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Investor Behaviour and Risk Perception Through a Neurofinance Lens: An Empirical Study of Financial Decision-Making

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Abstract

Traditional theories of finance largely assume that investors behave rationally and make decisions based on complete and accurate information. However, real-world financial markets frequently reveal patterns of behaviour that deviate from these assumptions. Individual investors often rely on emotions, subjective judgement, and psychological tendencies while making investment decisions, particularly under conditions of uncertainty. In this context, the present study examines investor behaviour and risk perception through a neurofinance perspective, focusing on the combined influence of cognitive and emotional factors on financial decision-making. The results suggest that investment behaviour cannot be fully explained by rational financial models alone. Instead, financial decision-making reflects a complex interaction between rational evaluation and emotional responses. By adopting a neurofinance framework, the study provides deeper insights into the psychological mechanisms underlying investor behaviour. The findings offer practical implications for investors, financial advisors, and policymakers by highlighting the importance of incorporating behavioural and emotional considerations into investment strategies and financial decision-making processes. The findings reveal that investors exhibit varying levels of risk perception, which are significantly shaped by behavioural biases such as loss aversion, overconfidence, and herd behaviour. Emotional and cognitive factors are found to play a crucial role in influencing investment decisions, even among investors with adequate financial knowledge. The study is empirical in nature and is based on primary data collected from 184 individual investors using a structured questionnaire. Descriptive statistics, reliability analysis and Pearson's correlation analysis were employed to summarize the data, assess measurement reliability, examine the relationships among the study variables, and test the proposed hypotheses.

Keywords: Investor Behaviour; Risk Perception; Neurofinance; Behavioural Biases; Financial Decision-Making

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1. Introduction

Investment decisions in financial markets are often assumed to be the outcome of careful analysis and logical evaluation of risk and return. Classical and modern financial theories largely portray investors as rational agents who systematically process available information to maximise expected utility. However, real-world market behaviour frequently challenges this assumption. Episodes of excessive speculation, sudden market downturns, irrational trading patterns, and suboptimal portfolio choices indicate that investment decisions are not always driven by objective reasoning alone. Instead, investors are influenced by a combination of psychological tendencies, personal experiences, and emotional reactions, particularly during periods of uncertainty and heightened market volatility. These behavioural influences play a significant role in shaping how investors perceive risk and respond to changing market conditions.

In response to these observed deviations, behavioural finance emerged as an important field of study that incorporates psychological insights into financial decision-making. Behavioural finance highlights the role of cognitive limitations and emotional influences in shaping investor behaviour. Prior research has documented the widespread presence of behavioural biases such as overconfidence, herd behaviour, loss aversion, and anchoring, all of which affect how investors perceive risk and evaluate investment opportunities. These biases often result in decisions that deviate from predictions made by traditional rational models. While behavioural finance has significantly improved the understanding of investor behaviour, much of the existing research relies on psychological explanations and self-reported behavioural data. To gain a more comprehensive understanding of financial decision-making, researchers have increasingly turned towards neurofinance, an interdisciplinary field that integrates finance, psychology, and neuroscience. Neurofinance seeks to explain financial behaviour by examining how the brain processes information related to risk, reward, uncertainty, and loss.

From a neurofinance perspective, investment decisions are not solely the outcome of logical reasoning but are also shaped by emotional and neurological responses. Brain mechanisms associated with fear, anticipation of rewards, and sensitivity to losses play a critical role in influencing risk-taking behaviour. Emotional states such as anxiety, excitement, and regret can alter investors' perception of risk and may lead to decisions that contradict rational expectations, even when adequate financial knowledge is present.

The relevance of behavioural finance and neurofinance has become particularly pronounced in the Indian context. Rapid growth in retail investor participation, increased access to online trading platforms, widespread use of social media, and the availability of real-time financial information have transformed the investment landscape. While these developments have enhanced market accessibility, they have also intensified exposure to emotionally driven decision-making and behavioural biases among individual investors. Given this evolving environment, understanding how Indian investors perceive financial risk and how cognitive and emotional factors influence their investment decisions has become increasingly important. Despite growing interest in behavioural explanations, empirical studies that integrate behavioural finance concepts with a neurofinance perspective—particularly using primary data from Indian retail investors—remain limited.

Previous studies have established that behavioural biases significantly influence investment decisions (Kahneman & Tversky, 1979), while financial literacy contributes to more informed financial behaviour (Lusardi & Mitchell, 2014). Furthermore, neurofinance research has demonstrated the importance of cognitive and emotional processes in financial decision-making (Lo & Repin, 2002; Lo, 2017). However, limited empirical studies have integrated these perspectives using primary data from Indian retail investors. Therefore, the present study addresses this gap by examining investor behaviour and risk perception through a neurofinance framework. Against this backdrop, the present study examines investor behaviour and risk perception through a neurofinance lens by analysing primary survey data collected from individual investors. By integrating behavioural biases, emotional intelligence, and risk perception within a unified framework, the study aims to provide deeper insights into the psychological and cognitive processes underlying real-world investment decision-making.

2. Review of Literature

Traditional financial theories have long been built on the assumption that investors are rational, well-informed, and consistent in their decision-making. However, empirical observations from real financial markets frequently contradict this assumption. One of the earliest and most influential challenges to rational choice theory was presented by Kahneman and Tversky (1979) through prospect theory. Their work demonstrated that individuals evaluate gains and losses asymmetrically and tend to exhibit stronger emotional reactions to losses than to equivalent gains.

This insight helped explain why investors often make decisions that deviate from expected utility maximisation.

Subsequent research expanded upon these psychological foundations to explain broader market behaviour. Barberis, Shleifer, and Vishny (1998) argued that investor sentiment and cognitive errors can systematically influence asset prices, leading to market anomalies that cannot be explained by traditional efficiency-based models alone. Similarly, Thaler (1999) introduced the concept of mental accounting, highlighting how investors categorise financial outcomes into separate mental compartments. Such mental segregation often results in inconsistent decision-making, particularly when investors evaluate risks and returns in isolation rather than from a holistic portfolio perspective. Risk perception has been recognised as a critical behavioural element in investment decision-making. Rather than being determined solely by objective probabilities, risk is often shaped by subjective judgement and emotional responses. Slovic (1987) emphasised that individuals rely on intuitive and affective reactions while assessing risk, especially under uncertainty. Supporting this view, Weber and Milliman (1997) found that personal attitudes towards risk significantly influence financial choices, suggesting that perceived risk often differs from actual market risk.

The role of emotions in decision-making has gained increasing importance in behavioural research. Goleman (1995) highlighted that emotional awareness and regulation are essential for sound judgement, particularly in complex and uncertain environments. Extending this idea, Salovey and Mayer (1990) conceptualised emotional intelligence as the ability to recognise, understand, and manage one's own emotions as well as those of others. In the context of financial markets, where volatility and uncertainty are frequent, emotional intelligence can influence how investors respond to market fluctuations and stress. While behavioural finance focuses primarily on observable behaviour and psychological explanations, the emerging field of neurofinance offers deeper insights by examining the biological processes underlying financial decision-making. Lo and Repin (2002) demonstrated that physiological and emotional responses occur simultaneously with financial risk-taking, indicating that emotions are directly involved in trading decisions rather than being secondary influences. Further advancing this perspective, Lo (2017) proposed the adaptive markets hypothesis, which suggests that investor behaviour evolves over time as individuals adapt to changing market conditions through a combination of emotional, cognitive, and environmental factors.

Another important dimension influencing investor behaviour is financial literacy. Lusardi and Mitchell (2014) found that individuals with higher financial knowledge tend to make more informed financial decisions and are better equipped to manage risk. However, existing research also indicates that financial literacy alone does not eliminate behavioural biases. Even well-informed investors may exhibit emotionally driven behaviour during periods of market stress, highlighting the limitations of knowledge-based explanations. Empirical studies in behavioural finance commonly employ quantitative methods to ensure measurement reliability and validity. The internal consistency of behavioural constructs is often assessed using Cronbach's Alpha (Cronbach, 1951), while statistical software such as SPSS is widely used for descriptive and inferential analysis (Field, 2018; Hair et al., 2019). These methodological approaches provide a reliable foundation for examining complex behavioural relationships.

Overall, the reviewed literature suggests that investment decision-making is shaped by an interaction of behavioural biases, emotional intelligence, financial literacy, and subjective risk perception. While behavioural finance explains what biases exist, neurofinance contributes by explaining why such biases persist at a cognitive and emotional level. This integrated understanding provides a strong foundation for examining investor behaviour through a neurofinance lens, particularly in emerging markets such as India.

3. Objectives of the Study

1. To examine the behavioural characteristics exhibited by individual investors in the financial market.
2. To analyse how investors perceive financial risk while making investment decisions.
3. To identify the extent to which behavioural biases influence individual investment decisions.
4. To examine investor behaviour and risk perception through a neurofinance perspective by jointly analysing cognitive and emotional influences.
5. To derive practical implications that may assist in improving the quality of investment decision-making.

4. Hypotheses of the Study

In line with the objectives of the study and insights drawn from the review of literature, the following hypotheses have been formulated to empirically investigate investor behaviour and risk perception from a neurofinance perspective. These hypotheses aim to examine the relationships among behavioural biases, risk perception, and investment decision-making.

H₀₁: There is no statistically significant relationship between behavioural biases and investment decision-making.

H₁₁: There is a statistically significant relationship between behavioural biases and investment decision-making.

H₀₂: Risk perception does not have a statistically significant influence on investment decision-making.

H₁₂: Risk perception has a statistically significant influence on investment decision-making.

H₀₃: Cognitive and emotional factors do not significantly affect investors' perception of financial risk.

H₁₃: Cognitive and emotional factors significantly affect investors' perception of financial risk.

H₀₄: Behavioural biases and risk perception are independent of each other.

H₁₄: Behavioural biases and risk perception are significantly related to each other.

5. Data and Methodology

This section outlines the methodological framework adopted to examine investor behaviour and risk perception from a neurofinance perspective. The research design, data sources, sampling approach, data collection instrument, and statistical techniques are explained to ensure clarity and transparency in the research process. The study adopts a descriptive and analytical research design. It is empirical in nature and relies on primary data collected from individual investors. The descriptive approach helps in understanding behavioural characteristics and patterns of risk perception, while analytical techniques are applied to examine the relationships among behavioural biases, emotional factors, and investment decision-making.

Primary data form the core of the study and were collected directly from individual investors using a structured questionnaire. The questionnaire was designed to capture demographic details, behavioural tendencies, emotional aspects, and perceptions related to financial risk.

Secondary data were also consulted to support the theoretical framework and literature review, including academic journals, books, and published research studies. The sample consists of 184 individual investors. A convenience sampling technique was adopted due to accessibility and the willingness of respondents to participate in the survey. The selected sample size is considered adequate for applying statistical analysis and drawing meaningful behavioural insights within the scope of the study. Data were collected using a structured questionnaire divided into multiple sections. These sections included demographic information, statements related to behavioural biases influencing investment decisions, and items measuring investors' perception of financial risk. Responses were recorded on a five-point Likert scale ranging from Strongly Disagree to Strongly Agree. The reliability and internal consistency of the measurement scales were assessed using Cronbach's Alpha. A coefficient value above 0.70 was considered indicative of acceptable reliability.

The collected data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarise the demographic characteristics and key study variables, while Cronbach's Alpha was employed to assess the internal consistency and reliability of the measurement scales. Pearson's correlation analysis was performed to examine the relationships among behavioural biases, risk perception, emotional intelligence, financial literacy, and investment decision-making. Furthermore, the proposed hypotheses were tested using Pearson's correlation coefficients at the 5% and 1% levels of significance. The findings were interpreted in accordance with the objectives of the study.

6. Results

6.1 Demographic Profile of Respondents

The demographic profile shows that most respondents are from the economically active age group and possess postgraduate-level education. More than half of the investors have limited experience.

Table 1 Demographic Profile of Respondents

VARIABLE	CATEGORY	PERCENTAGE (%)
Age (29–44 years)	Yes	90.22
	No	9.78
Gender	Male	57.07
	Female	42.93
Education	Post Graduate	50.54
	Graduate	37.50
	Doctorate	10.87
Investment Experience	0–2 years	52.72
	2–4 years	20.65
	4–6 years	13.59
	6+ years	13.04

Source: Authors' Compilation

6.2 Reliability Analysis

The results indicate that all constructs used in the study have Cronbach's Alpha values exceeding the minimum acceptable limit of 0.70. This confirms that the questionnaire items are internally consistent and reliable. Therefore, the data collected from 184 respondents are suitable for descriptive, correlation, and hypothesis testing analyses.

Table 2 Reliability Statistics

Construct	Number of Items	Cronbach's Alpha
Emotional Intelligence	10	0.81
Financial Literacy	8	0.78
Risk Perception	6	0.84
Behavioural Biases	12	0.86
Investment Decision-Making	6	0.79

Source: Authors' Compilation

6.3 Emotional Intelligence of Investors

The combined results show that investors possess a moderate level of emotional intelligence. Emotional awareness has the highest mean value, indicating that most investors are aware of their emotions while making investment decisions. Emotional regulation also records a relatively higher mean, suggesting that investors are able to control their emotions to some extent during market fluctuations. However, the lower mean score for impulsiveness (reverse) highlights the presence of impulsive behaviour, especially during periods of market volatility. Overall, the findings suggest

that although investors are generally aware of their emotions, their ability to regulate these emotions during financial decision-making is comparatively weaker. This imbalance may increase the likelihood of impulsive investment decisions, particularly in uncertain and volatile market conditions.

Table 3 Emotional Intelligence of Investors

Dimension	Mean	Std. Deviation
Emotional Awareness	3.42	1.11
Emotional Regulation	3.35	1.08
Impulsiveness (Reverse)	3.18	1.14

Source: Authors' Compilation

The findings suggest that while investors possess reasonable emotional awareness and control, emotional impulses still influence decision-making, supporting the neurofinance view that emotions play a critical role in financial behaviour.

6.4 Financial Literacy of Investors

The results show that respondents have a moderate level of financial literacy. Understanding of the risk–return relationship records the highest mean value, indicating basic financial awareness among investors. Knowledge related to diversification and cost–tax considerations is slightly lower, suggesting gaps in comprehensive financial planning.

Table 4 Financial Literacy of Investors

Aspect	Mean	Std. Deviation
Risk–Return Understanding	3.51	1.06
Diversification Knowledge	3.44	1.02
Cost & Tax Awareness	3.37	1.09

Source: Authors' Compilation

Although financial literacy contributes positively to informed decision-making, the findings indicate that knowledge alone does not eliminate behavioural biases. Emotional and cognitive factors continue to influence investment choices even among financially aware investors. The findings indicate that financial literacy among investors is adequate but not strong enough to completely offset emotional and behavioural influences on investment decisions.

6.5 Risk Perception of Investors

Loss sensitivity records the highest mean score, indicating that investors are highly cautious after experiencing financial losses. Speculative investments such as short-term trading and cryptocurrency are perceived as highly risky, while general market risk is viewed with moderate concern. These findings indicate that investors' perception of financial risk is not purely objective but is significantly shaped by prior experiences and emotional responses.

Table 5 Risk Perception of Investors

Risk Dimension	Mean	Std. Deviation
Market Risk	3.49	1.21
Loss Sensitivity	3.77	1.19
Speculative Risk	3.56	1.23

Source: Authors' Compilation

The observed variation in risk perception suggests that investors tend to overestimate or underestimate risk based on behavioural tendencies rather than fundamental market information alone. The analysis confirms strong loss-averse behaviour among investors, highlighting that past losses significantly shape risk perception and future investment decisions.

6.6 Behavioural Biases among Investors

The composite analysis reveals the presence of multiple behavioural biases among investors. Loss aversion records the highest mean value, followed by overconfidence and anchoring bias. Herd behaviour, although present, shows comparatively lower intensity. The dominance of biases such as loss aversion and overconfidence reflects investors' tendency to react asymmetrically to gains and losses. This behavioural pattern implies that emotional responses often override rational evaluation, leading to systematic deviations from optimal investment decisions.

Table 6 Behavioural Bias Statistics

Bias	Mean	Std. Deviation
Overconfidence	3.29	1.18
Herd Behaviour	3.11	1.21
Anchoring Bias	3.27	1.17
Loss Aversion	3.38	1.19

Source: Authors' Compilation

The findings indicate that investors are more influenced by fear of losses and self-confidence than by social imitation, reinforcing behavioural finance and neurofinance explanations of biased decision-making.

6.7 Investment Outcome Behaviour

The results show moderate satisfaction with investment returns among respondents. Regular review behaviour scores the highest mean, indicating increasing investor involvement in monitoring investments. Portfolio discipline reflects moderate consistency. These results further indicate that investors who regularly monitor their investments tend to develop greater portfolio discipline, which contributes to relatively stable return satisfaction levels. Emotional reactions to returns appear to influence subsequent investment decisions, reinforcing the role of behavioural and emotional factors in shaping investment outcomes.

Table 7 Investment Outcome Behaviour Statistics

Outcome Aspect	Mean	Std. Deviation
Return Satisfaction	3.26	1.15
Portfolio Discipline	3.34	1.09
Review Behaviour	3.41	1.07

Source: Authors' Compilation

The findings suggest that while investors actively monitor their investments, emotional reactions to returns influence satisfaction levels and subsequent decision-making. The analysis states that emotional intelligence, financial literacy, risk perception, behavioural biases, and investment outcomes are interlinked. Emotional and cognitive factors jointly influence how investors perceive risk and make financial decisions, validating the neurofinance framework adopted in this study.

6.8 Correlation Analysis

The significant correlations observed among behavioural biases, risk perception, and investment decision-making confirm the interdependent nature of these variables. This relationship supports the relevance of a neurofinance framework, which recognizes the combined influence of cognitive and emotional processes on financial behaviour.

Table 8 Pearson's Correlation

Variables	EI	FL	RP	BB
EI	1	0.42**	-0.38**	-0.46**
FL	0.42**	1	-0.29*	-0.41**
RP	-0.38**	-0.29*	1	0.59**
BB	-0.46**	-0.41**	0.59**	1

* p < 0.05, ** p < 0.01

Source: Authors' Compilation

6.9 Hypothesis Testing

The hypotheses were tested using Pearson's Correlation Coefficient on composite scores derived from the responses of 184 investors. The level of significance was considered at 5 percent and 1 percent. Pearson's correlation analysis was applied to assess the strength and direction of relationships among behavioural biases, emotional intelligence, risk perception, and investment decision-making. This technique is appropriate for examining linear associations between continuous variables.

Table 9 Hypothesis Testing Results

Hypothesis	Variables Tested	Statistical Tool	Result	Decision
H01 vs H11	Behavioural Biases × Investment Decision-Making	Pearson Correlation	$r = 0.47^{**}, p < 0.01$	H01 Rejected, H11 Accepted
H02 vs H12	Risk Perception × Investment Decision-Making	Pearson Correlation	$r = 0.52^{**}, p < 0.01$	H02 Rejected, H12 Accepted
H03 vs H13	Emotional Intelligence × Risk Perception	Pearson Correlation	$r = -0.38^{**}, p < 0.01$	H03 Rejected, H13 Accepted
H04 vs H14	Behavioural Biases × Risk Perception	Pearson Correlation	$r = 0.59^{**}, p < 0.01$	H04 Rejected, H14 Accepted

* p < 0.05, ** p < 0.01

Source: Authors' Compilation

The results indicate a statistically significant relationship between behavioural biases and investment decision-making, suggesting that investors' decisions are influenced by psychological tendencies. Risk perception is also found to have a significant impact on investment decision-making, highlighting the role of subjective risk evaluation. Further, emotional intelligence shows a significant association with risk perception, indicating that cognitive and emotional factors influence how investors assess financial risk. The strong relationship observed between

behavioural biases and risk perception suggests that biased thinking patterns shape investors' understanding of risk. Overall, the findings provide empirical support for the neurofinance framework adopted in the study.

7. Findings of the Study

The analysis indicates that investors demonstrate a moderate level of emotional intelligence, with emotional awareness being relatively stronger than emotional regulation abilities.

- Financial literacy among investors is found to be satisfactory; however, it is not sufficient to completely mitigate the influence of behavioural biases on investment decisions.
- Sensitivity to potential losses plays a significant role in shaping investors' perception of financial risk.
- Behavioural biases such as loss aversion and overconfidence are widely observed among individual investors.
- Investment outcomes reflect a moderate level of satisfaction, which appears to be influenced by investors' emotional responses to investment returns.
- Overall, investor behaviour is influenced by an interaction of cognitive, emotional, and behavioural factors rather than purely rational considerations.

8. Conclusion

The findings of this study confirm that investor behaviour and risk perception cannot be fully explained by traditional rational finance theories alone. By adopting a neurofinance perspective, the study demonstrates that financial decision-making is influenced by a complex interaction between cognitive evaluation and emotional responses. Investors do not rely solely on objective information; instead, their decisions are shaped by psychological tendencies, emotional awareness, and subjective interpretation of risk. This perspective provides a more realistic understanding of how investment decisions are formed in real market conditions. The analysis reveals that behavioural biases such as loss aversion, overconfidence, anchoring, and herd behaviour are widely present among individual investors. Among these, loss aversion emerges as a dominant factor influencing risk perception and investment behaviour. Investors tend to react more strongly to potential losses than to equivalent gains, which affects their willingness to take risk and shapes

future investment choices. These behavioural patterns indicate that emotional responses often override rational evaluation, particularly during periods of market uncertainty and volatility.

The study also highlights the role of emotional intelligence in financial decision-making. While investors exhibit a reasonable level of emotional awareness, limitations in emotional regulation may lead to impulsive reactions under stressful market conditions. Emotional responses such as fear, anxiety, and excitement significantly influence how investors perceive financial risk and respond to market fluctuations. This finding supports the neurofinance view that emotions are not external disturbances but integral components of the decision-making process.

Although financial literacy contributes positively to investors' understanding of risk–return relationships and diversification, the results suggest that knowledge alone is not sufficient to eliminate behavioural biases. Even financially informed investors are susceptible to emotionally driven decisions when faced with uncertainty or adverse market movements. This indicates that effective investment decision-making requires not only technical financial knowledge but also an awareness of behavioural and emotional influences.

Overall, the study provides empirical support for integrating behavioural finance concepts with a neurofinance framework, particularly in the context of Indian retail investors. The findings offer important implications for investors, financial advisors, and policymakers by emphasising the need to incorporate psychological and emotional dimensions into investment strategies and investor education programmes. By recognising the cognitive and emotional foundations of financial behaviour, more informed and balanced investment decisions can be encouraged.

9. Limitations and Future Scope

9.1 Limitations

The study is based on self-reported primary data collected through a survey, which may be subject to response bias. The adoption of a convenience sampling technique restricts the generalisability of the findings beyond the sampled population. Moreover, the study relies on perceptual and behavioural measures rather than experimental or neuroscientific methods commonly used in advanced neurofinance research. Additionally, the cross-sectional nature of the data limits the ability to capture dynamic changes in investor behaviour over different market conditions.

9.2 Future Scope

Future studies may extend the scope of research by employing longitudinal data to capture changes in investor behaviour over time and across varying market cycles. The use of experimental neurofinance techniques and neuroimaging tools may provide deeper insights into the neurological and emotional mechanisms underlying financial decision-making. Further research may also integrate advanced analytical models or machine learning techniques to better predict behavioural patterns and risk perception among investors. Additionally, comparative studies across different regions, demographic groups, and investment categories could further enrich the understanding of investor behaviour.

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