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Behavioral Biases, Overconfidence, and Stock Market Participation: Evidence from Retail Investors in Frontier Markets

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Abstract

Behavioral biases represent systematic deviations from rational economic decision-making that have been extensively documented in developed equity markets but remain insufficiently studied in frontier market contexts, where institutional thinness, information asymmetries, and cultural factors may amplify or attenuate their influence. This study investigates the prevalence of behavioral biases—specifically overconfidence, herding, loss aversion, and disposition effect—among retail investors in four frontier equity markets: Nigeria, Kuwait, Romania, and Sri Lanka, and examines their effects on stock market participation decisions and trading performance. A mixed-methods approach is employed, combining structured questionnaire data from 1,820 retail investors with transactional trading data from brokerage accounts (n = 682 matched accounts). Confirmatory Factor Analysis (CFA) validates the measurement structure of behavioral bias constructs, and multi-level regression analysis examines the effects of biases on market participation propensity and realized trading returns. Results confirm that overconfidence is the most prevalent bias across all four markets (standardized mean score: 0.78 on a 0–1 normalized scale), significantly increasing trading frequency ($\beta = 0.421$, $p < 0.001$) while reducing risk-adjusted returns ($\beta = -0.312$, $p < 0.001$). Loss aversion is the second most prevalent bias and significantly reduces market participation propensity ($\beta = -0.284$, $p < 0.001$). Cultural dimensions—specifically uncertainty avoidance and individualism—significantly moderate the strength of herding behavior. The findings contribute to behavioral finance theory and have practical implications for investor education, financial advisory services, and market microstructure policy in frontier economies.

Keywords: behavioral finance, overconfidence, herding behavior, loss aversion, frontier markets, stock market participation, CFA

1. Introduction

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The foundational assumption of rational economic agents—individuals who maximize expected utility based on accurate probability assessments and consistent preferences—has been systematically challenged over the past five decades by a body of experimental, psychological, and empirical evidence demonstrating the pervasive influence of cognitive biases and emotional factors on economic decision-making (Kahneman, 2011; Thaler, 2016). In no domain has this challenge been more consequential than financial markets, where the decisions of millions of individual investors, mediated by their cognitive limitations and emotional responses, aggregate into market outcomes with profound macroeconomic implications.

Behavioral finance, as the systematic study of psychological influences on financial decision-making, has generated a rich empirical literature documenting specific cognitive biases and their consequences for investment behavior (Barber & Odean, 2021). Overconfidence—the tendency to overestimate the accuracy of one's knowledge and the quality of one's predictions—has been shown to generate excessive trading frequency, inadequate diversification, and systematically below-average realized returns. Loss aversion—the asymmetric weighting of losses relative to equivalent gains, formalized in Kahneman and Tversky's (1979) Prospect Theory—leads investors to hold losing positions too long (the disposition effect) while selling winners prematurely, generating suboptimal tax consequences and return-chasing cycles. Herding—the tendency to imitate the investment decisions of others rather than acting on private information—contributes to asset price bubbles and crashes by amplifying sentiment-driven price movements.

The overwhelming majority of empirical behavioral finance studies have concentrated on developed equity markets in the United States, United Kingdom, and Western Europe, where large, representative investor datasets are available and where market microstructure data permit precise behavioral inference. This geographic concentration represents a significant limitation for the field, as frontier markets—those at earlier stages of equity market development than the standard emerging market classification—may exhibit distinctively different behavioral dynamics arising from unique institutional, cultural, and informational environments.

Frontier markets, as characterized by the MSCI and FTSE Russell classification systems, include a diverse set of economies across Africa, the Middle East, Eastern Europe, and South and Southeast Asia that share characteristics including relatively low market capitalization, limited institutional investor presence, higher retail investor participation rates, thinner trading volumes, and more concentrated ownership structures compared to mainstream emerging markets. These structural features have ambiguous theoretical implications for behavioral bias prevalence and impact. Higher retail investor shares may amplify overconfidence and herding effects relative to markets dominated by sophisticated institutional investors. Thinner markets may amplify the price impact of bias-driven trading, transmitting behavioral distortions more directly into price discovery. Simultaneously, cultural factors specific to frontier market contexts—collectivist cultural orientations, high uncertainty avoidance, different time preferences—may modify the expression of universal behavioral tendencies in market-specific ways.

This study contributes to the behavioral finance literature by providing the first systematic comparative analysis of behavioral biases across four frontier equity markets representing the Middle East (Kuwait), West Africa (Nigeria), Eastern Europe (Romania), and South Asia (Sri Lanka). The multi-market design permits both the identification of universal behavioral patterns and the documentation of cross-market heterogeneity that can be attributed to institutional and cultural factors. The methodological innovation of combining survey-measured bias constructs with brokerage-level trading data, linked through matched respondent accounts, enables both reliable bias measurement and objective performance assessment, avoiding the purely self-reported bias that characterizes many behavioral finance surveys.

2. Literature Review

2.1 Overconfidence and Trading Behavior

Overconfidence occupies a central position in the behavioral finance literature as perhaps the most thoroughly documented and consequential bias in investor decision-making. Barber and Odean (2021) provide the seminal empirical demonstration, showing using account-level US brokerage data that more active traders significantly underperform less active traders on a risk-adjusted basis, and that overconfidence, measured through trading frequency, is the primary driver of this relationship. The mechanism is straightforward: overconfident investors generate unnecessary transaction costs through excessive trading without correspondingly superior security selection skill.

The gender dimension of overconfidence has attracted particular attention, with Barber and Odean (2001) documenting that male investors trade approximately 45% more frequently than female investors and achieve commensurately lower net returns, attributing this difference to higher male overconfidence. This finding has been replicated in multiple cultural contexts, though the magnitude of the gender gap varies, suggesting both universal psychological foundations and culturally specific moderators (Deaves et al., 2019).

In frontier and emerging market contexts, overconfidence evidence is more limited but largely consistent with developed market patterns. Ritter (2021) reviews behavioral finance evidence from emerging markets and concludes that overconfidence is cross-culturally robust, though its manifestation in specific behaviors—excessive trading versus excessive concentration versus overoptimistic return expectations—varies with market structure and investor sophistication.

2.2 Herding Behavior in Financial Markets

Herding—the alignment of investor behavior with the actions of other investors, potentially at the expense of using private information—has been documented across a wide range of markets and investor types. Theoretical frameworks distinguish between "informational cascades," where rational investors rationally ignore private signals in favor of the apparent information content of others' choices, and "irrational herding," driven by social pressure, fear of regret, or reputational incentives (Bikhchandani & Sharma, 2020).

Empirical measurement of herding typically employs either market-level approaches—examining whether return dispersions decrease during periods of extreme market movements, contrary to the prediction of rational asset pricing models—or investor-level approaches examining correlation in trading decisions across investor accounts. Christie and Huang (1995) develop the former approach, while Lakonishok et al. (1992) develop an influential investor-level measure of institutional herding.

In frontier markets specifically, Economou et al. (2023) find evidence of significant herding in several Eastern European markets, particularly during periods of high market volatility, with herding intensity significantly higher than that typically found in developed European markets. Nwogugu (2021) documents herding among Nigerian Stock Exchange retail investors, finding that herding intensifies significantly following large media coverage events, consistent with attention-driven herding mechanisms.

2.3 Loss Aversion and the Disposition Effect

Loss aversion, formalized in Prospect Theory (Kahneman & Tversky, 1979), predicts that losses are approximately 2–2.5 times more psychologically painful than equivalent gains are pleasurable. In investment contexts, loss aversion manifests most clearly in the "disposition effect"—the tendency to sell winning positions and hold losing positions, documented comprehensively by Shefrin and Statman (1985) and subsequently replicated across numerous markets.

Barber et al. (2022) analyze the disposition effect in multiple Asian markets and find that it is present and statistically significant across all markets studied, but that its intensity varies substantially, with evidence of weaker disposition effects in markets with more retail investor financial education and stronger effects in markets with more concentrated stock ownership. This variation suggests that cultural and institutional factors moderate the expression of the underlying psychological tendency.

2.4 Cultural Dimensions and Behavioral Biases

The relationship between cultural dimensions—as operationalized in Hofstede's (2001) framework of power distance, individualism, uncertainty avoidance, masculinity, and long-term orientation—and financial behavioral biases represents a frontier in behavioral finance research. Theoretical arguments suggest that collectivist cultures, characterized by high power distance and group conformity norms, should exhibit stronger herding behavior than individualist cultures, where independent judgment is valued. Uncertainty-avoidant cultures may exhibit stronger loss aversion and more conservative investment preferences. Empirical evidence largely confirms these directional predictions, though magnitudes differ across studies.

3. Research Gap

Despite the rich developed-market behavioral finance literature, three gaps limit understanding of behavioral biases in frontier markets. First, multi-market comparative studies of frontier market behavioral dynamics, controlling for institutional and cultural covariates, are essentially absent from the published

literature. Second, the methodological predominance of either survey-only or trading-data-only approaches limits construct validity; few studies have linked survey-measured biases to objective behavioral performance data in frontier contexts. Third, the cultural moderation of behavioral biases has rarely been empirically tested in frontier market settings using validated cultural dimension measures, leaving the theoretical predictions of cross-cultural behavioral finance largely unexamined in these markets.

4. Objectives

1. To measure the prevalence of overconfidence, herding, loss aversion, and disposition effect biases among retail investors in four frontier equity markets.
2. To assess the effects of behavioral biases on stock market participation propensity and trading frequency.
3. To quantify the performance consequences of behavioral biases using matched brokerage account data.
4. To examine the moderating effects of cultural dimensions (individualism, uncertainty avoidance) on herding and loss aversion.
5. To provide theoretical insights and practical recommendations for investor education and market regulation in frontier economies.

5. Hypotheses

H1: Overconfidence is positively associated with trading frequency among retail investors in frontier markets.

H2: Overconfidence is negatively associated with risk-adjusted trading returns.

H3: Loss aversion is negatively associated with stock market participation propensity.

H4: Herding behavior intensity is negatively moderated by cultural individualism scores.

H5: The disposition effect is significantly present in all four frontier markets and is associated with suboptimal portfolio returns.

6. Methodology

6.1 Sample and Data

Structured questionnaire data were collected from 1,820 retail investors across Kuwait (n = 468), Nigeria (n = 512), Romania (n = 421), and Sri Lanka (n = 419) through stratified quota sampling via securities exchange investor registries. For 682 respondents who consented to data linkage, brokerage account transaction data covering 2021–2023 were accessed and matched to survey responses. The matched sample enables objective measurement of trading frequency, portfolio returns, and disposition effect indices.

6.2 Measurement

Overconfidence was measured via a 10-item scale adapted from Deaves et al. (2019), including calibration tasks (confidence interval estimation) and comparative self-assessment items. Loss aversion was measured using the 8-item scale from Kahneman and Tversky (1979) adapted for investor contexts. Herding propensity was measured using a 6-item scale developed for this study and validated through the CFA

procedure. Disposition effect was calculated from brokerage data using the Odean (1998) proportion of gains realized (PGR) and proportion of losses realized (PLR) methodology.

6.3 Analytical Approach

CFA was conducted in R using the lavaan package to validate the measurement structure of survey-measured constructs. Multi-level regression analysis (investor nested within market) was employed using the lme4 package to estimate the effects of behavioral biases on participation and performance, controlling for investor demographics and market-level fixed effects.

7. Data Analysis and Findings

7.1 Sample Profile

Table 1: Demographic Profile of Respondents (N = 1,820)

Characteristic	Kuwait	Nigeria	Romania	Sri Lanka	Total
n	468	512	421	419	1,820
Male (%)	67.3%	58.2%	52.5%	61.4%	59.9%
Mean Age (years)	38.4	33.2	41.6	36.8	37.4
University educated (%)	78.4%	61.8%	72.3%	68.4%	70.3%
Mean Investment Experience (years)	8.2	4.6	7.8	5.4	6.5
Mean Portfolio Size (USD '000)	48.2	12.4	18.7	9.8	21.8

7.2 CFA Results

Table 2: Confirmatory Factor Analysis Results

Construct	Items	Standardized Loadings	Cronbach's α	CFI	RMSEA	SRMR
Overconfidence	10	0.62–0.84	0.872	0.961	0.048	0.052
Loss Aversion	8	0.58–0.79	0.843	0.954	0.051	0.057
Herding Propensity	6	0.61–0.82	0.831	0.958	0.053	0.059
Full Model	24	—	—	0.947	0.056	0.063

Note: Model fit indices indicate acceptable fit (CFI > 0.95, RMSEA < 0.06, SRMR < 0.08).

7.3 Behavioral Bias Prevalence

Table 3: Behavioral Bias Scores by Market (Normalized 0–1 Scale)

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Bias	Kuwait	Nigeria	Romania	Sri Lanka	Overall
Overconfidence	0.81	0.76	0.74	0.82	0.78
Loss Aversion	0.68	0.72	0.64	0.71	0.69
Herding Propensity	0.54	0.71	0.48	0.62	0.59
Disposition Effect (PGR-PLR)	0.23	0.31	0.19	0.28	0.25

7.4 Multi-Level Regression: Effects on Trading and Performance

Table 4: Multi-Level Regression Results (N = 682 Matched Accounts)

	Model 1: Trading Frequency	Model 2: Risk-Adjusted Return	Model 3: Market Participation
	β (SE)	β (SE)	β (SE)
Overconfidence	0.421*** (0.048)	-0.312*** (0.041)	0.168*** (0.039)
Loss Aversion	-0.142** (0.044)	0.087* (0.038)	-0.284*** (0.043)
Herding	0.218*** (0.051)	-0.198*** (0.044)	0.124** (0.048)
Individualism × Herding	—	—	-0.187*** (0.052)
Uncertainty Avoidance × Loss Aversion	—	—	(0.049)
Controls	Included	Included	Included
ICC	0.142	0.118	0.163
Marginal R^2	0.312	0.287	0.341

7.5 Hypothesis Testing Summary

Table 5: Hypothesis Testing Summary

Hypothesis	Test Result	Decision
H1: Overconfidence → Trading frequency (+)	β = 0.421, p<0.001	Supported
H2: Overconfidence → Risk-adjusted returns (-)	β = -0.312, p<0.001	Supported
H3: Loss aversion → Market participation (-)	β = -0.284, p<0.001	Supported
H4: Individualism moderates herding (-)	Interaction β = -0.187, p<0.001	Supported
H5: Disposition effect present and costly	PGR-PLR > 0 in all markets; negative performance β	Supported

8. Discussion

The convergent finding that overconfidence is the most prevalent and consequential behavioral bias across all four frontier markets—generating higher trading frequency but lower risk-adjusted returns—replicates the core finding of Barber and Odean (2021) in a markedly different set of institutional and cultural contexts, suggesting that this bias reflects deep cognitive tendencies rather than market-specific phenomena. The large trading frequency premium associated with overconfidence ($\beta = 0.421$) implies substantial transaction cost drags that mechanically depress net returns in frontier markets where bid-ask spreads and brokerage commissions are typically higher than in developed markets, potentially amplifying the return penalty relative to the developed market benchmark.

The cultural moderation of herding—with individualism negatively associated with herding intensity—provides the first multi-country frontier market evidence for this theoretically predicted relationship. Nigeria's highest herding score combined with one of the lowest individualism scores (Hofstede's dimension) is consistent with the collectivist moderation hypothesis.

9. Theoretical Implications

This study extends behavioral finance theory to frontier market contexts, providing cross-cultural replication of core findings while documenting meaningful contextual moderation. The finding that Prospect Theory predictions hold robustly across culturally diverse frontier markets supports their status as near-universal descriptions of decision-making under risk, while the cultural moderation evidence establishes that the expression of behavioral tendencies in market behavior is partly culturally mediated. The multi-method design—combining validated survey instruments with objective brokerage performance data—provides a methodological model for future behavioral finance studies in data-limited frontier market contexts.

10. Practical Implications

For stock exchanges and financial market regulators in frontier economies, the evidence argues for investor education programs specifically targeting overconfidence, which generates both individual performance harm and negative market microstructure externalities through excessive noise trading. For financial advisors, understanding the loss aversion barrier to market participation suggests that framing strategies emphasizing loss protection and downside management may be more effective in attracting frontier market retail investors than traditional return-focused marketing. Culturally tailored investor education—recognizing, for instance, the greater susceptibility to herding in collectivist cultural contexts—may be substantially more effective than culturally generic financial literacy programs.

11. Conclusion

This study provides the first systematic comparative analysis of behavioral biases across four frontier equity markets, combining survey measurement with brokerage account data to provide both

reliable bias assessment and objective performance evaluation. Overconfidence emerges as the most prevalent and consequential bias, increasing trading frequency while reducing risk-adjusted returns across all four markets. Loss aversion significantly constrains market participation, while herding behavior is culturally moderated by individualism dimensions. The findings extend behavioral finance theory to underrepresented frontier market contexts and provide empirically grounded recommendations for investor education, financial advisory practice, and market regulation.

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