“Beyond market anomalies: How heuristics and perceived efficiency shape investor behavior in developing markets”

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BEYOND MARKET ANOMALIES: HOW HEURISTICS AND PERCEIVED EFFICIENCY SHAPE INVESTOR BEHAVIOR IN DEVELOPING MARKETS

Abstract

Cognitive biases often influence investor behavior in developing capital markets, leading to market anomalies and affecting overall market efficiency. With the increasing integration of global financial markets and the growing participation of retail investors, understanding these biases is more critical than ever. While market anomalies have been extensively studied in developed markets, their influence in developing economies remains under-explored. This study aims to examine the impact of heuristic biases on investment decisions, focusing on Nepal's stock market. Structural Equation Modeling is used to assess how perceived market efficiency mediates the relationship between heuristic biases and investor behavior. Data were collected from purposively selected 403 active individual investors in Nepal Stock Exchange (NEPSE). The findings reveal that representative and overconfidence biases significantly and positively influence investment decisions and market efficiency. Specifically, investors exhibiting these biases are more likely to make confident and bold investment choices, believing in their ability to predict market movements accurately. Furthermore, the study finds that perceived market efficiency mediates the relationship between anchoring and adjustment bias and investment decisions, suggesting that investors who rely heavily on initial information (anchors) adjust their decisions based on their perceptions of market efficiency. The results highlight the critical role of heuristic biases in shaping investor behavior and stress the importance of market efficiency in this process. The study emphasizes the need to enhance investor awareness of these biases and implement policies to improve market transparency and efficiency. Such measures are vital for mitigating risks and fostering a more robust and resilient financial market in developing economies like Nepal.

Keywords investment behavior, overconfidence, representativeness, availability, anchoring and adjustment, market efficiency, structural equation modeling, Nepal

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INTRODUCTION

Empirical evidence within capital markets shows the significant influence of market anomalies and behavioral factors on investment decision-making (Sebastian et al., 2020; Javed, Bagh, & Razzaq, 2017; Shah, Ahmad, & Mahmood, 2018). Despite traditional finance theories assuming rational investor behavior, the reality often diverges, with investors exhibiting irrational tendencies such as purchasing assets without proper valuation, following trends set by the crowd in the markets, engaging in excessive trading, and relying on historical performance (Suresh, 2024; Shantha et al., 2018; Shagufta et al., 2020). Understanding and explaining these behaviors necessitate a deeper exploration of the behavioral aspect inherent in investment decision-making.

In finance theory, the capital market is viewed as a reflection of the broader economy, underpinned by assumptions of rational investor

behavior. However, a large number of anomalies exist in the capital markets challenging such conventional wisdom of finance. Recently, the COVID-19 pandemic highlighted the fragility of rational theory of finance, particularly in the context of developing markets. Despite weak economic indicators, the Nepalese stock market index surged to an unprecedented high in August 2021, only to experience abrupt declines and erratic fluctuations in subsequent months. Furthermore, due to Nepal's collectivistic society and emerging capital market in the South Asian region, investment decisions and market trends are heavily influenced by the psychological and cognitive factors of individual investors (Gautam, 2013; Gurung et al., 2024). This evidence shows the importance of understanding the behavioral aspects in shaping the dynamics of the capital market of developing economies.

1. LITERATURE REVIEW AND HYPOTHESES

Investor rationality has become a contentious issue, particularly as traditional finance theories struggle to explain anomalies observed in the stock market (Prosad et al., 2015). Standard finance theories rest on four fundamental principles: the assumption of rational investors, the belief in efficient and perfect capital markets, the application of mean-variance theory for portfolio construction, and the consideration of the risk-return tradeoff (Statman, 2017). However, behavioral finance challenges each of these principles, suggesting that investors are not always rational but rather ordinary individuals and that markets can be inefficient and difficult to outperform (Prosad et al., 2015).

Researchers have identified various biases, such as overconfidence, representativeness, availability, and anchoring and adjustment biases, which shape investors' perceptions and behaviors. Moreover, empirical studies have examined the interrelationship between these biases and investment decisions, highlighting the importance of market efficiency. While much of this literature has focused on developed markets, there is a growing interest in understanding these phenomena within the context of developing markets, where unique socio-economic factors further complicate investor decision-making. This review synthesizes key findings and discusses the relevance of this literature in understanding investor behavior in developing markets, with a specific focus on Nepal's emerging capital market.

The rationality of investors has been a subject of debate, particularly as traditional finance theories grapple with explaining anomalies observed in the stock market. Theories of finance rely on the assumption of rational investors, efficient capital markets, mean-variance portfolio construction, and the risk-return tradeoff (Statman, 2017). These theories collectively provide a framework for understanding investment decision-making, asset pricing, and portfolio management strategies in financial markets. The assumption of rationality insists that investors make decisions based on all available information to maximize their utility or wealth.

However, behavioral finance challenges these assumptions, suggesting that investors are ordinary individuals subject to biases, and markets can be inefficient (Prosad et al., 2015). This asserts that investors are not always rational actors but are instead influenced by cognitive biases and emotional factors in their decision-making processes. By acknowledging the presence of these biases, behavioral finance highlights the potential for market inefficiencies arising from systematic deviations from rational behavior.

Kahneman and Tversky (1974) introduced heuristics like representativeness, availability bias, and anchoring and adjustment. These heuristics are mental shortcuts that shed light on investors' decision-making under conditions of complexity and incomplete information. Representativeness bias sees investors making decisions based on mental stereotypes, often emphasizing recent experiences while disregarding long-term average returns (Shefrin, 2007). Empirical research shows that this bias positively influences investors' tendencies to purchase stocks (Shah et al., 2018; Khan et al., 2017). Availability bias leads investors to rely on readily accessible information in the market, positively impacting investment decision-making by increasing average returns (Nofsinger & Varma, 2013; Javed et al., 2017; Ikram, 2016). However, it can also lead to judgment errors when investors make decisions based solely on this

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accessible information (Hadi, 2017). Anchoring and adjustment bias influence how individuals perceive probabilities, as they rely heavily on initial information to make decisions (Shah et al.., 2018). While it can guide investors to consider relevant factors, it can also result in inappropriate investment decisions, leading to forecasting or judgment errors (Keswani et al., 2019; Khan et al., 2017). Overconfidence bias manifests itself as unwarranted faith in one's judgments, leading to irrational decision-making and excessive trading in investment contexts (Park et al., 2010; Statman, 2017). While initially appearing beneficial, overconfidence can blind investors to risks, overestimating potential profits (Bakar & Yi, 2016; Javed, Bagh & Razzaq, 2017; Gurung et al., 2024). The exploration of these cognitive biases serves as a cornerstone in understanding how investors navigate decision-making amid complexity and incomplete information.

Market efficiency, determined by factors like price changes, market information, and customer preferences, influences stock market investments (Keswani et al., 2019; Luong & Ha, 2011). Empirical studies have shown a positive correlation between heuristics and market efficiency, suggesting that the reliable use of information contributes to increased market efficiency, while irrational investors' behavior leads to inefficiencies (Shah et al., 2012; Statman, 2017). These findings emphasize the importance of understanding the underlying relationship between cognitive biases and market efficiency in guiding investment decisions.

Despite a large body of literature linking heuristics to investment decisions, market efficiency, and investment choice, there is a notable gap in research, particularly concerning the use of market efficiency as a mediating variable. The present study bridges this gap by exploring how perceived market efficiency could mediate the relationship between heuristic biases and investment choices within the Nepalese capital market, an emerging market where behavioral finance is a significant concern. Additionally, the paper seeks to investigate the influence of heuristic biases on investment choices and perceived market efficiency among individual active investors in Nepal's stock market as conceptualized in Figure 1.

Based on the conceptual framework, following hypotheses have been formulated:

H1: Heuristic biases significantly affect the investment decisions of individual investors.

H1a: Overconfidence bias significantly affects investment decision-making.

H1b: Representative bias has a significant influence on investment decisions.

H1c: Investment decision is affected by availability bias.

H1d: There is a significant effect of anchoring and adjustment bias on investment decisions.

H2: Perceived market efficiency is significantly affected by heuristic biases.

H2a: Overconfidence bias significantly affects market efficiency.

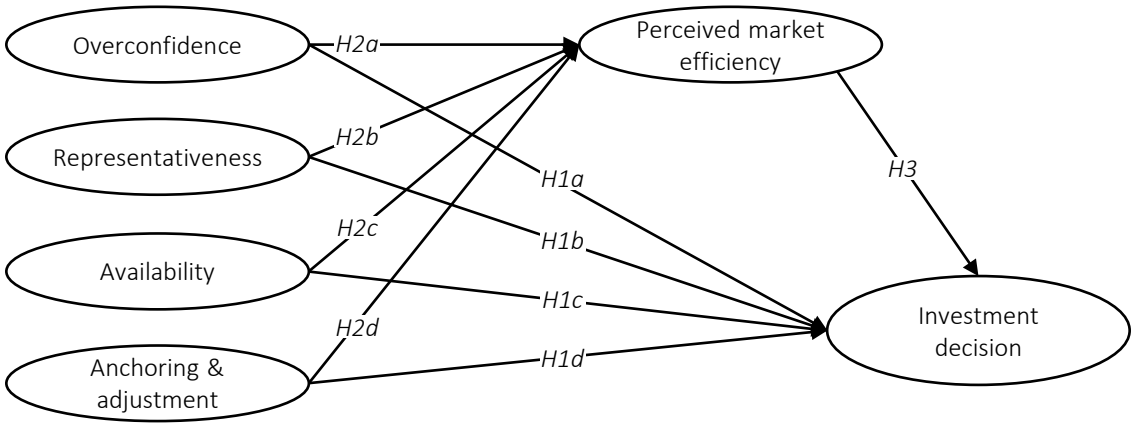

Figure 1. Conceptual framework

H2b: Representative bias has a significant influence on market efficiency.

H2c: Market efficiency is significantly affected by availability bias.

H2d: There is a significant effect of anchoring and adjustment bias on market efficiency.

H3: Market efficiency positively affects investment decision-making.

H4: Market efficiency mediates the relationship between heuristic biases and investment decisions.

H4a: Perceived market efficiency mediates the relationship between overconfidence bias and investment decisions.

H4b: There is a mediating role of perceived market efficiency in the relationship between representative bias and investment decisions.

H4c: Perceived market efficiency mediates the relationship between availability bias and investment decision.

H4d: Perceived market efficiency mediates the relationship between anchoring and adjustment bias and investment decisions.

2. METHODS

This paper employs a survey-based approach to collect data from active individual investors in the Nepal Stock Exchange. Investors are considered active if they trade securities more than three times in a month. The survey constitutes a sample size of 403 investors using the purposive sampling technique by following the approach of Hulland et al. (2017). For an adequate sample size in multivariate analysis, a common guideline is to have at least ten times the number of items used to measure the construct, resulting in a suggested sample size of 380 for this study with its 38-item questionnaire (Hair et al., 2013). Structural Equation Modeling (SEM) was employed to analyze the relationships among variables, using SPSS and AMOS software for data analysis.

To measure the research variables, a 6-point Likert scale was utilized, a methodological approach widely recognized for its efficacy in assessing respondents' opinions and attitudes (Luong & Ha, 2011). The points on the scale range from 1 to 6, corresponding to extremely disagree, highly disagree, somewhat disagree, somewhat agree, highly agree, and extremely agree. Table 1 outlines the measurements and operationalization of variables, which are adapted from the relevant literature.

The tested items were carefully selected from the existing literature to ensure that they accurate-

Table 1. Operationalization of the variables

Variable	Items	Operational definition	Source(s)
Investment Decision (ID)	ID1 to ID8	The number of trades made by the investor, buying underpriced shares, value-oriented stocks, growth-oriented stocks, and active or passive-oriented activities of the investor	Nyamute (2016).
Market efficiency (ME)	ME1 to ME6	Market factors that affect investment decisions: Change in price, reaction to price changes, market information, stock trends, customer preference, and essentials of underlying stocks	Luong and Ha (2011), Kengatharan and Kengatharan (2014).
Overconfidence bias (OB)	OB1 to OB6	Certainty about an unrealistic response, ability to select better stocks than others, self-attribution bias, illusion of control, illusion of knowledge, high-risk propensity, excessive trading	Waweru et al. (2008).
Representativeness bias (RB)	RB1 to RB5	Use of experiences to guide the decision-making process, judgment, the degree of similarity, explanation for investor overreaction, and law of small numbers.	Luong and Ha (2011), Shah et al. (2018).
Availability bias (AB)	AB1 to AB7	Excessive use of easily available information, familiar with easily acquired information, despite the basic principles of so-called optimal portfolio management.	Luong and Ha (2011), Nada and Moamer (2013).
Anchoring & Adjustment bias (AAB)	AAB1 to AAB6	Use some initial prices to estimate, as the selling decision always depends on the initial buying price, under-reaction to unexpected changes, almost an emphasis on recent experience, and being more optimistic in increasing trend market and more pessimistic in decreasing trend market	Luong and Ha (2011), Nada and Moamer (2013).

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ly measured the intended constructs, with some adjustments made for contextual relevance. A pilot study with 50 respondents validated the research instruments, indicating adequate reliability (Cronbach's alpha > 0.70). Moreover, face and content validity assessments were conducted, with expert review and modification of questionnaire items to enhance validity. To mitigate potential response bias, investors were contacted both in person and online using Google Forms, with the questionnaires. Out of the 500 distributed self-administered questionnaires, 403 usable responses were collected

3. RESULTS

Capturing the sentiments of individual investors, the paper uncovered a diverse demographic landscape among respondents. The findings reveal a notable gender skew, with male investors comprising a substantial majority (80.13%) compared to their female counterparts. This shows a prevailing trend in Nepalese society where investment decision-making remains predominantly male-driven. Turning to age demographics, the study highlights a strong attraction among young investors toward the stock market, with 63% falling within the 31 to 40 years age group. Additionally, a significant 20% of respondents belong to the 41 to 50 age group, indicating a broad spectrum of age diversity in market participation. Furthermore, the data reflect a majority of married investors (60.33%) and those with advanced degrees (75.82% with master's degrees and 17.34% with bachelor's degrees). Regarding experience levels, a substantial proportion of investors (45.86%) bear 5 to 10 years of investment experience followed by 33.21 percent in 3 to 5 years of experience, further illustrating the growing maturity of the Nepalese stock market as an emerging investment frontier.

3.1. Measurement model

Table 2 indicates the model fit indices. In the initial measurement model, the Relative Chi-Square (CMIN/DF = χ 2/df = 1335.62/506, $p < .05$) indicates that the model is accepted. Similarly, CFI = .86 indicated reasonably not fitted to the data. Besides, Standardized Root Mean Square Residual (RMR) = .084 and RMSEA=.064 also suggested that the model did not fit the data. CFA checks the reliability and validity of the latent variables (Anderson & Gerbing, 1988). Moreover, a result of the convergent and discriminant validity indicated that the current measurement model is inappropriate.

To improve the initial measurement model, in the first step, run the EFA to detect items with cross-loading problems. The items ID4, ME2, OB6, AB6,

Table 2. Initial and improved measurement model indices

Fit Index	Initial measurement model		Improved measurement model		General Rule for Acceptable Fit
	Value	Evaluation	Value	Evaluation	
Higher indices					
Relative Chi-Square	2.60	Acceptable	2.441	Acceptable	≤ 3 (Schreiber et al., 2006) < 5 (Hair et al., 2017)
CFI	0.86	Not acceptable	0.932	Acceptable	> 0.90 (Hair et al., 2017)
GFI	0.839	Not acceptable	0.91	Acceptable	> 0.90 (Hu & Benther, 1998)
AGFI	0.810	Acceptable	0.87	Acceptable	>0.80 (Hair et al., 2017)
TLI	0.854	Not acceptable	0.90	Acceptable	>0.90 (Hair et al., 2017)
IFI	0.861	Not acceptable	0.91	Acceptable	>0.90 (Hair et al., 2017)
NFI	0.794	Not acceptable	0.86	Acceptable	>0.90 (Hair et al., 2017)
Parsimony Goodness-of-Fit Index					
PNFI	0.716	Acceptable	0.734	Acceptable	>0.50 (Hair et al., 2017)
PCFI	0.776		0.789		
PGFI	0.713		0.714		
Lower indices					
RMR	0.084	Not acceptable	0.0734	Acceptable	≤ 0.08 (Hu and Bentler, 1998)
RMSEA	0.064	Not acceptable	0.053	Acceptable	< 0.08 with CFI > 0.92 (Hair et al., 2017)
PCLOSE (> 0.05)	0.000	Not acceptable	0.052	Acceptable	

and AAB2 were dropped out in the first round. Again, AB2, AB3, and OB4 were dropped out in the second round based on the diagonal value of anti-image correlation that measures the sample adequacy less than 0.60, commonalities value of extraction less than 0.5, factor loading less than 0.5, and factor that has the cross-loading problem (Hair et al., 2010). In addition, if the items have low multiple R^2 (generally, $R^2 < 0.20$), then the item(s) should be dropped out from analysis because it is the indication of a very high level of error (Hooper et al., 2008). If the item has low β ($r < 0.70$) and a high correlation with the residual term, then it should be removed from the analysis (Anderson & Gerbing, 1988). In the measurement model, standardized estimates depicted that OB5 ($r = 0.61$), AAB6 ($r = 0.60$), and correlation coefficient of error term with other items are more than two. Therefore, these items were removed from the analysis. Finally, the indices for the improved measurement model indicate the data are suitable for further study.

Table 3 presents the convergent and discriminant validity measuring the appropriateness of the model (Hair et al., 2017). For convergent validity, values of the Composite reliability (CR) should be higher than 0.70, the Average Variance Extracted (AVE) greater than 0.50, and CR should be greater than AVE, and for discriminant validity, the AVE should be greater than MSV (Hooper et al., 2008; Hair et al., 2017). All indicators are maintained at a minimum threshold as recommended. Therefore, there is no validity issue, and the hypothesized measurement model fits the data well.

In addition, when CFA estimates the model, the reliability of the variables tested by McDonald's Omega is more appropriate than Cronbach's Alpha (Hayes & Coutts, 2020). Based on this evidence, the measurement model is also applicable for further analysis because all Omega values of variables maintain a minimum threshold (Hayes & Coutts, 2020).

3.2. Structural model

Before running the structural model, the correlation among determinants of heuristics was checked, and a low correlation among the subconstructs of heuristics was noticed. This indicates that the first-order construct model is more suitable for this study. This paper used three structural models to test the proposed hypotheses.

Figure 2 reveals the standardized path coefficient. Low correlation among constructs indicated that there is no multicollinearity problem in the model. Moreover, the coefficient of determination shows the exogenous constructs (determinants of heuristics) can interpret an 18 percent variance in ID.

Table 4 shows all the estimates are significant except for availability bias. The OB positively and significantly influences ID ($\beta = 0.281$, $p < 0.01$).

Table 3. Construct validity and reliability

	CR	AVE	MSV	MaxR(H)	ID	ME	OB	RB	AB	AAB	Omega
ID	0.884	0.521	0.105	0.887	0.722						0.886
ME	0.866	0.566	0.077	0.874	0.156	0.752					0.868
OB	0.762	0.521	0.105	0.801	0.324	0.277	0.721				0.762
RB	0.844	0.520	0.086	0.847	0.256	–0.011	0.071	0.721			0.845
AB	0.838	0.566	0.086	0.853	0.005	0.054	–0.051	0.293	0.752		0.840
AAB	0.802	0.505	0.042	0.811	0.185	0.204	0.204	–0.037	–0.126	0.711	0.796

Notes: ID = investment decision; ME = perceived market efficiency; OB = overconfidence bias; RB = representativeness bias; AB = availability bias; AAB = anchoring & adjustment bias; CR = composite reliability; AVE = average variance extracted.

Table 4. Structural path coefficient of determinants of heuristics on investment decision

Hypothesis	Path Name			Standardized Estimate	P-value	Results
H1a	ID	←	OB	0.281	***	Supported
H1b	ID	←	RB	0.254	***	Supported
H1c	ID	←	AB	–0.040	0.522	Not Supported
H1d	ID	←	AAB	0.141	***	Supported

Note: p*** means 1 percent significance level.

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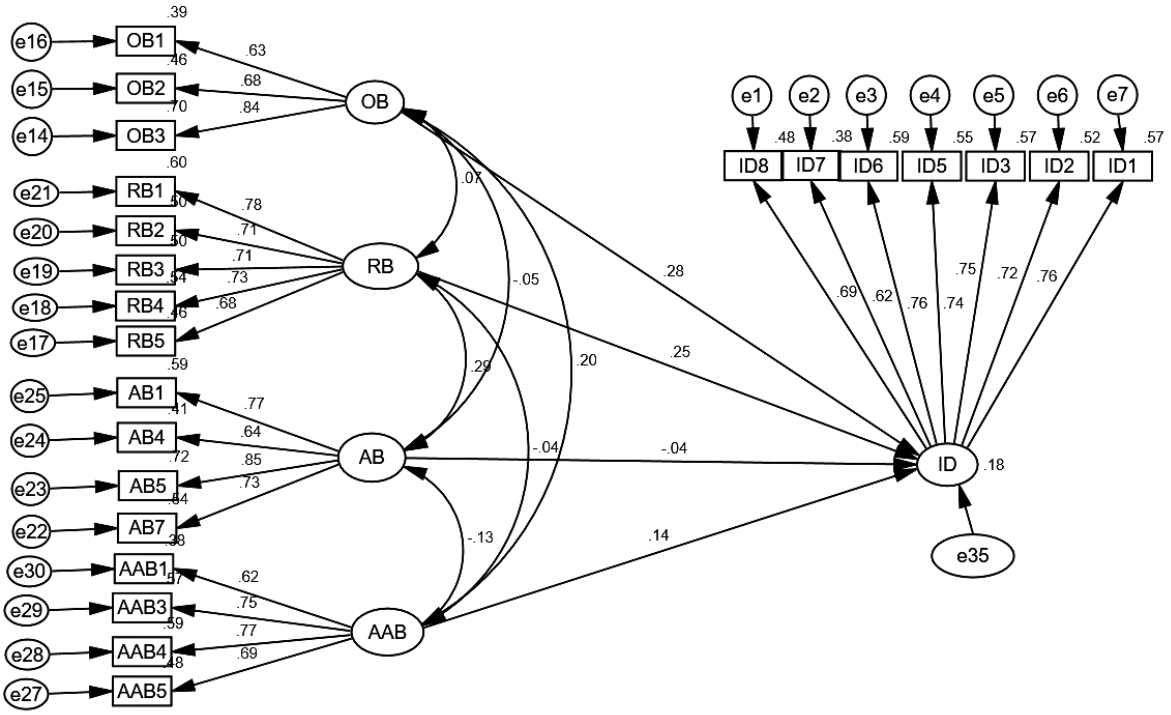

Figure 2. Structural model of heuristics and investment decision

This means that when overconfidence (OB) bias increased by 1 unit, the investment decision quality increased by 0.281 units.

Simultaneously, RB positively and significantly influenced ID ($\beta = 0.254$, $p < 0.01$). Nevertheless, the AB negatively and insignificantly affects ID ($\beta = -0.04$, $p > 0.01$). Similarly, the result indicates that the AAB positively and significantly affects ID ($\beta = 0.141$, $p < 0.01$). In sum, among exogenous constructs, OB is the prominent variable that influences the investment decisions of individual investors at the Nepal Stock Exchange (NEPSE).

Figure 3 indicates the low correlation among constructs, which means that there is no multicol-

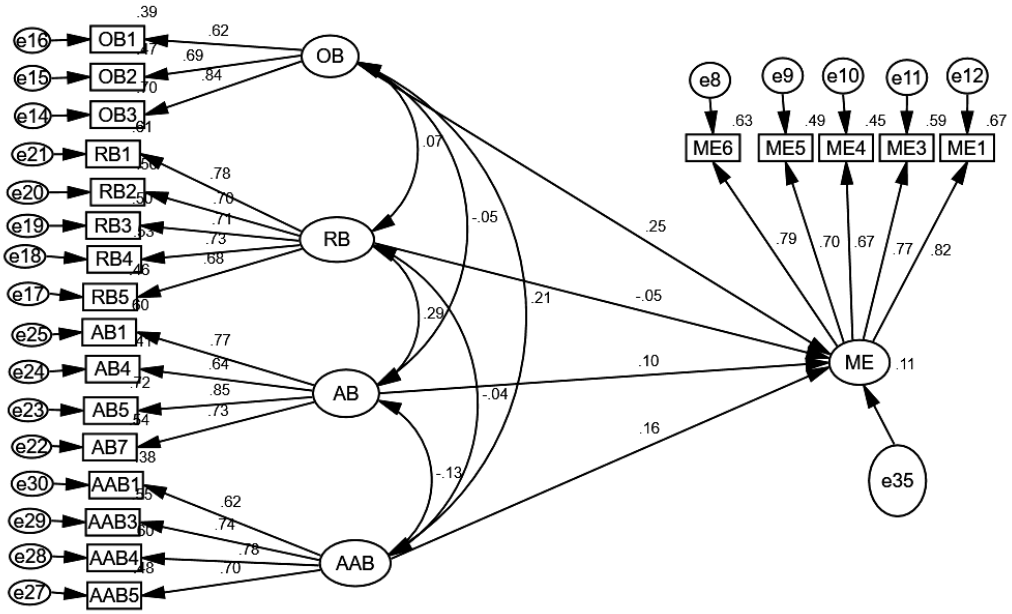

Figure 3. Structural model of determinants of heuristics and market efficiency

Table 5. Structural path coefficient of determinants of heuristics on market efficiency

Hypothesis	Path Name			Standardized Estimate	P-value	Results
H2a	ME	←	OB	0.253	***	Supported
H2b	ME	←	RB	–0.053	0.372	Not supported
H2c	ME	←	AB	0.101	0.091	Not supported
H2d	ME	←	AAB	0.163	***	Supported

Note: p*** means 1 percent significance level (two tails).

linearity problem in the model. Moreover, the coefficient of determination shows that the determinants of heuristics can interpret an 11 percent variance in market efficiency. Moreover, all 21 observed variables were significant at a 1 percent significance level, revealing that no measurement error occurred in the model and that all observed variables perfectly predicted their latent construct.

Table 5 shows that OB positively and significantly affects ME ($\beta = 0.253$, $p < 0.01$). This means that when OB increases by 1 unit, the quality of perceived market efficiency increases by 0.253 units. Similarly, AAB has a significant positive influence on ME ($\beta = 0.163$, $p < 0.01$). However, RB ($\beta = -0.05$, $p > 0.05$) and AB ($\beta = 0.10$, $p > 0.05$) indicate that these are insignificant predictors of ME. In sum, among four exogenous constructs, OB and AAB are the most important variables influencing market efficiency.

3.3. Mediating effect of market efficiency

The mediating role of the market efficiency (ME) between heuristics and investment decisions was examined using the bootstrapping method with bias-corrected confidence estimates (Hayes & Preacher, 2008). Initially, the relationship between the heuristics and the investment decision was assessed without including the ME to establish a significant direct relationship (Hooper et al., 2008). If this relationship was significant, the analysis proceeded to include the ME, evaluating the direct, indirect, and total effects using 5,000 bootstrapped resamples to estimate the indirect effect with a 95% confidence interval. The type of mediation was then determined: partial mediation was indicated if the direct effect remained significant, while complete mediation was indicated if the direct effect became non-significant when the mediating variable was included. Table 6 indicates that determinants of heuristics significantly affect ID and ME. The direct effect of ME has a positive and significant effect on ID ($\beta = 0.15$, $p < 0.01$). Therefore, *H3* is supported.

The result indicates that in the absence of ME, OB has a positive and significant effect on ID ($\beta = 0.31$, $p < 0.01$). However, the insignificant standardized indirect effect ($\beta = 0.02$, $p > 0.05$) shows no mediating role of ME in the relationship between OB and ID. Therefore, *H4a* is not supported. RB has a positive and significant effect on ID ($\beta = 0.16$, $p < 0.01$). However, insignificant standardized indirect effect ($\beta = -0.001$, $p > 0.05$) reveals no mediating role of ME.

Table 6. Mediation analysis results

Hypothesis	Path			Direct effect	Indirect effect	95% CI		Results
						Lower	Upper	
	OB	→	ME	0.28***	0.00	0.00	0.00	No mediation
H4a	ME	→	ID	0.07	0.00	0.00	0.00	
	OB	→	ID	0.31***	0.02	–0.01	0.05	
	RB	→	ME	–0.01	0.00	0.00	0.00	No mediation
H4b	ME	→	ID	0.258**	0.00	0.00	0.00	
	RB	→	ID	0.16***	0.00	–0.02	0.02	
H4d	AAB	→	ME	0.203***	0.00	0.00	0.00	Mediation
	ME	→	ID	0.122**	0.00	0.00	0.00	
	AAB	→	ID	0.162**	0.025**	0.00	0.06	

Note: *** means $p < 0.01$, ** means $p < 0.05$.

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Therefore, *H4b* is not supported. AAB positively and significantly affects ID ($\beta = 0.162$, $p < 0.05$). In the presence of ME, both the direct and indirect effects are statistically significant. . The significant standardized indirect effect ($\beta = 0.03$, $p < 0.05$) reveals a mediating effect. Again, in the presence of ME, there is a substantial relationship between AAB and ID, which indicates a case of partial mediation. Therefore, *H4d* is supported. AB has a positive but insignificant effect on ID ($\beta = 0.01$, $p>0.05$). Therefore, *H4c* is not supported.

4. DISCUSSION

Understanding the psychological factors influencing investor behavior is crucial for developing robust financial markets, especially in developing economies. Heuristic biases, which are mental shortcuts investors use to make decisions, can significantly impact investment choices and perceived market efficiency. This study tested three sets of hypotheses. Firstly, the impact of independent variables on dependent variables was evaluated, and results indicated that overconfidence bias, representativeness bias, and adjustments and anchoring bias significantly and positively influence investment decisions. These findings broadly support other studies (Bakar and Yi, 2016; Shah et al., 2012; Shah, Ahmad, and Mahmood, 2018), suggesting that overconfident investors who rely on patterns and initial anchors are more likely to engage in trading activities, believing in their ability to outperform the market. However, contrary to most existing literature, availability bias negatively affects investment decisions and does not significantly affect market efficiency. This indicates that readily available information from various sources can influence investor decisions, potentially leading to inappropriate investment choices and resulting in missed gains, ultimately reducing market efficiency.

Secondly, the analysis of independent variables and moderating variables reveals that overconfidence, and adjustment and anchoring bias are significant predictors of market efficiency, suggesting that heightened confidence among traders can enhance market activity and liquidity, thus improving efficiency. Adequate information allows better decision-making, leading to more accurate security pricing. Shah et al. (2012) also found that overconfident investors tend to perceive the market as more efficient. On the other hand, representative and anchoring biases did not emerge as significant predictors of market efficiency. This suggests that their impact on market efficiency may be minimal or dependent on specific contexts. These results emphasize the crucial influence of trader psychology and information availability in attaining market efficiency while also indicating that other biases may not directly affect the market's overall performance. Thus, in small emerging capital markets like Nepal, where individual investors dominate and a few investors can influence market trends, overconfidence is crucial in enhancing investment decisions and market efficiency.

Finally, the mediating role of market efficiency was tested using the bootstrapping method, which revealed mixed results. While market efficiency itself has a positive and significant direct effect on investment decisions, its role as a mediator varies among different biases. For overconfidence, the absence of a significant indirect effect indicates that market efficiency does not mediate this relationship, suggesting a direct pathway of influence. Similarly, for representative bias, the insignificant indirect effect shows no mediating role of market efficiency, emphasizing only direct relationships. Conversely, for adjustment and anchoring bias, the significant indirect effect supports the mediating role of market efficiency, indicating partial mediation. This suggests that while adjustment and anchoring bias directly influence investment decisions, part of this influence is channeled through perceptions of market efficiency, highlighting the complex interaction between heuristic adjustments and market perceptions. Therefore, this study highlights the significant role of heuristic biases in influencing investment decisions and perceived market efficiency in the NEPSE. Overconfidence and representativeness biases emerge as prominent factors, while the mediating role of market efficiency varies among different biases. These insights provide a foundation for developing strategies to improve investor behavior and market outcomes in developing economies.

CONCLUSION

This paper has explored how heuristics influence investment decisions among individual active investors in the Nepalese stock market, focusing on the mediating role of perceived market efficiency. The findings reveal that heuristic biases significantly impact investment choices, and market efficiency partially mediates the relationship between anchoring and adjustment heuristics and investment decisions. This partial mediation suggests that enhancing market efficiency can improve investment quality by leveraging learned skills. Consequently, individual investors should be cautious in selecting reliable information sources to make informed decisions. Therefore, regulatory bodies should make efforts to enhance market transparency and reliability, thereby mitigating the influence of biases and fostering a favorable investment environment. Future research should broaden the participant scope to include institutional investors, providing a more comprehensive understanding of investor behavior in the Nepalese stock market.

AUTHOR CONTRIBUTIONS

Conceptualization: Durga Datt Pathak, Bharat Singh Thapa.
Data curation: Durga Datt Pathak.
Formal analysis: Durga Datt Pathak.
Investigation: Durga Datt Pathak.
Methodology: Durga Datt Pathak.
Project administration: Bharat Singh Thapa.
Software: Durga Datt Pathak.
Supervision: Bharat Singh Thapa.
Validation: Durga Datt Pathak.
Visualization: Durga Datt Pathak, Bharat Singh Thapa.
Writing – original draft: Durga Datt Pathak.
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APPENDIX A

QUESTIONNAIRE SURVEY

Dear investor,

We cordially invite you to take part in our research on "BEYOND MARKET ANOMALIES: HOW HEURISTICS AND PERCEIVED EFFICIENCY SHAPE INVESTOR BEHAVIOR IN A DEVELOPING MARKET". Your participation in this research project is entirely voluntary. The findings will not identify individuals, and all the information obtained during the survey will be used only in the aggregated form in compliance with research ethics. Therefore, we would be grateful if you could spare a moment of your valuable time to complete the following questionnaire.

Thanking you for your cooperation.

Authors

Please tick the appropriate bracket

Gender	Male ☐ Female ☐ Others ☐
Age in years	30 and below ☐ 31-40 ☐) 41-50 ☐ Over 50 ☐
Marital status	Married ☐ Single ☐ Divorced ☐ Widow ☐
Education level	High school and lower ☐ Bachelor ☐ Master ☐ Ph.D. ☐
How long have you attended the stock market?	Under 1 year ☐ 1 to 3 years ☐ 3 to 5 years ☐ 5 to 10 years ☐ Over 10 years ☐

Below are several statements about you. Please indicate whether you agree or disagree with the statements by placing a tick (√) in the box, which best reflects your opinion.

Code	Items	Extremely disagree	Highly disagree	Somewhat disagree	Somewhat agree	Highly agree	Extremely agree
		1	2	3	4	5	6
ID1	I believe that high historical returns may lead to high future returns, so I often buy shares with good past prices.	1	2	3	4	5	6
ID2	When I buy shares, I usually hold them for a period of more than one month before selling.	1	2	3	4	5	6
ID3	I usually buy shares that I believe are priced below their true prices so that I can make a gain when their price goes up.	1	2	3	4	5	6
ID4	I usually buy shares that are ignored by other investors.	1	2	3	4	5	6
ID5	I prefer buying shares of companies with a high earnings growth rate.	1	2	3	4	5	6
ID6	I understand all the fundamentals of the company and I am confident in making my investments.	1	2	3	4	5	6
ID7	I am willing to take high risk in exchange for high-expected share returns.	1	2	3	4	5	6
ID8	The previous profits generated from similar investments by the company made it very attractive to me to invest in it.	1	2	3	4	5	6
ME1	You carefully consider the price changes of stocks you intend to invest in.	1	2	3	4	5	6
ME2	You have an over-reaction to price changes of stocks.	1	2	3	4	5	6
ME3	Market information is important for your stock investment.	1	2	3	4	5	6
ME4	You put the past trends of stocks under your consideration for your investment.	1	2	3	4	5	6
ME5	You analyze the companies' customer preferences before you invest in their stocks.	1	2	3	4	5	6
ME6	You study the market fundamentals of underlying stocks before making investment decisions.	1	2	3	4	5	6
OB1	You believe that your skills and knowledge of the stock market can help you to outperform the market.	1	2	3	4	5	6
OB2	You are normally able to anticipate the end of good or poor market returns at the NEPSE.	1	2	3	4	5	6
OB3	You are confident in your ability to do better than others in picking stocks.	1	2	3	4	5	6
OB4	You have a better investment record compared to others.	1	2	3	4	5	6
OB5	You are actively involved in trade activity.	1	2	3	4	5	6
OB6	You make an investment to make money quickly.	1	2	3	4	5	6

RB1	You buy 'hot' stocks and avoid stocks that have performed poorly in the recent past.	1	2	3	4	5	6
RB2	You use trend analysis of some representative stocks to make investment decisions for all stocks that you invest in.	1	2	3	4	5	6
RB3	I try to avoid investing in companies with a history of poor earnings.	1	2	3	4	5	6
RB4	I rely on past performance to buy stocks because I believe that good performance will continue.	1	2	3	4	5	6
RB5	Good stocks are firms with past consistent earnings growth.	1	2	3	4	5	6
AB1	If a friend advised me to purchase a stock of a certain company, then news arrived to me about the probability of that stock's price rising, I would invest in these stocks.	1	2	3	4	5	6
AB2	If I want to invest in the stocks of a certain company, I will rely on information from financial experts.	1	2	3	4	5	6
AB3	If I want to invest in the stocks of a certain company, I will rely on information from the internet.	1	2	3	4	5	6
AB4	If I want to invest in the stocks of a certain company, I will rely on my coworkers' opinions.	1	2	3	4	5	6
AB5	If I heard from a friend about a stock that achieved high returns, I would buy it.	1	2	3	4	5	6
AB6	If I want to invest in the stocks of a certain company, I will rely on information from the same company.	1	2	3	4	5	6
AB7	You consider the information from your close friends and relatives as a reliable reference for your investment decisions.	1	2	3	4	5	6
AAB1	I am likely to sell my stock after the price hits a recent year high.	1	2	3	4	5	6
AAB2	I believe that the position of the year high and low price determined the current stock price movement range.	1	2	3	4	5	6
AAB3	You rely on your previous experiences in the market for your next investment.	1	2	3	4	5	6
AAB4	You forecast the changes in stock prices in the future based on the recent stock prices.	1	2	3	4	5	6
AAB5	I compare the current stock prices with their recent high and low prices to justify my stock purchase.	1	2	3	4	5	6
AAB6	I use the stock purchase price as a reference point for trade.	1	2	3	4	5	6

Thank you for your participation!

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