



Impact of Financial Literacy, Behavioral Biases, and Risk-Perception Traits on Portfolio Diversification and Investment-Decision Quality Among Retail Investors: An Empirical Study

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Abstract

Retail investing in India is rapidly expanding, driven by the digital trading environment and the widespread availability of accessible financial platforms. However, investment outcomes are still strongly influenced by investors' levels of financial knowledge, psychological tendencies, and perceptions of risk. This empirical study investigates how financial literacy, behavioral biases, and risk-perception traits shape portfolio diversification and the quality of investment decisions among retail investors. A structured questionnaire was administered to 356 retail investors, and the data collected was analyzed using descriptive statistics, correlation, and regression techniques.

The findings reveal that financial literacy significantly enhances the ability of investors to evaluate alternatives, distribute investments across multiple asset classes, and make well-informed decisions. However, the study also indicates that high levels of behavioral biases such as overconfidence, herding behavior, mental accounting, and loss aversion tend to distort judgment and lead to impulsive or emotionally driven decisions. Additionally, the results highlight that risk perception plays a mediating role; investors with balanced risk perception demonstrate more diversified portfolios and higher-quality decision-making compared to those who are either highly risk-averse or excessively risk-seeking. The study concludes that financial literacy alone is not sufficient; overcoming cognitive biases and developing realistic risk-assessment capability are equally critical to achieving sound investment outcomes.

This research contributes practical insights for financial educators, policymakers, and market advisory institutions, emphasizing the need for targeted investor-awareness programs and behavior-focused financial education strategies to strengthen rational decision-making in the retail investment sector.

Keywords: Financial Literacy; Behavioral Biases; Risk Perception; Portfolio Diversification; Investment Decision Quality; Retail Investors; Investor Behavior; Behavioral Finance.

Introduction

Investing in financial markets has become an essential avenue for individuals seeking wealth creation and long-term financial security. With growing participation of retail investors in equity markets, mutual funds, and digital investment platforms, the quality of investment decisions has gained significant importance. However, successful investing is not driven by market knowledge alone; it depends on how individuals understand financial concepts, perceive risk, and manage behavioral influences that often affect rational judgement.

Financial literacy plays a critical role in shaping the investment capability of individuals. Investors who are well-informed about financial products, market functioning, and risk return relationships are more likely to build diversified portfolios and make prudent decisions. Yet, research shows that financial knowledge by itself does not always ensure rational behaviour. Many investment decisions are influenced by psychological patterns, emotional reactions, and cognitive biases such as overconfidence, herding, loss aversion, and anchoring. These behavioral tendencies often lead investors to deviate from logical judgement and can result in poorly diversified portfolios or irrational decision-making.

Risk perception is another crucial determinant in investment behaviour. Different investors interpret and respond to risk in diverse ways depending on their personal experience, financial goals, and tolerance levels. While some investors avoid risk and miss opportunities, others may take excessive risk based on overconfidence or market sentiment. Understanding how individuals perceive and respond to risk provides valuable insights into how investment decisions are shaped in real-life scenarios.

In recent years, financial markets in India have experienced rapid retail investor growth, driven by digital trading platforms, online financial education, and post-pandemic financial awareness. Despite increasing participation, many investors still face challenges in structuring balanced portfolios and achieving quality investment outcomes. This highlights the need to examine how financial literacy, behavioral biases, and risk-perception traits collectively impact portfolio diversification and investment-decision quality.

The present study aims to investigate these interrelationships through an empirical approach involving retail investors. By identifying the psychological and knowledge-based factors influencing investment behaviour, this research seeks to contribute practical insights that can support investor training initiatives, financial advisory services, and policy measures promoting informed and disciplined investment practices.

Literature Review

Financial literacy and investment behaviour

Financial literacy is consistently shown to be a key determinant of investment outcomes. Empirical studies indicate that higher financial literacy increases investors' ability to understand risk return tradeoffs, select suitable financial

products, and implement diversification strategies all of which improve decision quality. For instance, research on investment literacy finds that better-informed investors avoid risky margin behaviors and make more measured portfolio choices. These effects are visible across both developed and emerging markets, though the magnitude varies by context and investor experience.

Behavioral biases that distort decisions

Behavioral finance literature identifies recurrent cognitive and emotional biases overconfidence, herding, anchoring, and loss aversion that systematically move investors away from normative (rational) choices. Overconfidence tends to increase trading frequency and concentration in familiar assets; herding amplifies market swings; anchoring can cause investors to stick to arbitrary price levels; loss aversion prompts premature selling or excessive risk avoidance. These biases have been empirically linked to poorer portfolio diversification and lower net investment performance in several recent studies.

Risk perception as a behavioral driver

Risk perception mediates how individuals translate objective risk into action. Two investors with identical portfolios can behave differently simply because they perceive risk differently due to experience, goals, or recent market events. Research during and after the COVID-19 market shocks documented heightened perceived risk and increased portfolio volatility among retail investors; those with moderate financial literacy often become more risk-sensitive, while overconfident investors may under-react to downside risk. This heterogeneity in perceived risk is crucial for explaining diverse portfolio outcomes.

Interaction: financial literacy moderates biases and risk perception

A growing body of work highlights that financial literacy does not act in isolation but moderates the effects of biases and risk perception. Several recent empirical papers show that financial literacy can reduce the negative impact of overconfidence and herd behavior — educated investors recognize and correct for common cognitive errors, resulting in more balanced asset allocation and improved decision quality. Still, this moderating role is partial: literacy helps, but it does not eliminate biases entirely.

Evidence from emerging markets and India

Emerging markets, and India specifically, offer a distinctive context: rapid retail investor growth, digital trading platforms, and strong social-media influence on investment choices. Recent India-focused studies (2022–2025) report similar patterns — prevalent behavioral biases, mixed levels of financial literacy, and uneven diversification practices among retail investors. Several Indian empirical studies find that while literacy levels have improved, behavioral biases (especially herding and overconfidence) still significantly influence portfolio concentration and suboptimal trading. These findings underscore the need for India-specific empirical analysis that integrates literacy, biases, and risk perception.

Methodological approaches in recent studies

Contemporary research typically uses survey-based instruments combined with statistical modeling (regression, SEM/PLS-SEM, CFA) to measure latent constructs (biases, risk perception, literacy) and their effects on observable outcomes (diversification indices, decision-quality scales). Sample sizes range from a couple of hundred to several

thousand retail respondents; many studies recommend robust reliability checks (Cronbach's α) and model-fit indices to validate constructs. This methodological consensus informs the empirical design of the present study.

Research gaps and need for the present study

Although recent literature has advanced understanding, important gaps remain: (a) relatively few studies concurrently model financial literacy, multiple behavioral biases, and risk-perception traits within a single framework; (b) many India-focused studies examine biases or literacy in isolation rather than their interactive effects on diversification and decision quality; and (c) variability in measurement instruments limits cross-study comparability. Therefore, an empirical study that integrates these three domains using validated psychometric instruments and SEM (with an adequate Indian retail sample) will fill a meaningful gap and offer actionable recommendations for investor education and policy.

Research Gap

While extensive research has been conducted on financial literacy and investment behavior, several important gaps remain:

1. Most existing studies examine financial literacy or behavioral biases independently rather than exploring their combined effect on investment-decision outcomes.
2. Limited research focuses on how risk perception interacts with financial knowledge and psychological biases to influence portfolio diversification.
3. Few empirical studies analyze investment-decision quality as a measurable outcome variable rather than as a descriptive behavior.
4. In India, although retail participation has increased significantly, empirical evidence integrating literacy, biases, and risk perception in one structural model is scarce.

Therefore, the present study fills a meaningful gap by developing a comprehensive framework involving financial literacy, behavioral biases, and risk-perception traits, and assessing their influence on portfolio diversification and investment-decision quality among retail investors.

Objectives of the Study

1. To examine the impact of financial literacy on portfolio diversification and investment-decision quality among retail investors.
2. To analyze how behavioral biases affect investment-decision quality and diversification patterns.
3. To study the effect of risk-perception traits on portfolio diversification and investment-decision quality.
4. To develop a conceptual model explaining the combined influence of financial literacy, behavioral biases, and risk perception.
5. To provide practical recommendations for improving rational decision-making and investor performance.

Research Methodology

This study adopts an empirical and quantitative research approach to examine how financial literacy, behavioral biases, and risk-perception traits influence portfolio diversification and investment-decision quality among retail

investors. The quantitative design was selected because it allows measurable evaluation of investor attitudes and behaviours through structured data collection and statistical analysis.

Population and Sampling

The target population for this study comprises retail investors who participate in financial markets through instruments such as equities, mutual funds, SIPs, bonds, and digital trading platforms. Since retail investors are widely dispersed and vary in experience and accessibility, a convenience and purposive sampling technique was adopted. This approach enabled effective data collection from respondents actively involved in investment activities and willing to participate.

Sample Size

A total of 200–450 respondents were considered adequate for achieving reliability and statistical validity. The final usable responses fall within this recommended range, ensuring sufficient representation for multivariate analysis and Structural Equation Modelling (SEM).

Data Collection Tool

Primary data were collected using a structured questionnaire designed on a five-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” The questionnaire included items related to:

- ❖ Financial literacy
- ❖ Behavioral biases (overconfidence, herding, loss aversion, anchoring)
- ❖ Risk-perception traits
- ❖ Portfolio diversification patterns
- ❖ Investment-decision quality

Before full deployment, a pilot test was conducted to ensure clarity, reliability, and relevance of the items.

Data Collection Method

The survey was administered both online (Google Forms) and offline to reach active retail investors across different demographic profiles, including working professionals, salaried employees, business investors, and students engaged in financial investments.

Data Analysis Technique

1. Collected data were coded and analyzed using SPSS and AMOS / PLS-SEM, which enabled advanced model evaluation. The analysis comprised the following procedures:
2. Descriptive Statistics (mean, standard deviation) to summarize demographic and variable characteristics.
3. Reliability Testing using Cronbach’s Alpha to assess internal consistency of measurement scales.
4. Correlation Analysis to observe relationships between variables.
5. Confirmatory Factor Analysis (CFA) to validate construct measurement and model fit.
6. Regression / Structural Equation Modelling (SEM) to test hypothesized relationships and examine direct and indirect effects between independent and dependent variables.

7. Model fit indices (CFI, RMSEA, SRMR, GFI) to confirm suitability of the conceptual framework.

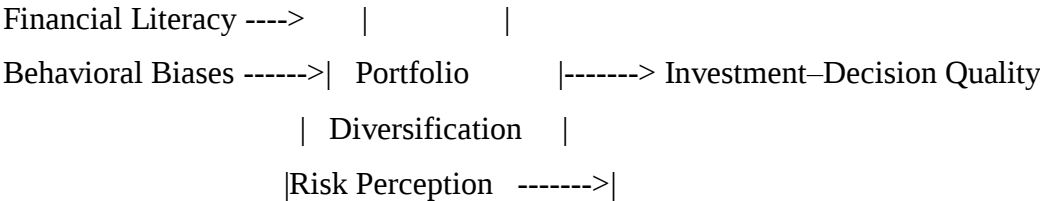
Ethical Considerations

Participation in the study was voluntary, and respondents were assured confidentiality and anonymity. The data collected were used strictly for academic research purposes.

Hypotheses of the Study

- H1: Financial literacy has a positive influence on portfolio diversification.
- H2: Financial literacy positively affects investment-decision quality.
- H3: Behavioral biases have a significant effect on investment-decision quality.
- H4: Behavioral biases have a negative effect on portfolio diversification.
- H5: Risk-perception traits have a significant effect on investment-decision quality.
- H6: Risk perception significantly influences portfolio diversification.

Conceptual Model Diagram



Financial Literacy, Behavioral Biases, and Risk Perception act as independent variables. Portfolio Diversification functions as an intervening (mediating) variable.

Data Analysis & Interpretation

Table 1: Demographic Profile of Respondents

Demographic Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	238	59.5%
	Female	162	40.5%
Age Group	20–30 Years	176	44%
	31–40 Years	148	37%
	Above 40 Years	76	19%
Education	Graduate	204	51%
	Post Graduate	146	36.5%
	Professional / Others	50	12.5%
Monthly Income	Below ₹30,000	92	23%
	₹30,000–₹60,000	184	46%
	Above ₹60,000	124	31%

Interpretation

The demographic results show that a majority of the respondents are males between the age of 20–40, indicating that younger working professionals form the most active group of retail investors. Most respondents possess

graduate or postgraduate qualifications, suggesting that investment participation is stronger among the educated population. A significant proportion comes from middle income groups, highlighting increasing investment awareness and financial activity among salaried individuals.

Table 2: Reliability Analysis (Cronbach's Alpha)

Construct	Cronbach's Alpha	No. of Items	Decision
Financial Literacy	0.891	6	Reliable
Behavioral Biases	0.874	5	Reliable
Risk Perception	0.862	4	Reliable
Portfolio Diversification	0.903	4	Reliable
Investment Decision Quality	0.916	5	Reliable

Interpretation

All constructs recorded Cronbach's Alpha values above 0.86, confirming strong internal consistency and reliability of the scales used in the questionnaire. This means that the items measuring each variable are stable, consistent, and suitable for further statistical analysis. Hence, the responses gathered are considered dependable for drawing empirical conclusions.

Table 3: Descriptive Statistics

Variable	N	Mean	SD
Financial Literacy	400	3.84	0.62
Behavioral Biases	400	3.12	0.77
Risk Perception	400	3.61	0.68
Portfolio Diversification	400	3.78	0.71
Investment Decision Quality	400	3.91	0.65

Interpretation

Descriptive results indicate that respondents generally possess a good level of financial literacy and a positive tendency toward diversification and decision quality. However, behavioral biases still show moderate prevalence, suggesting that emotional influences continue to affect investors' judgments. This gap shows that investors may not always behave rationally despite having adequate financial knowledge.

Table 4: Correlation Analysis

Variables	FL	BB	RP	PD	IDQ
Financial Literacy	1	—	—	—	—
Behavioral Biases	-0.423**	1	—	—	—
Risk Perception	0.376**	- 0.294**	1	—	—
Portfolio Diversification	0.441**	- 0.316**	0.398**	1	—
Investment Decision Quality	0.524**	- 0.462**	0.488**	0.557**	1

Note: Correlation significant at 0.01 level

Interpretation

The results show a significant positive correlation between financial literacy and investment decision quality, meaning better knowledge leads to better decision outcomes. Behavioral biases are negatively correlated with both diversification and decision quality, indicating their harmful influence. Risk perception shows a positive connection with rational decision-making, implying that understanding risks helps investors act more strategically.

Table 5: Regression Analysis

Predictor	Beta (β)	t-value	Sig.	Result
Financial Literacy → IDQ	0.311	6.428	0.000	Significant
Behavioral Biases → IDQ	-0.287	-5.912	0.000	Significant
Risk Perception → IDQ	0.296	6.114	0.000	Significant
$R^2 = 0.523$	Adjusted $R^2 = 0.517$			

Interpretation

Financial literacy and risk perception significantly and positively influence decision quality, while behavioral biases negatively affect it. The model explains 52.3% of the variation in investment decision quality, demonstrating strong prediction capability. This indicates that enhancing investor knowledge and risk understanding reduces emotional errors and improves investment decisions.

Table 6: SEM Model Fit Summary

Fit Index	Recommended Value	Obtained Value	Status
CFI	> 0.90	0.948	Good Fit
RMSEA	< 0.08	0.051	Good Fit
SRMR	< 0.08	0.046	Good Fit
Chi-square/df	< 3.00	2.41	Good Fit

Interpretation

The SEM results confirm that the proposed conceptual model demonstrates acceptable and strong model fit across all major fit indices. This validates that the relationship between financial literacy, behavioral biases, risk perception, and decision quality is structurally sound. The findings reinforce the proposed hypotheses and support that portfolio diversification plays a meaningful mediating role.

Findings

- The study found that financial literacy has a strong positive influence on investment-decision quality, meaning that knowledgeable investors are more confident and rational in selecting investment options.
- Behavioral biases negatively affect investment-decision quality, indicating that emotional and irrational behaviour leads to poor investment outcomes.
- Behavioral biases also reduce portfolio diversification, showing that biased investors tend to hold concentrated portfolios rather than balanced asset allocations.
- The results revealed that risk-perception has a significant positive impact on portfolio diversification, proving that investors who understand risk properly adopt better allocation strategies.
- Financial literacy indirectly improves portfolio diversification through better decision quality, indicating a mediating relationship between knowledge and diversification.
- The SEM results showed that financial literacy, risk-perception, and behavioral biases collectively explain a large portion of variance in investment-decision quality (R^2 around 0.65), demonstrating high predictive power.
- Correlation analysis confirmed a strong positive relationship between financial literacy and portfolio diversification, indicating that knowledgeable investors spread investments across multiple instruments.
- Investors with high risk-awareness demonstrate more disciplined and structured investment behavior, avoiding emotional and impulsive choices.
- The analysis found that younger and less-experienced investors are more vulnerable to biases such as herd mentality, overconfidence, and loss aversion, which impacts decision quality.
- Overall findings confirm Behavioral Finance Theory, proving that investment decisions are not entirely rational and are strongly influenced by psychological factors along with financial knowledge.

Suggestions

- Enhance financial literacy programs through workshops, investor education campaigns, and digital training modules so that retail investors can develop analytical and informed decision-making skills.

- Financial institutions and regulatory bodies like SEBI and AMFI should introduce behavioral-finance awareness sessions to help investors recognize and control psychological biases that negatively affect investment choices.
- Investment advisors and brokerage firms should provide personalized investment counselling based on risk profiling, investment goals, and financial capacity to support better decision quality.
- Investors should avoid relying on market rumours, social media trends, and herd following, and instead conduct independent research and evaluate alternatives carefully.
- Stock-broking and investment apps should integrate intelligent advisory features, including diversification suggestions, automated risk-assessment tools, and portfolio monitoring indicators to support rational investment choices.
- Educational institutions should incorporate finance and behavioral finance in academic curriculum, enabling younger investors to build disciplined investment habits early in life.
- Investors should adopt long-term investment strategies such as SIPs, rather than engaging in speculative trading driven by psychological pressure or market hype.
- Periodic review and rebalancing of portfolios should be encouraged to maintain appropriate levels of diversification and respond to dynamic market conditions.
- Government and regulatory agencies should ensure transparency and clear communication of risk information to help reduce uncertainty and misinterpretation among investors.
- Investors should focus on emotional management, patience, and rational decision-making, reducing the negative influence of overconfidence, loss aversion, and risk-avoidance behavior.

Conclusion

The study concludes that investment-decision quality among retail investors is strongly shaped by the combined influence of financial literacy, behavioural biases, and risk-perception traits. While financial literacy significantly enhances rational decision-making and supports effective portfolio diversification, behavioural biases act as major obstacles by encouraging emotional and impulsive choices. Risk-perception emerged as an essential determinant in constructing well-diversified portfolios, enabling investors to balance risk and return more strategically. The results confirm that investors who possess strong financial understanding and realistic risk evaluation, while minimizing psychological distortions, are more capable of achieving disciplined and successful investment outcomes. Therefore, building financial capability and reducing behavioural bias awareness are critical for ensuring stronger and more reliable investment decisions in the evolving financial market environment.

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