoring bias	87	66.92	87	66.92	88	67.69	262	67.18
Availability bias	20	15.38	30	23.08	25	19.23	75	19.23
Conservatism bias	84	64.62	65	50.00	74	56.92	223	57.18
Loss framing bias	80	61.54	77	59.23	80	61.54	237	60.77
Chi-Square	4.243							
Sig.	0.644							

Source: primary data

Testing of hypothesis

Hyp: The Information processing biases of investors belonging to various income strata are not significantly different.

The objective of the analysis was to examine the variance in information processing biases of investors with respect to their income levels. The results indicate that there is no significant difference among income strata with regard to anchoring bias, availability bias, conservatism bias, and loss framing bias. Since the p-values for all these biases exceed the 5 per cent level of significance, the null hypothesis is accepted in all cases. This implies that income does not have a significant influence on the information processing biases of investors. Accordingly, the null hypothesis is found to be applicable for all the selected information processing biases, confirming that investors across different income groups exhibit similar patterns of information processing behaviour in investment decision-making.

Table 7

Information processing biases pertaining to income

Sl No	Information processing biases	Income (p value)	Decision
1	Anchoring bias	0.988	Accept
2	Availability bias	0.290	Accept
3	Conservatism bias	0.059	Accept
4	Loss framing bias	0.908	Accept

Source: primary data

Conclusion and Recommendation

The focus of the study was to examine whether information processing biases—namely anchoring, availability, conservatism, and framing—noticeably influence investors across different income groups. The findings reveal that anchoring bias is the most dominant information processing bias, affecting the majority of investors, followed by conservatism bias and the framing effect, while only a small proportion of investors exhibit availability bias.

Although the empirical results indicate no statistically significant income-wise differences in the prevalence of these biases, high-income investors tend to be more prone to anchoring and loss framing biases, whereas low-income investors demonstrate a relatively higher tendency toward conservatism and loss framing biases. Overall, information processing biases remain prevalent regardless of income level. Therefore, the study highlights the need for improved investor education and awareness programmes, as well as the promotion of long-term investment perspectives over short-term approaches, to promote more rational retail investment decisions.

Practical implication

Financial advisors can utilise these findings to adjust investment strategies according to clients' income levels. Policymakers may generate the results to design and implement targeted financial literacy programmes focused at alleviating the impact of behavioural biases. Similarly, financial institutions can evolve and offer financial products that more accurately reflect the behavioural characteristics and decision-making patterns of different income segments.

Reference

1. Ackert, L. F., & Deaves, R. (2010). *Behavioral finance: Psychology, decision-making, and markets*. South-Western Cengage Learning.
2. Al Rahahleh, N. (2024). The influence of anchoring and overconfidence on investment decision-making in the Saudi stock market: A moderated mediation model. *Review of Middle East Economics and Finance*, 20(1), 45–75. <https://doi.org/10.1515/rmeef-2023-0015>
3. Barber, B. M., & Odean, T. (2013). The behavior of individual investors. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the economics of finance* (Vol. 2, pp. 1533–1570). Elsevier.
4. Barberis, N., & Thaler, R. (2003). A survey of behavioral finance. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the economics of finance* (Vol. 1, pp. 1053–1128). Elsevier.
5. Bodie, Z., Kane, A., & Marcus, A. J. (2007). *Investments* (7th ed.). McGraw-Hill/Irwin.
6. Chishti, M. F., & Ghouri, A. M. (2025). Behavioral biases and investment decision-making. *Cogent Economics & Finance*, 13(1), Article 10-1080.
7. Druckman, J. N., & McDermott, R. (2008). Emotion and the framing of risky choice. *Political Behavior*, 30(3), 297–321.
8. Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383–417.
9. Farrugia, A. (2024). *Behavioural biases in investment decision-making: A study on the impact of demographic factors within the Maltese context* (Master's thesis, University of Malta).
10. Gul, M., & Rahim, A. (2023). Post COVID-19 analysis of conservatism effect bias on individual investors of the KMI-30 Index at Pakistan Stock Exchange. *The Regional Tribune*, 2(1), 17–30.
11. Hanif, S., Ullah, K., & Aftab, R. (2025). Personality traits, availability bias, risk attitude and investment decisions: Moderating role of financial literacy and gender. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.5290294>
12. Herlianti, E., Supriyatna, Y., & Purnamasari, I. (2025). Cognitive biases in investment decision: Do education and income make a difference? *Dinamika Pendidikan*. <https://doi.org/10.15294/dp.v19i2.20991>

13. Isidore, R. R., & P, C. (2019). The relationship between income and behavioural biases. *Journal of Economics, Finance and Administrative Science*, 24(47), 127–144.
14. Jain, J., Walia, N., Singla, H., Singh, S., Sood, K., & Grima, S. (2023). Heuristic biases as mental shortcuts to investment decision-making: A mediation analysis of risk perception. *Risks*, 11(4), 72.
15. Kahneman, D. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica*, 47, 263–291.
16. Kengatharan, L., & Kengatharan, N. (2014). The influence of behavioral factors in making investment decisions and performance: A study on investors of Colombo Stock Exchange, Sri Lanka. *Asian Journal of Finance & Accounting*, 6(1), 1.
17. Kumar, S., & Goyal, N. (2016). Evidence on rationality and behavioural biases in investment decision making. *Qualitative Research in Financial Markets*, 8(4), 270–287.
18. Lei, X. (2025). Availability heuristic, risk tolerance, and investment decision making: A behavioral perspective. *Highlights in Business, Economics and Management*, 58, 88–95. <https://doi.org/10.54097/c5k0yw82>
19. Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics*, 47(1), 13–37.
20. Mardiana, R., Yossinomita, Y., Saputra, M. H., Mandasari, R., & Kartika, Y. D. (2025). Behavioral bias (availability, representativeness, anchoring, and confirmation) toward investment decision-making. *Journal of Management: Small and Medium Enterprises (SMEs)*, 18(1), 399–412.
21. Matsumoto, A. S., Fernandes, J. L., Ferreira, I., & Chagas, P. C. (2013). Behavioral finance: A study of affect heuristic and anchoring in decision making of individual investors. *SSRN Electronic Journal*. <https://ssrn.com/abstract=2359180>
22. Mer, P., & Vishwakarma, P. (2023). The impact of heuristics bias on investment decision: An empirical study. *SSRN Electronic Journal*. <https://ssrn.com/abstract=4874264>
23. Mulasi, A., Jain, M., & Desai, K. (2023). Predicting the financial behavior of Indian salaried-class individuals. *Investment Management & Financial Innovations*, 20(1), 26.
24. Murithi, D. K. (2014). *The effect of anchoring on investment decision making by individual investors in Kenya* (Unpublished master's thesis). School of Business, University of Nairobi, Kenya.
25. Mwangi, G. G., Waweru, N. M., & Parkinson, J. M. (2014). Behavioural factors influencing investment decisions in the Kenyan property market. *Afro-Asian Journal of Finance and Accounting*, 4(1), 26–49.
26. Ngoc, L. T. B. (2014). Behavior pattern of individual investors in stock market. *International Journal of Business and Management*, 9(1), 1–6. <https://doi.org/10.5539/ijbm.v9n1p1>
27. Pompian, M. M. (2011). *Behavioral finance and wealth management: How to build optimal portfolios that account for investor biases*. John Wiley & Sons.
28. Rahayu, C. W. E. (2017). The influence of information framing towards investors' reaction in bullish and bearish market conditions: An experiment. *Jurnal Dinamika Manajemen*, 8(2), 199–207.
29. Rahim, A., Shah, M. H., & Aamir, A. (2019). Impact of conservatism bias effect on investment decisions of Pakistani stock investors. *City University Research Journal*, 9(1).
30. Rai, R. (2024). Behavioural biases and investment decision-making in India: A study of stock market investors. *International Research Journal of Economics and*

- Management Studies*, 3(11), 11–24. <https://doi.org/10.56472/25835238/IRJEMS-V3I11P102>
31. Raj, M., & Bhattacharya, M. (2024). Behavioral analysis of sustainable and impact investment decisions: The role of availability bias among different age and income groups. *BSSS Journal of Commerce*, 16(1), 30–55.
 32. Ritter, J. R. (2003). Behavioral finance. *Pacific-Basin Finance Journal*, 11(4), 429–437.
 33. Sachan, A., & Chugan, P. K. (2020). Availability bias of urban and rural investors: Relationship study of the Gujarat State of India. *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport*, 8(1), 1–6.
 34. Sachan, A., & Chugan, P. K. (2021). Relationship between framing bias and Big Five personality traits of individual investors. *Towards Excellence*, 13, 665–676.
 35. Salman, M., Khan, B., Khan, S. Z., & Khan, R. U. (2021). The impact of heuristic availability bias on investment decision-making: Moderated mediation model. *Business Strategy & Development*, 4(3), 246–257.
 36. Seo, M. G., Goldfarb, B., & Barrett, L. F. (2010). Affect and the framing effect within individuals over time: Risk taking in a dynamic investment simulation. *Academy of Management Journal*, 53(2), 411–431.
 37. Shalika, I., & Buddhika, H. J. R. (2025). Mental accounting, framing, and loss aversion impact on investment decisions of individual investors in the Colombo Stock Exchange. *International Journal of Accounting and Business Finance*, 11(1).
 38. Shefrin, H., & Statman, M. (2000). Behavioral portfolio theory. *Journal of Financial and Quantitative Analysis*, 35(2), 127–151.
 39. Shiller, R. J. (2000). *Irrational exuberance*. Princeton University Press.
 40. Simon, H. A. (1990). Bounded rationality. In J. Eatwell, M. Milgate, & P. Newman (Eds.), *Utility and probability* (pp. 15–18). Palgrave Macmillan.
 41. Sinha, A., & Shunmugasundaram, V. (2023). Relationship between demographic factors and behavioral biases. *Global Journal of Accounting & Finance*, 7(1).
 42. Stark, E., Baldwin, A. S., Hertel, A. W., & Rothman, A. (2017). Understanding the framing effect: Do affective responses to decision options mediate the influence of frame on choice?
 43. Sudirman, W. F. R., Winario, M., Priyatno, A. M., & Assyifa, Z. (2023). Risk tolerance: Heuristic bias towards investment decision making. *Jurnal Manajemen Teori dan Terapan*, 16(2).
 44. Taylor, O., Rossi, M., Lee, J., & Hernandez, M. (2024). Behavioral economics in consumer decision-making: Analyzing the impact of cognitive biases. *International Journal of Management, Business, and Economics*, 1(1).
 45. Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, 12(3), 183–206.
 46. Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5(2), 207–232.
 47. Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124–1131.
 48. Tversky, A., & Kahneman, D. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–291.
 49. Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453–458.
 50. Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453–458

51. Utari, A. D., Hariyanto, D., & Safitri, H. (2025). The influence of financial literacy, financial behavior, self-efficacy, and availability bias on stock investment decisions of Gen Z in Pontianak City. *Journal of Asian Multicultural Research for Economy and Management Study*, 6(1), 26–33.
52. Wang, B. (2023). The impact of anchoring bias on financial decision-making: Exploring cognitive biases in decision-making processes. *Studies in Psychological Science*, 1(2), 41–50. <https://doi.org/10.56397/SPS.2023.09.04>
53. Wikartika, I., Evanthi, A., & Suwaidi, R. A. (2023). Investment decision making with investment satisfaction as an intervening variable: Availability bias and financial literacy. *JBMP (Jurnal Bisnis, Manajemen Dan Perbankan)*, 9(1), 12–24.
54. Wu, C. H., Wu, C. S., & Liu, V. W. (2009). The conservatism bias in an emerging stock market: Evidence from Taiwan. *Pacific-Basin Finance Journal*, 17(4), 494–505.
55. Xie, J., Fang, Y., Gao, B., & Tan, C. (2023). Availability heuristic and expected returns. *Finance Research Letters*, 51, 103443