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THE INFLUENCE OF BEHAVIORAL BIASES ON INVESTMENT DECISION-MAKING AMONG INVESTORS IN SABAH

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ABSTRACT

*Retail investor participation in Sabah has increased considerably among Baby Boomers, Generation X, and Millennials, reflecting growing interest in financial markets and investment opportunities. As more individuals engage in investment activities, understanding the behavioural factors that influence investment decision-making becomes increasingly important. Investment decisions are often made under conditions of uncertainty, where cognitive and emotional biases may affect investors' judgments and actions. Although behavioural finance has received substantial scholarly attention, empirical evidence examining behavioural biases among investors in Sabah remains limited. Furthermore, there is a need for greater understanding of how key behavioural biases influence investment decision-making within the Sabah context. This study investigates the influence of three behavioural biases, namely loss aversion bias, overconfidence bias, and herding bias, on investment decision-making among investors in Sabah. Guided by Prospect Theory, the study examines how these behavioural tendencies shape investors' decisions in financial markets. Data were collected through an online survey using purposive and snowball sampling techniques. A total of 160 valid responses were obtained from retail investors in Sabah, exceeding the minimum sample size of 138 recommended by G*Power. The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS 4.1.1.6. The findings provide empirical evidence on the role of behavioural biases in influencing investment decision-making among investors in Sabah. The study contributes to the behavioural finance literature by extending the understanding of investor behaviour in a regional Malaysian context. The findings also offer practical implications for investors, financial educators, policymakers, and market practitioners by highlighting the importance of behavioural awareness in improving investment decision quality and supporting more informed investment decisions.*

INTRODUCTION

Environmental, Social and Governance (ESG) Prior studies have identified several behavioural drivers of investment decision-making, including loss aversion, overconfidence, and herding behaviour. These behavioural biases have been widely examined in behavioural finance literature and have been shown to influence investor judgement and decision outcomes under uncertainty (Yanti & Endri, 2024; Hashim et al., 2026). However, empirical evidence remains limited within the Sabah context, despite the state's growing participation in financial markets and increasing accessibility to investment platforms. Sabah possesses distinct demographic, socioeconomic, and geographical characteristics that may shape investor behaviour differently from other regions in Malaysia. Therefore, further investigation is needed to understand how behavioural biases influence investment decision-making among investors in Sabah. This study addresses this gap by examining the direct effects of loss aversion bias, overconfidence bias, and herding bias on investment decision-making among retail investors in Sabah. The findings contribute to the behavioural finance literature by providing context-specific evidence from Sabah and offering insights for policymakers, financial institutions, and investors seeking to promote more informed investment decisions.

PROBLEM STATEMENT

Investment participation among retail investors in Sabah remains relatively low despite the growing availability of financial products and digital trading platforms. According to Bursa Malaysia (2024), only approximately 30,000 individuals in Sabah hold Central Depository System (CDS) accounts, representing about 1% of the state's population. This participation rate suggests a substantial gap between the availability of investment opportunities and actual market involvement. As financial markets become increasingly accessible, investors are exposed to a greater volume of information, market volatility, and uncertainty, which may complicate investment decision-making. Under such conditions, investment decisions are not always driven by rational evaluation but may be influenced by psychological and behavioural factors that affect judgement and decision outcomes.

Behavioural finance literature suggests that investors are susceptible to behavioural biases such as loss aversion, overconfidence, and herding, which can influence investment decision-making under uncertainty (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992). Although these behavioural biases have been extensively examined in different countries and financial contexts, empirical evidence focusing specifically on investors in Sabah remains limited. Existing studies largely concentrate on broader Malaysian samples or other geographical settings, providing limited understanding of investor behaviour within Sabah's unique demographic and socioeconomic environment. Given Sabah's relatively low participation in capital markets and the scarcity of context-specific empirical evidence, further investigation is needed to examine how behavioural biases influence investment decision-making among investors in Sabah. Addressing this gap is important for improving the understanding of investor behaviour and for supporting the development of policies, financial education initiatives, and investment strategies that encourage more informed investment decisions among Sabah investors.

RESEARCH OBJECTIVE

The main objective of this study is to examine the influence of behavioural biases on investment decision-making among investors in Sabah. Specifically, the study aims to:

RO1: To examine the influence of loss aversion bias on investment decision-making among investors in Sabah.

RO2: To examine the influence of overconfidence bias on investment decision-making among investors in Sabah.

RO3: To examine the influence of herding bias on investment decision-making among investors in Sabah.

LITERATURE REVIEW

Prospect Theory

Prospect Theory explains decision-making under uncertainty through reference dependence and asymmetric evaluation of gains and losses. Loss aversion leads investors to overweight potential losses, which shapes cautious or delayed decisions. At the same time, overconfidence distorts judgment by inflating belief in one's knowledge and control, often reducing sensitivity to risk. These mechanisms influence how investors process uncertainty and form risk perception as a cognitive filter for decision-making.

Empirical evidence shows consistent effects of loss aversion on conservative behaviour and disposition patterns, while overconfidence often drives excessive trading and risk-taking. However, findings remain mixed across contexts, particularly across investor groups and market conditions. Some studies report weak or insignificant effects,

suggesting that behavioural biases do not translate uniformly into decision outcomes. This inconsistency indicates that underlying cognitive mechanisms, such as risk perception, play a critical role in shaping the final decision.

Social Learning Theory

Social Learning Theory explains behaviour through observational learning and interaction. In financial markets, this process manifests as herding, where investors rely on the actions of others when facing uncertainty. Herding reflects the use of social information as a shortcut to interpret complex market signals.

Empirical findings show that herding intensifies under uncertainty and can lead to correlated trading behaviour. However, its effect on decision-making is inconsistent. Some evidence links herding to reduced decision quality, while other findings suggest it may improve decisions when collective information is informative. These mixed results indicate that herding operates through perceptual mechanisms rather than direct behavioural effects alone.

Conceptual Framework

The conceptual framework in Figure 1, developed for this study, examines the direct effects of three behavioural biases, namely loss aversion bias, overconfidence bias, and herding bias, on investment decision-making among investors in Sabah. The dependent variable in this study is investment decision-making. Grounded in behavioural finance theory, particularly Prospect Theory and Social Learning Theory, the framework proposes that behavioural biases influence how investors evaluate financial information, perceive investment risk, and make investment-related decisions. Collectively, these behavioural biases are expected to influence the rationality and quality of investment decision-making among retail investors in Sabah (Kahneman & Tversky, 1979; Barber & Odean, 2001; Banerjee, 1992).

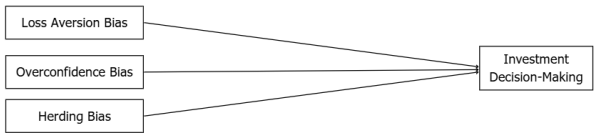

Figure 1: Conceptual Framework

Hypotheses Development

Behavioural biases shape investment decisions through both direct and indirect pathways. Loss aversion is expected to reduce investment engagement due to heightened sensitivity to losses. Overconfidence is expected to increase participation but may lead to suboptimal decisions due to underestimated risk. Herding is expected to influence decisions through reliance on social cues, particularly under uncertainty.

H1: Loss aversion bias significantly influences investment decision-making among investors in Sabah.

H2: Overconfidence bias significantly influences investment decision-making among investors in Sabah.

H3: Herding bias significantly influences investment decision-making among investors in Sabah.

METHODOLOGY

This study adopted a positivist research philosophy and employed a quantitative cross-sectional survey design. The target population consisted of retail investors in Sabah, particularly those residing in Kota Kinabalu, Sandakan, and Tawau. Data were collected using a structured questionnaire administered through Google Forms and distributed via social media platforms, investment-related groups, and investor networks. Given the absence of a comprehensive sampling frame for retail investors in Sabah, non-probability purposive and snowball sampling techniques were employed. Based on G*Power analysis, the minimum required sample size was 138 respondents. A total of 160 valid responses were obtained and used for the final analysis.

All constructs were measured using established multi-item scales adapted from prior studies and assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The study examined four constructs, namely investment decision-making, loss aversion bias, overconfidence bias, and herding bias. In this study, investment decision-making refers to the extent to which investors actively engage in the investment decision-making process, including information evaluation, investment planning, and decision execution, rather than the quality or success of the investment outcomes. Data screening procedures included the assessment of missing values, response inconsistencies, outliers, and multivariate normality. As the data did not satisfy normality assumptions, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed using SmartPLS 4.1.1.6, while SPSS was used for preliminary data analysis. PLS-SEM was considered appropriate due to its suitability for examining complex predictive relationships and its robustness in handling non-normally distributed data. The significance of the structural relationships was evaluated using the bootstrapping procedure with a significance level of 0.05.

FINDINGS

Common Method Variance

As the data were collected from a single source using a self-administered questionnaire, Common Method Variance (CMV) was assessed using several statistical procedures. Harman's single-factor test showed that the largest factor accounted for 34.28% of the total variance, which is below the recommended 50% threshold (Podsakoff et al., 2003). A full collinearity assessment further indicated that all Variance Inflation Factor (VIF) values ranged from 1.201 to 3.189, below the critical value of 3.3 (Kock & Lynn, 2012). In addition, the marker-variable technique revealed only negligible changes in the structural model, with path coefficient differences ranging from 0.000 to 0.030 and R^2 changes ranging from 0.000 to 0.010. Collectively, these results suggest that CMV was not a significant concern in this study.

Table 1. Harman Single-Factor Factor Test

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.312	34.279	34.279	11.312	34.279	34.279
2	3.471	10.518	44.796			
3	2.487	7.537	52.333			
4	1.765	5.348	57.681			
5	1.615	4.893	62.574			
6	1.221	3.699	66.272			
7	1.102	3.341	69.613			
8	1.014	3.074	72.687			
9	.878	2.660	75.347			
10	.774	2.347	77.693			
11	.708	2.144	79.838			
12	.682	2.068	81.906			
13	.609	1.846	83.751			
14	.551	1.671	85.422			
15	.492	1.491	86.913			
16	.465	1.410	88.323			
17	.419	1.269	89.591			
18	.411	1.246	90.838			
19	.371	1.124	91.962			
20	.336	1.018	92.979			
21	.300	.908	93.887			
22	.281	.851	94.738			
23	.264	.800	95.538			
24	.237	.719	96.257			
25	.220	.667	96.924			
26	.211	.639	97.563			
27	.167	.507	98.071			
28	.147	.446	98.516			
29	.129	.391	98.907			
30	.111	.338	99.245			
31	.089	.269	99.514			
32	.082	.249	99.763			
33	.078	.237	100.000			

Extraction Method: Principal Component Analysis.

Table 2 Full Collinearity

Table 2 Full Collinearity

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.537	.025		21.674	<.001		
	Financial Literacy	-.040	.036	-.134	-1.096	.275	.386	2.593
	Herding Bias	.045	.030	.152	1.511	.133	.570	1.755
	Investment Decision-Making	-.004	.040	-.014	-.107	.915	.314	3.189
	Loss Aversion Bias	-.010	.027	-.035	-.383	.702	.692	1.444
	Overconfidence Bias	-.006	.029	-.020	-.204	.839	.607	1.647
	Risk Perception	-.001	.035	-.002	-.019	.984	.402	2.485
	Financial Literacy x Risk Perception	-.042	.020	-.173	-2.072	.040	.833	1.201

a. Dependent Variable: Random

Respondent Profile

The final sample comprised 160 respondents and was relatively balanced by gender, with 53.75% male and 46.25% female. The sample was concentrated in the 29 to 44 age group (54.37%), with Kota Kinabalu contributing the largest share (41.25%), followed by Sandakan (31.87%) and Tawau (26.88%). Most respondents held a bachelor's degree (45.62%), worked in the private sector (41.88%), and reported income of RM5,249 and below (64.38%). Investment experience was generally limited, with 45.00% reporting two years or less, and monthly investing was the dominant pattern (52.50%).

Table 4.1 Demographic Profile

Demographic	Categories	Total (n)	Percentage (%)
Gender	Male	86	53.75
	Female	74	46.25
Age	29–44 years old	87	54.37
	45–59 years old	51	31.87
	60–79 years old	22	13.75
District of residence	Kota Kinabalu	66	41.25
	Sandakan	51	31.87
	Tawau	43	26.88
Academic qualifications	Bachelor's Degree	73	45.62
	Master's Degree	21	13.12
	SPM	21	13.12
	Doctoral Degree (PhD/DBA)	20	12.5
	STPM/Diploma/Matriculation	19	11.88
	Others	4	2.50
	Professional Qualifications	2	1.25
Employment	Private Sector	67	41.88
	Public Sector	48	30.00
	Self-Employed	32	20.00
	Unemployed	7	4.38
	Retirement Benefits	6	3.75
Income level	RM 5,249 and below	103	64.38
	RM 5,250 – RM 11,819	46	28.75
	RM 11,820 and above	11	6.88
Investment experience	2 years and below	72	45.00
	2–5 years	46	28.75
	5–10 years	21	13.12
	10 years and above	21	13.12
Investment frequency	Monthly	84	52.50
	Occasionally	69	43.12
	Daily	5	3.12
	Weekly	2	1.25

Measurement Model Assessment

The measurement model demonstrated acceptable quality. Outer loadings ranged from 0.529 to 0.896 after deleting LAB4 and RP6 due to low loadings. Cronbach's alpha ranged from 0.797 to 0.879, composite reliability ranged from 0.862 to 0.909, and AVE ranged from 0.559 to 0.669, supporting internal consistency and convergent validity. Discriminant validity was also adequate, as all HTMT values were below 0.85 and all bootstrapped confidence intervals remained below 1.00. Collinearity was not a concern, with VIF values ranging from 1.257 to 2.194.

Structural Model Assessment

The direct effects on investment decision-making were mixed. Loss aversion did not predict investment decision-making (β = -0.005, p = 0.940), and overconfidence was also non-significant (β = -0.038, p = 0.545). Herding showed a positive and significant effect (β = 0.143, p = 0.023), but the direction was opposite to the hypothesised relationship and therefore remained unsupported. In contrast, all three behavioural biases significantly predicted risk perception, namely loss aversion (β = 0.299, $p < 0.001$), overconfidence (β = 0.249, $p < 0.001$), and herding (β = 0.332, $p < 0.001$), while risk perception significantly predicted investment decision-making (β = 0.302, $p < 0.001$). Effect sizes were small to modest, with the largest effects observed for herding on risk perception (f2 =

0.142), risk perception on investment decision-making (f2 = 0.133), and loss aversion on risk perception (f2 = 0.132).

CONCLUSION

Discussion

Overconfidence was also not significantly associated with investment decision-making. In this context, self-reported overconfidence may reflect perceived competence rather than observable miscalibration, which may explain the mixed findings reported across different settings and measurement approaches. Herding demonstrated a significant positive association with investment decision-making, although the relationship was opposite to the hypothesised direction. This finding does not indicate superior decision quality. Rather, it suggests that investors who place greater attention on the actions and opinions of others tend to report higher levels of engagement in investment decision-making activities. From the perspective of Social Learning Theory, individuals learn and adapt their behaviour by observing others, particularly in situations characterised by uncertainty and limited information. In the investment context, observing the behaviour of other investors may serve as a source of information and reassurance, which is associated with greater participation in evaluating, planning, and executing investment decisions. Nevertheless, the magnitude of the relationship was relatively small, suggesting that herding represents only one of several factors associated with investment decision-making among investors in Sabah.

Thus, the findings suggest that not all behavioural biases are equally associated with investment decision-making among investors in Sabah. While loss aversion and overconfidence were not significantly associated with investment decision-making, herding emerged as the only behavioural bias exhibiting a significant positive association. These findings contribute context-specific evidence to the behavioural finance literature and highlight the importance of understanding investor behaviour within Sabah's unique investment environment.

Implications

The findings suggest that behavioural biases are not equally associated with investment decision-making among retail investors in Sabah. Consistent with Prospect Theory and Social Learning Theory, investment decision-making appears to be associated with both cognitive evaluations and social influences. The positive association between herding and investment decision-making suggests that investors who rely more on social information tend to report higher engagement in investment-related activities.

Methodologically, the findings indicate that self-reported investment decision-making measures may capture investor engagement in the decision-making process rather than investment performance or decision quality. This distinction is important when interpreting behavioural finance findings.

From a practical perspective, the results highlight the need for investor education initiatives in Sabah, particularly in Kota Kinabalu, Sandakan, and Tawau. Financial institutions and regulators may strengthen programmes that enhance investors' ability to evaluate investment information, understand market risks, and critically assess information obtained from social networks and online investment communities.

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