BEHAVIOURAL BIAS AND INVESTMENT DECISIONS OF PENSION FUND ADMINISTRATORS IN NIGERIA: THE MEDIATING EFFECT OF RISK TOLERANCE

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Abstract

Investment decision-making is critical in financial management due to its impact on resource allocation, profitability, and organizational growth. However, such decisions, especially within institutional settings like Pension Fund Administrators (PFAs) in Nigeria, are often influenced by behavioural biases. This study investigates the effects of both cognitive and emotional biases—including regret-aversion, status quo bias, self-control bias, representative bias, disposition effect, self-attribution bias, and herding—on PFAs' investment decisions. It also examines the mediating role of risk tolerance in these relationships. Using a survey research design, data were collected from licensed Nigerian PFAs and analyzed through Structural Equation Modeling (SEM). The findings indicate that disposition effect, herding, regret aversion, representative bias, and status quo bias significantly affect investment decisions. In contrast, self-attribution and self-control biases showed no significant influence. Furthermore, risk tolerance significantly mediated the effects of disposition effect, regret aversion, self-attribution, and status quo bias, but not herding, self-control, or representative bias. The study highlights risk tolerance as a key factor in moderating behavioural bias impacts, showing that PFAs with higher risk tolerance make more rational and adaptive investment decisions. It contributes to behavioural finance literature by applying prospect and disappointment theories in institutional contexts. The practical implications suggest PFAs implement training, structured decision-making frameworks, and regulatory oversight to counteract bias. These insights are valuable for policymakers and financial practitioners seeking to enhance the performance and stability of Nigeria's pension fund sector.

Keywords: Bias, Cognitive, Emotional, Investment, Pension Fund Administrator.

Introduction:

Investment decisions are central to corporate financial management, shaping profitability, growth, and long-term success. Although traditional finance theories presume rational decision-making, behavioural finance reveals that both individual and institutional investors, including Pension Fund Administrators (PFAs), often act irrationally due to emotional and cognitive biases (Weixiang & Rui, 2022; Wikartika et al., 2023). Behavioural finance, anchored in prospect theory and heuristics, explains how these biases distort judgment under risk and uncertainty (Kahneman & Tversky, 1979; Shefrin & Statman, 1985).

Despite their expected professionalism, PFAs in Nigeria are not immune to such biases. They managed assets that rose from ₦16.11 trillion in May 2023 to ₦23.26 trillion by February 2025, yet poor investment decisions continue to undermine the financial wellbeing of retirees (Anaesoronye, 2024). The increasing shift toward riskier investments like equities and real estate amid inflation, forex volatility, and economic instability raises concerns about bias-influenced decision-making.

This study identifies risk tolerance as a mediating factor that could mitigate or exacerbate the influence of behavioural biases on investment decisions. Investors with higher risk tolerance may better handle market uncertainties, while those with lower tolerance may react emotionally. Although previous studies have explored behavioural biases, few have focused on institutional investors like PFAs, particularly within Nigeria. Furthermore, the mediating role

of risk tolerance remains underexplored, leaving a gap in understanding how it influences bias-driven investment outcomes (Pension Nigeria, 2023; Adebayo, 2023; Tella, 2023).

The Nigerian economic context—marked by inflation, currency instability, and frequent policy changes (Aina, 2024; IMF, 2024)—exacerbates these issues (Afolabi & Erasmus, 2023). To address this gap, the study investigates the combined effects of seven behavioural biases on PFAs' investment decisions, with risk tolerance serving as a mediator, offering a context-specific framework for improved investment practices in Nigeria.

Review of Literature

provides a comprehensive examination of existing literature on investment decisions, behavioural biases, and the mediating role of risk tolerance. It introduces the theoretical foundations underpinning behavioural finance, contrasts it with traditional finance, and integrates relevant empirical findings to establish the research gap. The chapter culminates in the conceptual model guiding the study.

Conceptual Review

This part offers a conceptual examination of the main study-related constructs, elucidating their definitions and connections. It forms the basis of comprehending how risk tolerance and behavioral biases impact investment choices. They include: Investment, Behavioral Bias, and Risk Tolerance.

Investment: Investment involves the allocation of resources—typically money—with the expectation of future returns. Scholars like Wikartika et al. (2023) and Weixiang & Rui (2022) view investment as a rational economic activity aimed at value creation. However, it is increasingly evident that investors—both institutional and individual—are influenced by psychological factors such as mood, sentiment, and emotion. Investment decisions are crucial to firm growth, and inaccurate or emotionally-driven decisions may lead to suboptimal performance.

Behavioural Bias: Behavioural bias refers to systematic deviations from rational judgment due to emotional or cognitive limitations. It challenges the assumption of investor rationality in standard finance (Kahneman & Tversky, 1979). Behavioural finance incorporates insights from psychology and economics to explain why and how investors act irrationally. This study explores seven key behavioural biases, grouped into emotional (regret-aversion, status quo, self-control) and cognitive (representative, disposition, self-attribution, herding) categories. **Regret-Aversion Bias highlights that** Investors avoid decisions that might lead to future regret, often resulting in inaction or excessively conservative investments (Loomes & Sugden, 1982). **Status Quo Bias describe that** Investors prefer to maintain current investment choices to avoid perceived risks associated with change, even when change may offer better returns (Kipsaat & Olweny, 2020 and Mamidala et al. 2023). Similarly, **Self-Control Bias** occurs when investors fail to balance long-term goals with short-term temptations, often leading to over- or under-investment based on emotional impulses. These biases can be jointly classified as Emotional biases.

In contrast, **Cognitive Biases comprises of Representative Bias where** Investors assume that past trends will continue, leading them to incorrectly judge probabilities and outcomes. Shefrin and Statman (1985) were of the opinion that d**isposition Effect as a cognitive bias also describes** Investors tend to sell winning investments too early while holding on to losing ones, influenced by fear of realizing a loss. Similarly, **Self-Attribution Bias** involves crediting personal success to skill while blaming failures on external factors, reinforcing overconfidence. **Herding Bias also outlines how** Investors mimic the decisions of others without independent analysis, often driven by groupthink or fear of missing out (Bikhchandani & Sharma ,2000). Also Kartini and Nahda (2021) provided evidence on Herding Bias among institutional investors.

These biases arise from heuristics—mental shortcuts used to simplify decision-making in uncertain environments. Although they can be useful, heuristics often result in systematic errors in judgment, especially under stress, uncertainty, or emotional strain.

Risk Tolerance: Risk tolerance is the investor's ability and willingness to withstand losses in pursuit of future gains. It varies based on psychological, demographic, and contextual factors. In this study, risk tolerance serves as a **mediator**, potentially weakening or intensifying the influence of behavioural biases on investment decisions. Investors with higher risk tolerance may act more rationally, while those with low tolerance may make emotionally-driven decisions. **Key Indices Influencing Risk Tolerance is** Age, Income level, Investment experience, financial literacy and Personality traits such as openness or anxiety. Thus, understanding these indices is essential to interpret how different PFAs respond to the same bias differently, depending on their inherent or situational risk tolerance.

Research (e.g., Raheja & Dhiman, 2019; Soraya et al., 2023) shows that risk tolerance can mediate the relationship between behavioural biases and investment outcomes. Investors with higher tolerance are more likely to override biases and stick to strategic plans. In contrast, low-risk-tolerant investors often let emotion guide decisions. Ahmed et al. (2021) and Kasoga (2021) provide robust evidence that risk tolerance can significantly shape or even neutralize the effect of cognitive and emotional biases.

Theoretical Framework

Disappointment and Prospect Theory: Disappointment Theory explains how unmet expectations generate disappointment, leading to aversion to risky decisions in the future. Applied to investment, it suggests that past negative outcomes shape future behaviour through emotional responses rather than logical evaluation. Similarly, **Prospect Theory as a f**oundational theory of behavioural finance; posits that people value gains and losses differently, and thus make decisions based on perceived gains rather than actual outcomes. It introduces concepts like **loss aversion**, **reference dependence**, and **diminishing sensitivity**, all of which relate directly to the behavioural biases under study.

The study engages a conceptual model where seven behavioural biases (three emotional and four cognitive) influence PFAs' investment decisions, with **risk tolerance acting as a mediating variable**. This model not only extends existing theories but also introduces a **Nigerian institutional perspective** that has been largely underrepresented in behavioural finance literature.

Empirical Literature Review:

This synthesizes prior empirical findings on how specific biases influence investment behaviour, particularly in the context of institutional investors. Studies such as Sood et al. (2023) and Gabillon (2020) demonstrate that regret aversion can lead investors to avoid decisions altogether or opt for excessively safe investments. While impactful, many studies focus on retail or crypto investors, and there's a gap regarding institutional contexts like PFAs. On **Status Quo Bias; studies of** Mamidala et al. (2023) found that investors resist changes due to switching costs and fear of negative outcomes, leading to inertia in decision-making. Other research (e.g., Kipsaat & Olweny, 2020) supports its significant role in professional investment reluctance to rebalance portfolios. **Self-Control Bias has been** less explored in institutional finance. Limited studies suggest that self-control failures can result in impulse decisions or emotional attachment to poor-performing assets.

Empirical evidence on **Representative Bias shows that** Investors affected by this bias often generalize past performance to predict future outcomes. The result is overinvestment in currently trending or overvalued assets. Soraya et al. (2023) found that such biases are stronger in less regulated or volatile markets. **Disposition Effect** is well-documented, especially among inexperienced investors. Studies (e.g., Rau, 2015; Choe & Eom, 2009) show institutional investors are not exempt from this behaviour, particularly during economic downturns. **Self-Attribution Bias** builds overconfidence and reinforces flawed strategies, limited empirical studies have tested its influence among institutional investors. Naveed and Mohd (2021) suggest its significance increases with experience and organizational power. **Herding Bias is w**idely studied, and drives market bubbles and crashes. Studies (e.g., Jain et al., 2023; Kartini & Nahda, 2021) confirm that both retail and institutional investors often follow market trends instead of independent analysis, particularly under uncertainty.

Although behavioural finance has matured over the years, several gaps persist which are very limited studies integrate both emotional and cognitive biases in a unified model. Most studies examine direct relationships between biases and investment, ignoring the mediating role of variables like risk tolerance. There is also a limited focus on institutional investors, especially PFAs in Nigeria where contextual differences (economic volatility, regulation) can provide valid contribution to knowledge.

Thus the research model of this study poses fifteen research questions and objectives to explore the direct and mediating effects of behavioural biases. These questions address the extent to which each bias influences PFAs' investment decisions and whether risk tolerance mediates these relationships. Key questions include:

- How do regret-aversion, status quo, and self-control biases affect investment decisions?
- What is the impact of representative, disposition, self-attribution, and herding biases on investment decisions?
- To what extent does risk tolerance mediate the effect of each of these biases on PFAs' decisions?

Fifteen null hypotheses were formulated, corresponding to the research questions and objectives. These test whether each behavioural bias has a significant effect on PFAs' investment decisions and whether risk tolerance significantly mediates those effects.

Methodology and Results:

A quantitative research design was adopted, aimed at evaluating both direct and mediating relationships between emotional and cognitive biases, risk tolerance, and investment decisions. A cross-sectional survey was employed to collect standardized data at a single point in time, allowing for the testing of statistical relationships among the constructs. This approach is ideal for large-scale studies within a limited timeframe and budget. The study focused on the entire population of licensed Pension Fund Administrators (PFAs) in Nigeria. A total of 22 PFAs licensed by the National Pension Commission (PenCom) formed the population. From this, a purposive sampling method was applied to select relevant investment professionals within each PFA. Based on existing research and using Krejcie and Morgan's sample size formula, a sample of 110 respondents was determined to be adequate for structural equation modeling (SEM).

The study used a structured questionnaire, divided into five sections covering demographic data, emotional biases, cognitive biases, risk tolerance, and investment decisions. The questionnaire consisted of 39 items adapted from established scales and previous studies, all measured using a 7-point Likert scale, which enhances precision and reduces bias in responses.

A pilot study was conducted with a small subset of respondents to validate the instrument. Items with low factor loadings (< 0.60) were removed to enhance reliability and validity. The constructs were confirmed to have strong internal consistency and discriminant validity.

Preliminary data analysis included tests for missing values, outliers, normality, and multicollinearity using SPSS Version 22. The main analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.2. This technique is well-suited for examining complex relationships among latent constructs. In Hypothesis Testing, bootstrapping method (5,000 samples) was used to test significance. The measurement model evaluation included tests of reliability (Cronbach's Alpha and Composite Reliability), convergent validity (Average Variance Extracted), and discriminant validity (Fornell-Larcker Criterion, HTMT Ratio). Similalrly, the structural model evaluation assessed path coefficients, R^2 values (explained variance), f^2 effect sizes, and Q^2 (predictive relevance). The Importance-Performance Map Analysis (IPMA) was used to visualize the relative influence and performance of latent constructs on investment decision

Preliminary screening showed that missing values were less than 10% and was treated using mean substitution. Outliers were detected using Mahalanobis Distance; none were removed as all values were within acceptable thresholds. Normality was assessed using skewness and kurtosis; data conformed to the acceptable range (Skewness ±1.96, Kurtosis ≤7). For multicollinearity testing; all VIF values were below 5, indicating no multicollinearity issues.

In the measurement model evaluation reliability and validity test were carried out and all retained items had loadings above 0.70. On composite reliability all constructs exceeded the 0.70 benchmark. The AVE (Convergent Validity) ranged from 0.64 to 0.87—well above the 0.50 threshold while discriminant validity was confirmed using Fornell-Larcker and HTMT ratio methods.

For this investigation, a sample size of 110 respondents is suitable from a statistical and contextual standpoint. Based on Krejcie and Morgan's (1970) formula, the sample is appropriate for Nigeria's 22 licensed Pension Fund Administrators (PFAs). To ensure adequate

representation of people directly involved in investment decision-making, the study purposefully recruited investment experts inside each PFA rather than sampling organizations. The study's contextual validity was increased and non-representativeness issues were addressed by this purposive strategy, which also improved the replies' depth and relevance.

The sample size satisfies the methodological requirements for Partial Least Squares Structural Equation Modeling (PLS-SEM), which successfully manages complex models with fewer samples. The intricacy of this model warrants a sample of more than 80, which is significantly less than the 110 attained. Hair et al. (2021) states that a minimum of 10 times the maximum number of structural routes is an appropriate benchmark. Furthermore, this sample size guarantees more than 80% statistical power to identify medium effect sizes at a 5% significant level, according to a GPower analysis. The study used a validated instrument, carried out a pilot test, and made sure that all 22 PFAs were fully covered in order to further address potential bias, enhancing the validity and generalizability of the findings.

Table 4.1: Descriptive Statistics of Construct: Mean and Standard Deviation

Indicators	N	Mean	Std. Deviation
RAB	106	3.17	0.91
RB	106	3.47	0.77
SAB	106	3.54	0.80
SQB	106	3.57	0.79
SCB	106	3.57	0.73
DE	106	3.55	0.74
HB	106	3.45	0.80
RT	106	3.42	0.75
ID	106	3.73	0.77
Valid N (listwise)	106		

Source: Researcher's Study, 2025.

Table 4.2: Item Loadings, Internal Consistency, and Average Variance Extracted

Constructs	Indicators	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Disposition Effect	DE1	0.82	0.92	0.94	0.73
	DE2	0.82			
	DE3	0.87			
	DE4	0.88			
	DE5	0.89			
	DE6	0.82			
Herding Bias	HB1	0.87	0.92	0.94	0.75
	HB2	0.88			
	HB3	0.88			

	HB4	0.85			
	HB5	0.86			
Investment Decision	ID1	0.89	0.92	0.95	0.87
	ID2	0.95			
	ID3	0.95			
Regret Aversion Bias	RAB1	0.85	0.92	0.94	0.76
	RAB2	0.87			
	RAB3	0.91			
	RAB4	0.90			
	RAB5	0.83			
Representative Bias	RB1	0.88	0.83	0.90	0.75
	RB2	0.84			
	RB3	0.88			
Risk Tolerance	RT2	0.90	0.85	0.91	0.77
	RT3	0.89			
	RT5	0.83			
Self-Attribution Bias	SAB1	0.94	0.87	0.94	0.88
	SAB2	0.94			
Self-Control Bias	SCB1	0.90	0.90	0.93	0.76
	SCB2	0.87			
	SCB3	0.87			
	SCB4	0.86			
Status-Quo Bias	SQB1	0.92	0.89	0.93	0.82
	SQB2	0.93			
	SQB3	0.88			

Source: Researcher's Study, 2025

Table 4.3: Hypotheses Test

Relationship	Beta Values	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Disposition Effect -> Investment Decision	0.28	0.08	3.81	0.00
Herding Bias -> Investment Decision	0.15	0.05	2.90	0.00
Regret Aversion Bias -> Investment Decision	-0.09	0.04	2.32	0.02

Representative Bias -> Investment Decision	0.06	0.03	2.04	0.04
Risk Tolerance -> Investment Decision	0.23	0.05	4.66	0.00
Self-Attribution Bias -> Investment Decision	0.07	0.04	1.77	0.08
Self-Control Bias -> Investment Decision	0.09	0.06	1.54	0.12
Status-Quo Bias -> Investment Decision	0.14	0.06	2.42	0.02
Disposition Effect -> Risk Tolerance-> Investment Decision	0.09	0.03	3.33	0.00
Herding Bias -> Risk Tolerance-> Investment Decision	-0.01	0.01	1.00	0.32
Regret Aversion Bias-> Risk Tolerance -> Investment Decision	0.02	0.01	2.21	0.03
Representative Bias-> Risk Tolerance -> Investment Decision	0.01	0.01	1.67	0.09
Self-Attribution Bias -> Risk Tolerance-> Investment Decision	0.05	0.02	3.64	0.00
Self-Control Bias -> Risk Tolerance-> Investment Decision	0.02	0.01	1.30	0.20
Status-Quo Bias -> Risk Tolerance-> Investment Decision	0.04	0.02	2.33	0.02

Source: Researcher's Study, 2025

Discussion of Findings

The findings from this study offer compelling insights into how behavioural biases and risk tolerance jointly shape investment decisions among Nigerian Pension Fund Administrators (PFAs). For the direct Effects of Behavioural Biases; Disposition Effect emerged as the most influential bias, showing a strong positive effect on investment decisions. This confirms that PFAs tend to hold onto losing assets rather than realize losses, consistent with Shefrin and Statman (1985). This emotional attachment to past decisions leads to suboptimal portfolio performance. Herding Bias also had a significant positive impact. PFAs were shown to follow the crowd, reflecting a lack of independent analysis under uncertainty—a behaviour validated by studies such as Bikhchandani & Sharma (2000).

Regret Aversion Bias was significantly negatively associated with investment decisions, suggesting that PFAs avoid risky choices to escape potential regret. This conservative strategy, while emotionally protective, limits opportunities for higher returns, aligning with the views of Loomes and Sugden (1982). Status Quo Bias demonstrated a positive and significant effect. PFAs exhibited inertia, preferring familiar investment choices even when better alternatives exist, likely driven by a desire to avoid change-related risk. Representative Bias had a statistically significant but weak influence, indicating that PFAs sometimes generalize from past patterns or rely on stereotypes when assessing future outcomes. This behaviour introduces risk of misjudgment in volatile markets. In contrast, Self-Control Bias and Self-Attribution

Bias did not show significant direct effects on investment decisions, although self-attribution had a significant indirect effect through risk tolerance.

For the mediating relationship, Risk Tolerance had a direct and significant effect on investment decisions, reinforcing the idea that willingness to take risk influences strategy. Thus, Risk tolerance significantly mediated the relationships between Disposition Effect, Regret Aversion, Status Quo Bias, and Self-Attribution Bias with Investment Decision. However, it did not significantly mediate the relationships involving Herding, Representative Bias, or Self-Control Bias. This suggests that some biases are more emotionally rooted or externally driven, making them less dependent on individual risk profiles. The high R^2 value of 0.78 for risk tolerance highlights that behavioural biases substantially shape an investor's risk preferences, which in turn influence their decisions. This supports the psychological pathway model proposed in behavioural finance, whereby cognitive and emotional tendencies are filtered through risk appetite. The results of this study demonstrate partial mediation since there are still considerable direct pathways from the majority of biases to investing decisions, as well as significant mediated paths through risk tolerance.

The results challenge the Efficient Market Hypothesis (EMH), which assumes rational behaviour. Instead, the findings align with Prospect Theory (Kahneman & Tversky, 1979) and Disappointment Theory, which account for irrational tendencies, loss aversion, and emotional reactions to uncertainty.

Conclusions and Recommendations

This study evaluated how seven behavioural biases—three emotional (regret aversion, status quo, self-control) and four cognitive (representative, disposition effect, self-attribution, herding)—influence the investment decisions of PFAs in Nigeria. Using Structural Equation Modeling (SEM), 15 hypotheses were tested. Key findings indicate that there is Significant direct effects on investment decisions of regret aversion, status quo bias, disposition effect, herding bias, and representative bias. The Insignificant direct effects were found to be self-control and self-attribution biases. Similarly, Risk tolerance significantly mediated the relationships involving disposition effect, regret aversion, self-attribution, and status quo bias. This indicates that Risk tolerance itself had a strong direct effect on investment decisions, confirming its role as a vital determinant in financial behaviour.

The study concludes that behavioural biases play a critical role in shaping PFAs' investment choices. The disposition effect and herding bias were the most influential, highlighting tendencies to hold onto losing investments or follow the crowd. Regret aversion and status quo bias led to overly cautious decisions, undermining potential returns. Importantly, risk tolerance emerged as a pivotal mediating factor. PFAs with higher risk tolerance were less likely to succumb to emotionally charged or irrational decisions, demonstrating more strategic investment behaviour. This validates the theoretical framework that combines behavioural tendencies with psychological flexibility (risk tolerance) to explain real-world decisions. In summary, the study provides strong empirical support that investment decisions by PFAs are significantly influenced by behavioural biases, and that risk tolerance acts as a psychological buffer or amplifier of these effects.

This study therefore recommends based on the findings that PFAs should undergo behavioural finance training to increase self-awareness of biases. The capacity-building workshops should

include modules on cognitive errors and emotional regulation. Similarly, it is suggested that PenCom should develop regulatory guidelines that embed risk tolerance assessments into investment policy statements. Such regulations should promote diversification and discourage biased-driven overconcentration. As managers and financial fiduciaries; PFAs should adopt structured decision-making frameworks that include periodic bias audits. The use of decision support tools (e.g., AI-based portfolio analysis) can reduce emotional influence. Also the Risk profiling of portfolios should be mandatory and regularly updated and subjected to stress-testing under various behavioural scenarios to help build resilience.

The study also recommends the following future research directions where additional biases such as overconfidence, anchoring, and framing effects can be explored. Also longitudinal studies to assess how behavioural patterns evolve over time can be conducted alongside cross-sectional comparative research across other institutional investors like insurance companies or mutual funds. The use of mixed methods (quantitative + qualitative) may provide deeper psychological insights as well as investigating sectoral differences in bias expression and how economic context shapes behavioural dynamics.

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