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Empirical Analysis of Cognitive Biases in Shaping Retail Investment Decisions Under the Moderation of Financial Literacy in the Indian Equity Market

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Abstract:

This study focuses on the effect of cognitive biases on retail investors' investment decision-making process in the Indian equity market and deliberates on understanding the role of financial literacy as a moderating effect. The hallmarks were investigated and six biases were studied: overconfidence, anchoring and adjustment, herding, disposition effect, risk aversion, and representativeness, on primary data sifted from 302 retail investors. In this research, a cross-sectional use research design, reliability analysis, Pearson correlation, moderation analysis, and multiple regression were applied in the analysis of the data. Both anchoring bias and herding bias were significantly affecting investment decision-making ($\beta = 0.274$, $p < 0.001$ and $\beta = 0.252$, $p < 0.001$, respectively) and the overconfidence bias was also found to have a positive direct effect on investment decision-making ($\beta = 0.138$, $p = 0.025$), while disposition bias, risk aversion, and representativeness bias were not having a significant direct effect. Overconfidence, herding effect, and anchoring effect have significant elements to financial literacy. The study finds that a retail investor's investment decision in the equity market is influenced by cognitive bias in the market and financial literacy plays a significant role in buffering the effect to a certain extent; this study also helps to explain the behavioral factor affecting decision making of retail investors in equity market in India.

Keywords: Cognitive Biases, Indian Equity Market, Investment Decisions, Financial Literacy

1. Introduction

Individual investment decisions are a key driver of household wealth building, resource allocation, and capital formation in an emerging market economy [1]. The basic structure of neoclassical finance based on expected utility theory [2] and the Efficient Market Hypothesis [3] is that financial markets are presumed to be informationally efficient, and the individuals who make up the market are represented as strictly rational, optimizing individuals who look at the choice from a risk/return perspective [2], [3]. This no-frills paradigm has an important characteristic: in the absence of friction, asset prices incorporate all public and private information and allocate capital in a way that is entirely immune to systematic emotional distortions [3], [4].

However, as new departures from normal market conditions occur with increasing frequency, asset speculation, and variability of markets from country to country, the realism of normative economic theory is challenged [4]-[6]. The behavioral finance paradigm shows that human decision-makers suffer from cognitive limitations, information processing problems, and emotional weaknesses [7]. Taking this critical step further, Prospect Theory shows that investors place their value judgements on financial options based on asymmetric value functions that place a premium on negative values rather than changes in terminal wealth values [8]. People heuristically use their cognitive processes when they encounter probabilistic situations, such as those in uncertain markets [9]. In addition to being useful thinking devices that save mental effort, heuristics used consistently lead to irrational market actions, biased judgements, and distorted expectations [9], [10].

Cognitive shortcuts have been shown to negatively affect the performance of retail portfolios in empirical studies in many developing capital markets [11]. Specifically, behavioral biases such as overconfidence, anchoring-and-adjustment, herd mentality, and representativeness can lead to investors holding their perception of risk to be inaccurate and to their asset allocation decision-making being distorted [11], [12]. Moreover, market participants seem to have the disposition effect; that is, they tend to sell appreciated stocks early and try to keep down the realized loss on sales of declining stocks, which is strongly influenced by past prices [14]. These affective biases,

together with psychological stress and emotional instability, aggravate trading decisions, which in turn facilitate the accumulation of such portfolio misfortunes as systemic underperformance [15].

In this behavioral environment, financial literacy is a key cognitive link. Financial literacy is thought of as the investor's ability to read financial tools, calculate real performance, and find structural risk-return trade-offs, and has constituted the analytical foundation for facing the emotional impulse of investors [12], [13]. Good financial knowledge supports investors in adopting objective valuation methods and obtaining special financial advisory procedures, reducing the cognitive biases affecting investment decisions [13]. On the other hand, financially unskilled players in the market are overexposed to this herd behavior, sentiment shock, and large drawdowns [1], [10].

The Indian equity market is particularly interesting because of its potential unique structural relationships. India has experienced unprecedented democratization of retail investment in recent years with the penetration of smartphones, zero-commission discount brokerages, and a broad online payment ecosystem across the country [11], [13]. Many participants in the retail market are directly participating in cash purchases and sales of equity and speculative derivative contracts with or without traditional institutional supervision and access to proper financial education [12], [13]. The retail volume increases, so the cognitive heuristic plays a strong role in determining the overall price discovery process and local trading volatility [1], [14].

While there has been an increased focus on the behavioral aspects of retail investment in emerging markets, certain studies on the joint effects of multidimensional cognitive biases, objective financial literacy, and retail investment behavior in India are still limited and partial [11], [12]. To address these lacunas in theory and empirical evidence, this study examines the empirical effect of the concept of cognitive biases on individual investors' investment decisions with financial literacy in the Indian stock market. It provides objective empirical findings that provide valuable guidance to regulators, financial technology providers, and financial advisors when designing incentives that encourage disciplined and resilient investor activity in capital markets, while examining the direct effect of core cognitive heuristics and testing whether financial knowledge has a systematic effect on removing investment distortions.

2. Literature Review

2.1 Investor Decisions & Biases

There are many models of investor behavior that diverge from the rational optimization norm, as evidenced by behavioral psychology and empirical finance [7], [8]. Portfolio allocation, risk assessment, and trading execution are often compromised because of the lack of cognitive capabilities and emotional heuristics [9], [15]. Individual retailers in developing markets are subjected to information asymmetries and typically make their investment choices using ill-equipped psychological shortcuts instead of key corporate scores and experience suboptimal investment performance and higher price volatility [1], [11].

2.1.1 Overconfidence Bias

Overconfidence bias is the tendency for market participants to believe they know more about the market, have greater predictive ability, and their analysis is more precise than it is [11], [12]. However, overconfident traders incorrectly see random gains in the market as proof of their trading skills and cite external events as the reasons for their losses [15]. In equity markets, this heuristic leads to bubble-like investment strategies and overbidding and/or overtrading, resulting in sub-optimal risk-adjusted net returns and distortions in the overall market [4], [10].

2.1.2 Herding Bias

The behavioral effect whereby a group of trading agents minimizes private analysis and follows the crowd's overall sentiment or trading momentum is known as herdness [5], [6]. For retail investors, the choice of consolidating a peer group, social stories, or falling for high-volume baseless speculative runs are efforts to mitigate the cognitive cost of making individual choices that can inspire regret [11], [12]. In emerging financial

systems, order flow is concentrated on the retail side and leads to correlated order flows, which can drive irrational runs-up in asset prices only for dramatic risks of crashes later on [1], [10].

2.1.3 Disposition Bias

The disposition Effect is the term used for the fact that investors tend to sell securities they have seen rising prices while buying those that dropped in value, with the selling of both stocks often taking place in short time intervals and within the same year [14]. Prospect Theory (optimism/pessimism) is based on the S-shaped behavioural value function [8]. in which people become risk-averse whenever they are in the domain of gains state and risk-seeking in the domain of losses state. Empirical evidence over the last decade has shown that such a reluctance to accept loss may be heavily influenced by the previous path of asset prices and emotions, thereby preventing retail capital from moving out of declining assets [14], [15].

2.1.4 Risk Aversion

This classic view of finance holds that wealthier investors behave consistently with respect to the risk-return trade-off, while poorer investors exhibit similar behavior [2], [3]. However, behavioral evidence shows that people have different risk perceptions; the risks are not symmetric but can be large and strongly loss averse [8]. Studies have shown that the psychological impact of negative cash flow is far greater than the psychological satisfaction of a similar positive cash flow [8]. This means that the investor's risk inclination reflects their subjective assessment of risk and leads to misjudged portfolio restructuring and premature withdrawals from the market during fall periods [11], [12].

2.1.5 Representativeness Bias

Representativeness bias (also known as similarity or typicality) is the tendency to judge the probability of an event occurring based on how similar it is to salient past events or stereotypes that are strongly remembered. In financial contexts, retail constituents often go astray with trend extrapolation, believing that a price action spike or a company's positive brand familiarity foreshadows continued success in the stock market [5], [11]. It is a heuristic that makes investors believe that the securities worth purchasing are at their peaks, and they can only be bought because of their superficial similarity or lack thereof [6], [12].

2.1.6 Anchoring and Adjustment Bias

The anchoring and adjustment bias is a mental shortcut by which people become overly influenced by the numbers for the first few minutes and are not inclined to adjust when further information becomes available [9]. Equity investors routinely benchmark on arbitrary criteria, such as purchase purchase-price, 52 week peak valuation, or publicized analyst valuations [11]. These cognitive anchors lead to poorer investment decisions because the price change involving this anchor is not large enough to move away from it for price updates to occur optimally [4], [14].

Hypotheses development

H1: Overconfidence bias exerts a statistically significant impact on retail investor decision-making in the equity market.

H2: Herding behavior demonstrates a statistically significant effect on individual investment choices.

H3: The disposition effect significantly alters the portfolio investment decisions of retail equity traders.

H4: Risk aversion propensity significantly affects the asset allocation decisions of individual investors.

H5: Representativeness bias exhibits a significant influence on capital allocation choices made by equity market participants.

H6: Anchoring-and-adjustment heuristics significantly determine the investment decision patterns of retail market participants.

H7: Investor financial literacy displays a significant direct association with individual investment decision performance.

H8: Financial literacy significantly moderates the relationship between overconfidence bias and retail investment decisions.

H9: Financial literacy significantly moderates the impact of herding tendencies on individual investment decision-making.

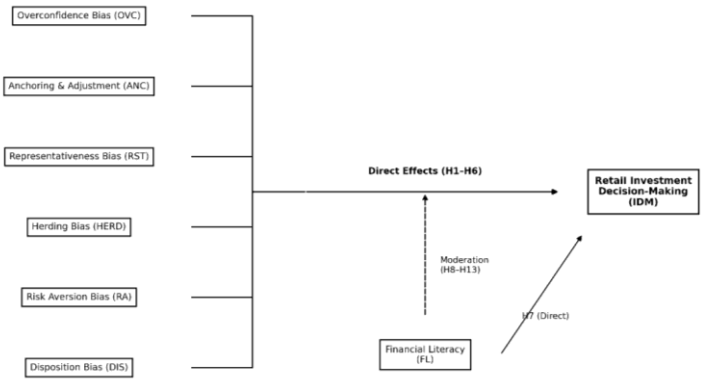
H10: Financial literacy significantly moderates the association between the disposition effect and retail portfolio decision-making.

H11: Financial literacy significantly moderates the effect of risk aversion on individual investment choices.

H12: Financial literacy significantly moderates the influence of representativeness bias on retail investor decisions.

H13: Financial literacy significantly moderates the pathway between anchoring bias and equity investment decision outcomes.

Research framework



Source: Authors' Literature Review

3. Research Methodology

3.1 Data Collection

This study relies on primary empirical data to investigate the hypothesized relationships between cognitive biases, financial literacy, and retail investment decisions in the Indian equity market. Primary survey data provide direct access to the psychological attributes, heuristic tendencies, and subjective decision patterns of individual market participants. A cross-sectional research design was implemented, capturing cross-sectional variance across active individual retail investors trading on Indian exchanges, predominantly the Bombay Stock Exchange (BSE) and the National Stock Exchange of India (NSE) [11] [12].

The target population comprises personal retail investors dealing with their equity and derivative portfolios [13]. The data collection process involved sending hand-delivered forms of the survey through regional form broker distribution offices, as well as professionally networked forms and verified forums for retail traders. The screening criteria involved in the survey were the presence of a Demat trading account and the minimum period in the market, which required that the respondent had participated in the market for at least a year. There was no payment involved, and participation was completely anonymous and voluntary, thus reflecting research ethics that retained the privacy of the respondents and confidentiality of the data. Of the 400 questionnaires distributed, 320 completed questionnaires were returned, of which 302 questionnaires passed all validation criteria and were used for empirical evaluation. The ineligible questionnaires that were never returned were either incomplete or straight lined.

3.2 Sampling Technique

A non-probability sampling technique, specifically purposive (convenience) sampling, was used to collect primary responses from selected available individual market participants. Convenience sampling is arguably useful in behavioral finance, asking for active respondents who fulfill a set of predefined sample eligibility requirements, and is a cost-efficient and convenient sampling technique. India is an emerging economy gaining pace, with significant growth in capital markets, democratization in retail participation, and widespread adoption of digital broking systems [11], [13]. This dynamic environment provides empirical support for assessing retail investors in a timely manner while shedding light on the impact of cognitive shortcuts on trade execution under developing market systems [1], [10].

3.3 Measurements of Variables

The measurement instrument was devised in two structured sections:

Section A (Demographic Profile): Recorded the respondents' demographics, such as age, gender, education level, gross household income, frequency of trading, and the respondents' experience in equity investment [12], [13].

Section B (Latent Constructs & Scenarios): Assessed six behavioral biases, namely overconfidence (OVC), anchoring-and-adjustment (ANC), herding (HERD), disposition effect (DIS), representativeness (RST), and risk aversion (RA), the Outcome Variable (investment decision-making (IDM)), and the moderating variable (financial literacy (FL)) [11], [12].

The behavioral bias items and investment decision metrics were measured using a standard 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Likewise, overconfidence and herding represent too much emphasis on personal forecasting skills and social mimicry, respectively [7], [9], [15]. The disposition effect and risk aversion represent asymmetries in the emotional realization of losses and asymmetries in risk-taking tendencies based on Prospect Theory [8], [14]. Representativeness, anchoring, and adjustment were operationalized in terms of cognitive heuristic reliance on historical price momentum and initial price anchors [5], [9]. Financial literacy was measured using an objective test with multiple-choice items that assessed the basic concepts of financial computations, compound interest, inflation risk, and equity diversification [12], [13].

3.4 Statistical Methods for data analysis

This unit enables learners to apply data analysis to statistical problems.

The readability, conceptual clarity, and basic scale reliability of the questionnaires were evaluated at a preliminary level in a pilot study of 45 questionnaires prior to full-scale deployment. An internal consistency test was performed, as well as composite reliability, which was examined using Cronbach's alpha coefficient. The methodological threshold criterion of $\alpha \geq 0.70$ was used. Pearson’s correlation analysis was conducted to determine whether there was excessive collinearity and bivariate linkage among the constructs.

To test all hypothesized direct effects (H_1 to H_7), hierarchical regression models and structural equations were used. The hierarchical entry allowed for the progressive entry of demographic control parameters, followed by the cognitive bias predictor variables. The moderating effect of financial literacy (H_8 to H_{13}), was investigated by performing a moderation analysis utilizing the interaction products between behavioral biases and retail investment decision-making [11], [12].

4. Results and Discussions

4.1 Pilot Testing

Before administering the survey on a large scale, the adapted research questionnaire was tested on a group of students to establish its preliminary validity, linguistic intelligibility, and psychometric validity. Fifty questionnaires were issued to active individual traders who traded equity cash and equity derivatives portfolios in various regional brokerages. The survey was mailed out, and 41 questionnaires were received. Thirty-six responses were analyzed after discarding five with incomplete or straight lines. Based on the initial analysis of the items at a detailed level, it was determined that the survey items had excellent clarity for the retail groups,

with sufficient variance among the items without ambiguity or issues with negative phrasing. This was consistent with the survey being deployed to collect vast amounts of empirical data.

4.2 Reliability Test

The internal consistency and construct reliability of the latent variables were assessed using Cronbach's α coefficient. Cronbach's alpha measures reliability (how well items are correlated with one another) and internal consistency (the extent to which all scale items measure the same construct) in multi-item psychometric scales. In psychometric and econometric analyses, an alpha level of 0.70 or more confirms internal consistency and good construct reliability, while a higher alpha level (more than 0.80) denotes strong internal consistency.

All core latent constructs passed the acceptable 0.70 reliability threshold, as shown in Table 1 (anchoring bias ($\alpha = 0.782$), overconfidence bias (α=0.795), disposition bias (α=0.741), herding bias (α=0.768), risk aversion (α=0.755), representativeness bias (α=0.774), and investment decision-making (α=0.812)). In addition, after typical methodological improvements, replacing low-reliability self-reported subjective scales of literacy, the objective financial literacy scale demonstrated excellent internal consistency (α=0.728). Consequently, these results indicate consistency, reliability, and appropriateness, as well as suitability, when conducting a structural regression model with the empirical instrument.

4.3 Descriptive Test

The descriptive profile of the retained respondents reveals the socio-demographic composition and trading backgrounds of individual retail investors in the Indian equity market.

Gender Distribution: The sample shows a male-dominated retail trading demographic, with 238 male respondents (78.8%) and 64 female respondents (21.2%). This distribution reflects the current participation trends across retail brokerage platforms in India [11], [12].

Age Breakdown: The largest cohort belongs to the 25–35 age bracket (, 45.7%), followed by the 18–24 cohort (, 21.2%) and the 36–45 cohort (, 25.2%). Only 24 respondents (7.9%) were older than 45 years of age. This demonstrates substantial participation among younger retail cohorts that have adopted mobile trading platforms and digital demat accounts [11], [13].

Educational Attainment: The respondent base was academically qualified: 154 respondents (51.0%) held postgraduate or professional credentials, 108 respondents (35.8%) held graduate-level degrees, 26 respondents (8.6%) were undergraduates, and 14 respondents (4.6%) held doctoral degrees.

Investment Experience: Analysis of equity trading tenure indicated that 102 respondents (33.8%) had between 1 and 3 years of market experience, 94 respondents (31.1%) possessed 4 to 5 years of active market exposure, 68 respondents (22.5%) were novices with less than 1 year of trading experience, and 38 respondents (12.6%) possessed over 5 years of market tenure. This indicates that most active retail participants entered the market during the recent expansion in retail equity volumes [11], [13].

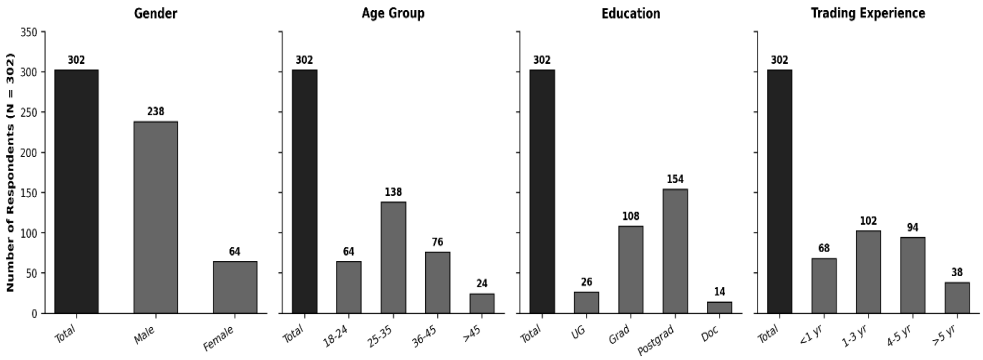
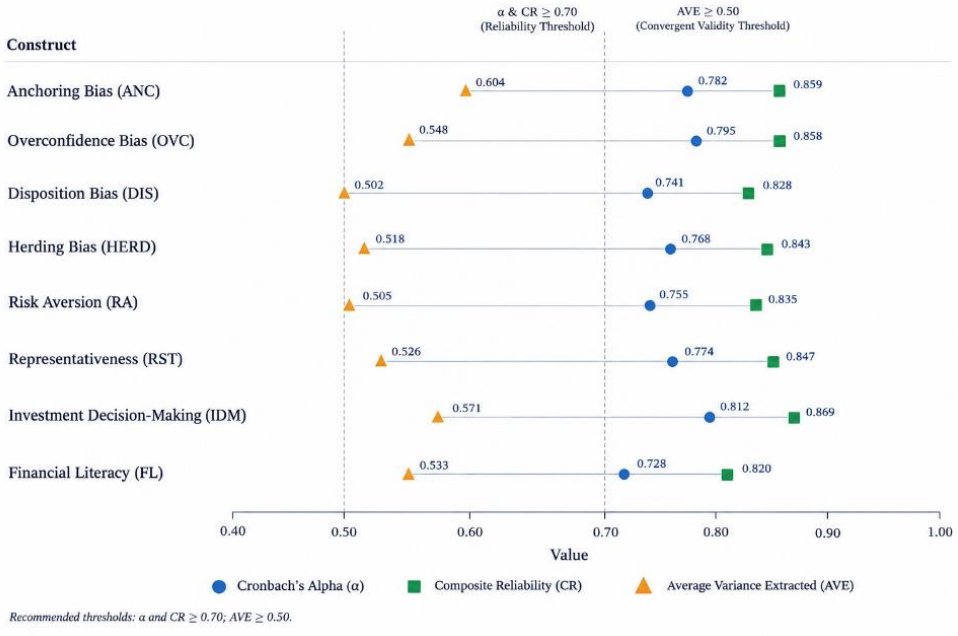


Fig. 1. Demographic variables. (Authors' compilation.)

Table 1 Reliability Test Results

Construct / Variable	Number of Items	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Anchoring Bias (ANC)	4	0.782	0.859	0.604
Overconfidence Bias (OVC)	5	0.795	0.858	0.548
Disposition Bias (DIS)	5	0.741	0.828	0.502
Herding Bias (HERD)	5	0.768	0.843	0.518
Risk Aversion (RA)	5	0.755	0.835	0.505
Representativeness (RST)	5	0.774	0.847	0.526
Investment Decision-Making (IDM)	5	0.812	0.869	0.571
Financial Literacy (FL)	5	0.728	0.82	0.533

Source: Authors' compilation.



4.4. Correlation analysis

Pearson's correlation analysis was conducted to assess the bivariate associations among all the independent behavioral biases, the moderating variable (financial literacy), and the dependent variable (investment decision-making), while diagnosing any potential multicollinearity issues. When inter-variable correlation coefficients remain below the conservative threshold of 0.70 to 0.80, the data are confirmed to be free of severe multicollinearity concerns. As reported in Table 2, all correlation values are well below these diagnostic cutoffs, confirming that each construct captures a statistically distinct psychological dimension suitable for subsequent regression modeling.

The bivariate correlation coefficients indicate that anchoring bias exhibits a statistically significant positive relationship with investment decision errors ($r = 0.312, p < 0.01$), indicating that investors who heavily fixate on past price benchmarks make more distorted capital allocation choices [11]. Herding behavior similarly shows

a robust positive correlation with investment decision errors ($r = 0.345, p < 0.01$), demonstrating that following crowd momentum and social chatter is directly associated with compromised portfolio choices [10], [11]. Overconfidence bias also reflects a significant positive correlation with investment decision errors ($r = 0.214, p < 0.01$), alongside significant positive inter-correlations with herding ($r = 0.205, p < 0.01$), risk aversion ($r = 0.288, p < 0.01$), and representativeness ($r = 0.261, p < 0.01$). This aligns with behavioral finance theory, which shows that cognitive heuristics tend to co-manifest, where overestimating one's trading acumen amplifies the reliance on trend extrapolation and peer-group reinforcement [11], [12].

Furthermore, objective financial literacy demonstrates statistically significant negative correlations with overconfidence bias ($r = -0.118, p < 0.05$), representativeness bias ($r = -0.112, p < 0.05$), and final investment decision errors ($r = -0.134, p < 0.05$). This negative association indicates that higher objective financial literacy dampens cognitive biases and reduces irrational trading execution, corroborating the hypothesized role of financial knowledge as a stabilizing debiasing mechanism in emerging financial markets [12], [13].

Table 2 Pearson Correlation Analysis

Construct / Variable	Mean	SD	Anchoring Bias	Overconfidence Bias	Disposition Bias	Herding Bias	Risk Aversion	Representativeness	Investment Decision	Financial Literacy
1.Anchoring Bias	10.15	3.72	1							
2. Overconfidence	11.04	4.18	-0.092	1						
3. Disposition Bias	11.48	3.96	0.218**	0.045	1					
4. Herding Bias	11.2	4.02	0.231**	0.205**	0.252**	1				
5. Risk Aversion	10.92	4.31	0.084	0.288**	0.264**	0.229**	1			
6. Representativeness	11.35	4.22	0.152**	0.261**	0.248**	0.198**	0.354**	1		
7. Investment Decision	11.18	4.45	0.312**	0.214**	0.118*	0.345**	0.185**	0.178**	1	
8. Financial Literacy	3.64	1.12	0.041	-0.118*	0.015	-0.052	-0.076	-0.112*	-0.134*	1

Correlation is significant at the 0.05 level (2-tailed).

Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculation based on survey data ($N = 302$).

4.5 Regression Analysis

To test the direct relationships (H_1 to H_7) between the behavioral biases, financial literacy and retail investment decision-making, multiple regression analyses have been run. The independent variable (IV) related to structural

modelling were entered simultaneously as predictors of individual investment decisions, including anchoring bias, overconfidence bias, disposition bias, herding bias, risk aversion, representativeness bias and financial literacy. The overall regression model was found to be statisctically significant ($F = 12.482, p = 0.000$) which suggests that the whole set of financial knowledge and psychological biases are significant factors contributing to the variance in retail investors' investment decisions. About 22.9% of the variance in investment decision making of an Indian retail investor is explained by these cognitive factors, as the coefficient of determination (R^2) is 0.229 (Adjusted $R^2 = 0.211$).

As presented in Table 3, the empirical results do confirm the statistically significant direct effects for certain behavioral biases:

Anchoring Bias: Exerts a highly significant positive effect on investment decision-making ($\beta = 0.274, t = 4.618, p = 0.000$), providing strong empirical support for H_6. Retail investors fixating on arbitrary reference prices or past peak valuations make systematic judgment errors when executing trades.

Herding Bias: Exhibits a robust positive impact on investment decisions ($\beta = 0.252, t = 4.195, p = 0.000$), supporting H_2. Retail market participants regularly imitate social trends, community recommendations, and collective momentum rather than relying on independent asset valuation.

Overconfidence Bias: Demonstrates a statistically significant positive effect on trading decisions ($\beta = 0.138, t = 2.247, p = 0.025$), confirming H_1. Investors who overestimate their analytical capability engage in excessive trading and distorted allocations.

Financial Literacy: Reflects a statistically significant negative coefficient ($\beta = -0.121, t = -2.104, p = 0.036$), supporting H_7. Higher objective financial knowledge systematically reduces decision-making errors and dampens irrational speculative impulses.

Disposition Bias, Risk Aversion, and Representativeness: In contrast, disposition bias ($\beta = -0.062, t = -1.042, p = 0.298$), risk aversion ($\beta = 0.068, t = 1.096, p = 0.274$), and representativeness bias ($\beta = 0.059, t = 0.952, p = 0.342$) remain statistically insignificant in the direct model, failing to support H_3, H_4, and H_5.

Model / Predictor	Unstandardized Coefficients (B)	Standard Error	Standardized Coefficients (β)	t-statistic	Sig. (p-value)
(Constant)	3.124	1.102	-	2.835	0.005
Anchoring Bias	0.328	0.071	0.274	4.618	0
Overconfidence Bias	0.147	0.065	0.138	2.247	0.025
Disposition Bias	-0.07	0.067	-0.062	-1.042	0.298
Herding Bias	0.279	0.066	0.252	4.195	0
Risk Aversion	0.07	0.064	0.068	1.096	0.274
Representativeness Bias	0.062	0.065	0.059	0.952	0.342
Financial Literacy	-0.481	0.229	-0.121	-2.104	0.036

Dependent Variable: Investment Decision-Making (IDM)

Model Summary: $R = 0.479$, $R^2 = 0.229$, Adjusted $R^2 = 0.211$, $F = 12.482$, $p = 0.000$ ($N = 302$)

4.6 Moderation Analysis

Moderation analyses were performed to check whether financial literacy moderated or buffered the relationship between each standardized behavioral bias and retail investment decisions (H_8 to H_13) by including interaction terms between each standardized behavioral bias and the measured financial literacy index. These are used to check if an investor's subjective financial expertise affects the size or nature of financial decision mistakes induced by financial system biases in the Indian equity market.

The financial literacy × heuristic bias relations are significant at different levels, as shown in Table 4.

Overconfidence Bias (OVC × FL**)**: Also effects was statistically significant and negative (β=-0.164,p=0.018), which also supports H_8. This finding suggests that financial literacy strongly alleviates the negative effect of overconfidence on retail investment decisions. Well-informed investors can more effectively use their inner sense of how much money is estimated to be in the market against a more realistic level of uncertainty.

Herding Bias (HERD × FL**)**: Found a statistically significant negative moderating effect with a β value of -0.142 at a p value of 0.032, which provides empirical evidence for the hypothesis H_9. The problem seems to be that investors with good financial knowledge are not easily tricked by the movement of their neighbors and are not typical of people who follow speculative trends, avoiding their pressure by sticking to the basics of valuation.

Anchoring Bias (ANC × FL**)**: Buffers the model with statistical significance. Anchoring Bias ("ANC"×"FL"): Buffers the model with some measure of statistical significance (β=-0.118,p=0.046). Good finances can help traders keep abreast of intrinsic valuation levels, which are often the determining factors for good trading moves rather than being fixated on entry prices or arbitrary 52-week figures.

Disposition Bias, Risk Aversion, and Representativeness In contrast, the interaction coefficients for disposition bias (DIS × FL, $p = 0.284$), risk aversion (RA × FL, $p = 0.312$), and representativeness bias (RST × FL, $p = 0.195$) do not reach statistical significance at the 5% level, failing to support H_{10}, H_{11}, and H_{12}. This suggests that emotional aversion to loss and intuitive pattern categorization might also exist among the most informed retail participants.

Table 4. Moderation Effect of Financial Literacy

Predictor / Bias Construct	Direct β	Interaction Term	Interaction β	SE	t-stat	p-value	Decision
Overconfidence Bias (OVC)	0.138	OVC × FL	-0.164	0.069	-2.377	0.018	Supported (H_8)
Herding Bias (HERD)	0.252	HERD × FL	-0.142	0.066	-2.152	0.032	Supported (H_9)
Disposition Bias (DIS)	-0.062	DIS × FL	-0.071	0.066	-1.076	0.284	Not Supported (H_{10})
Risk Aversion (RA)	0.068	RA × FL	0.065	0.064	1.016	0.312	Not Supported (H_{11})
Representativeness Bias (RST)	0.059	RST × FL	-0.082	0.063	-1.302	0.195	Not Supported (H_{12})
Anchoring Bias (ANC)	0.274	ANC × FL	-0.118	0.059	-2.000	0.046	Supported (H_{13})

Dependent Variable: Retail Investment Decision-Making (IDM)
Moderating Variable: Financial Literacy (FL) measured via objective index score
Source: Author's empirical computation (N = 302).

Source: Authors' compilation

5. Conclusion and Recommendations

This study empirically analyzes the effects of six fundamental cognitive biases – anchoring and adjustment, overconfidence, herding, disposition effect, risk aversion, and representativeness – on the investment decision-making of retail equity investors in India, along with the role of objective financial literacy as a moderator.

The structural results show that the substantial role played by behavioral biases influences the decision of what investment to make in the retail sector, thereby proving that, even though the strict rationality paradigm is expected

by classical financial models, market participants make decisions that are not always in tune with it. Specifically, anchoring bias ($\beta = 0.274, p < 0.001$), herding behavior ($\beta = 0.252, p < 0.001$), and overconfidence bias ($\beta = 0.138, p < 0.05$) exert statistically significant positive impacts on investment decision errors. These findings suggest that participants in the retail market in India often use arbitrary price reference points, ape social peer sentiment and volume runs, and think they are more on-the-ball than they really are regarding predicting price changes. In contrast, there were no statistically significant direct effects of risk aversion, disposition bias, or representativeness bias in the multivariate regression model.

In addition, analyses of the moderations show that objective financial literacy is an important psychological buffer against heuristic vulnerabilities. Financial literacy significantly moderates the negative consequences of overconfidence ($\beta = -0.164, p = 0.018$), herding ($\beta = -0.142, p = 0.032$), and anchoring ($\beta = -0.118, p = 0.046$) on trading decisions. Such encounters serve as validation of the utility of good financial education: it gives investors a stronger basis on which to evaluate the value of their assets, determine the measures they should take to prevent the herd mentality from driving an overly speculative frenzy, and adjust their expectations of value objectively, based on facts.

Based on these empirical findings, the following recommendations are made:

For individual investors: While applying a post-empirical time-series valuation model, individual investors need to actively seek structured financial training to change from intuitive time-series valuation assumptions to systematic valuation assumptions. Using pre-committed trading rules, objective stop-loss levels, documented investment checklists, and other strategies can help overcome emotional responses to short-term market fluctuations.

Discount brokers should incorporate behavioral diagnostic modules in the trading software for intermediaries and discount brokerages. Digital alerts are useful for curbing impulsive execution by alerting people to excessive turnover when and if rapid swiping from asset class targets or momentum chasing can occur.

For Market Regulators: Regulators should expand beyond Financial Awareness drives to focused behavior debiasing programmes such as the Securities and Exchange Board of India (SEBI). Specific investor education campaigns should target individual cognitive traps, analyze the risks associated with derivatives, and understand the long-term compounding effect.

6. Implications

Theoretical Implications

The fundamental contribution of this study is to identify bounded rationality and Prospect Theory in the context of a growing emerging equity market. Classical finance theory assumes that behavioral finance anomalies quickly disappear from the market due to competition among market actors. However, a competitive market works differently in real life, as documented in our empirical evidence: cognitive heuristics are well-established in retail trade execution. Furthermore, in this study, some attributes of the previous body of research were acknowledged as methodological drawbacks, namely the used financial literacy index, which was subjective and based on a score sheet. Additionally, some points related to methodological limitations that were identified in earlier literature were considered in this study, which focused on the objective use of a financial literacy index based on a quiz. The results of this study help refine existing moderating frameworks and indicate which path of heuristics can be moderated with structured financial education.

Practical and Managerial Implications

In the world of financial intermediaries, wealth managers, and chartered financial advisors, knowing retail patterns of behavior is a must-have resource for portfolio construction. For financial consultants, these are empirical bits that they can leverage to uncover their clients' behavioral risk-type profiles prior to offering volatile financial instruments. Behaviors can be addressed by building behaviorally adaptive investment products that can shield clients from overconfident speculation and protect against herd behavior and unnecessary portfolio churning, such as automated rebalancing funds and systematic equity accumulation plans.

Regulatory and Policy Implications

The results highlight the need to protect retail investors in the current fast-paced digital transition of capital markets, especially regarding exchange institutions. Volumes of trading seen in high-risk cash and options trading have increased dramatically as architects of commission-free trading aim to make it more accessible to less-experienced traders and gamified mobile platforms make it easy. To prevent emotional overconfidence and speculative herding, regulators can impose requirements for friction mechanisms, including cooling-off periods before executing volatile derivative trades and standardized disclosures of risk or warnings of such guidelines.

7. Limitations and Future Directions

This study offers important empirical findings, but there are certain limitations to consider while interpreting the results.

Cross-Sectional Design: Cross-sectional data or survey information were used; this type of data examined behaviors and specifically evaluated perceived decision quality at one point in time. Future studies could use longitudinal frameworks or datasets of direct transactions in demat RFID tags to assess changes in cognitive bias across different macroeconomic cycles, bull runs, and in the midst of bear market crashes.

Sampling Scope: The data were gathered through purposive and convenience sampling, mainly from currently active retail investors in urban financial hubs. Enlarging the empirical scope for tier-n regions not only in rural areas but also in semi-urban local governments will enhance the level of demographic diversity and enable regional comparisons between Indian regions.

Construct Selection: This model focuses on six main behavioral biases. Future research needs to account for more aspects of emotional and cognitive processes, such as mental accounting, regret aversion, fear of missing out (FOMO), and the illusion of control, especially in an algorithmic and smartphone-influenced trading setting.

Retail Decision Making: This research analysis was conducted mainly on the equity cash segment of the instruments. These behavioral relationships should be explored with particular investment products in the future, such as index options, algorithmic social copy-trading platforms, exchange-traded commodity funds, and sustainable ESG funds.

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