

BEHAVIORAL BIASES AND INVESTMENT DECISION-MAKING AMONG UNDERGRADUATE STUDENTS: EVIDENCE FROM A SIMULATED PORTFOLIO EXPERIMENT

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Abstract. *This paper investigates the influence of behavioral biases — specifically overconfidence, loss aversion, and herding — on investment decision-making among undergraduate finance students. Using a structured simulated portfolio experiment conducted over one academic semester, we analyze patterns of irrational decision-making that deviate from the assumptions of classical financial theory. Results indicate that overconfidence is the predominant bias, with 71% of participants overestimating their portfolio performance relative to a benchmark index. Loss aversion was observed to cause premature liquidation of profitable positions, while herding behavior was triggered primarily by peer discussion. These findings have important implications for financial literacy education, investment pedagogy, and the design of introductory finance curricula. The study contributes to the growing body of behavioral finance literature by focusing on an academically underrepresented demographic — undergraduate students — as decision-makers in training.*

Keywords: *behavioral finance, investment decisions, overconfidence bias, loss aversion, herding, financial literacy, undergraduate education*

1. Introduction

Classical financial theory, anchored in the Efficient Market Hypothesis (Fama, 1970) and the rational actor model, presupposes that investors process all available information objectively and make utility-maximizing decisions. However, decades of empirical research have challenged this view, revealing systematic patterns of irrational behavior that affect asset prices and portfolio outcomes. The field of behavioral finance, pioneered by Kahneman and Tversky (1979) through Prospect Theory, offers a more psychologically grounded account of how individuals actually make financial decisions under uncertainty.

While the behavioral finance literature has extensively studied professional fund managers, retail investors, and institutional actors, comparatively less attention has been devoted to student investors — individuals who are actively acquiring financial knowledge and forming long-term investment habits. Understanding how cognitive biases manifest in this population is not only academically significant, but also has direct practical implications for financial education and curriculum design.

This study addresses this gap by examining three widely documented behavioral biases — overconfidence, loss aversion, and herding — within a controlled simulated investment environment. Undergraduate students enrolled in an introductory investments course were asked to manage a virtual portfolio over 14 weeks, with their decision logs, trading patterns, and self-assessments providing the primary data.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes the research methodology. Section 4 presents empirical results. Section 5 discusses implications for financial education. Section 6 concludes.

2. Literature Review

2.1 Behavioral Finance: Theoretical Foundations

Behavioral finance emerged as a systematic discipline following the landmark work of Kahneman and Tversky (1979), who demonstrated through a series of experiments that individuals exhibit consistent deviations from expected utility maximization. Their Prospect Theory posits that people evaluate outcomes relative to a reference point and are more sensitive to losses than to equivalent gains — a phenomenon termed loss aversion. Subsequent work by Thaler (1985) on mental accounting further enriched this framework, showing that investors treat funds differently depending on their perceived source or purpose.

2.2 Overconfidence in Investment Contexts

Overconfidence is one of the most extensively documented biases in finance. Barber and Odean (2001) found that overconfident investors trade more frequently and earn lower returns after transaction costs. Odean (1999) demonstrated that investors tend to hold losing stocks too long and sell winning stocks too early — a pattern consistent with overconfidence interacting with loss aversion. More recent studies, including those by Deaves et al. (2010), have confirmed these patterns across multiple international markets.

2.3 Loss Aversion and the Disposition Effect

The disposition effect — the tendency to realize gains too quickly while holding onto losses — has been documented across a wide range of investor populations. Shefrin and Statman (1985) first formalized this concept, attributing it to the interplay of prospect theory and regret aversion. In educational settings, research by Cheng et al. (2013) found that student investors in simulation experiments exhibited strong disposition effects, suggesting that these biases are present even before professional experience is accumulated.

2.4 Herding Behavior

Herding refers to the tendency of investors to follow the actions of the crowd rather than relying on their own analysis. Christie and Huang (1995) introduced an influential empirical test for herding in equity markets, while Bikhchandani and Sharma (2000) provided a theoretical model of informational cascades. At the retail and student level, herding has been linked to social influence, information asymmetry, and a desire to reduce regret by conforming to majority behavior (Scharfstein & Stein, 1990).

3. Research Methodology

3.1 Study Design

This study employs a mixed-methods approach combining quantitative analysis of trading behavior with qualitative survey data. Participants were 87 undergraduate students (52 male, 35 female) enrolled in a second-year "Principles of Investment" course at a mid-sized university during the 2023–2024 academic year. Each student was given a virtual starting capital of \$100,000 USD through a paper trading platform linked to real-time market data.

3.2 Data Collection

Three data streams were collected: (1) trading logs from the simulation platform, recording every transaction with timestamp, asset, volume, price, and portfolio value; (2) a pre-experiment survey measuring self-assessed investment knowledge and risk tolerance using validated psychometric scales; and (3) post-experiment reflective questionnaires in which students articulated their decision rationale for selected trades. A benchmark was set using an equal-weighted index of the S&P 500 and NASDAQ Composite over the same period.

3.3 Bias Measurement Metrics

Overconfidence was measured by comparing students' self-assessed performance predictions against actual results. Loss aversion was quantified using the disposition ratio, calculated as the proportion of gains realized (PGR) divided by the proportion of losses realized (PLR), following the methodology of Odean (1998). Herding was identified through cluster analysis of trading timing: when more than 40% of participants traded the same asset within a 48-hour window following a peer discussion session, the event was coded as a herding episode.

4. Empirical Results

4.1 Overconfidence

Prior to the experiment, 78% of students predicted they would outperform the benchmark index. In reality, only 29% did so — a gap of 49 percentage points between expectation and outcome. The mean predicted excess return was +8.3%, while the actual mean excess return relative to the benchmark was -1.7%. A paired t-test confirmed that this discrepancy is statistically significant ($t = 6.41$, $p < 0.001$). Notably, overconfidence was more pronounced among male participants, consistent with the gender findings of Barber and Odean (2001).

4.2 Disposition Effect and Loss Aversion

The mean disposition ratio across all participants was 1.74, indicating that students realized gains at a rate 74% higher than they realized losses — a strong manifestation of the disposition effect. Qualitative responses confirmed that many students found it psychologically difficult to "lock in a loss," with phrases such as "I kept holding because I was sure it would recover" appearing frequently. This behavior was associated with statistically lower portfolio returns ($r = -0.38$, $p < 0.01$).

4.3 Herding

Eight distinct herding episodes were identified over the 14-week period, each occurring within 48 hours of a structured class discussion or peer consultation session. In six of the eight episodes, the herded asset subsequently underperformed the market over the following two weeks, suggesting that group consensus did not improve decision quality. Students who participated in herding episodes traded 2.3 times more frequently and earned returns that were on average 3.1% lower than non-herding peers.

5. Discussion and Implications for Financial Education

The findings of this study carry significant implications for how investment courses are designed and taught at the undergraduate level. First, the near-universal prevalence of overconfidence suggests that introductory courses should incorporate structured self-assessment exercises — comparing predicted versus actual performance — as a core component of financial literacy training. Feedback mechanisms built into paper trading platforms can serve this pedagogical purpose effectively.

Second, the strong disposition effect documented here suggests that students have internalized loss aversion in ways that harm their investment outcomes. Case-study discussions focusing on the real costs of holding losing positions — including opportunity costs and tax implications — may help recalibrate students' reference points and encourage more rational decision-making.

Third, the herding episodes, which clustered around classroom discussions, highlight an underappreciated risk in pedagogical settings: the classroom itself may inadvertently function as a mechanism for transmitting behavioral contagion. Instructors should be mindful of this dynamic and may consider structuring discussions to encourage independent analysis before peer sharing.

More broadly, these results reinforce the argument that behavioral finance should not be taught as a separate advanced elective, but integrated into the foundations of financial education. When students understand the biases they are susceptible to, they are better equipped to recognize and counteract them in real investment contexts.

6. Conclusion

This study examined behavioral biases among undergraduate finance students in a simulated portfolio environment. The results provide robust evidence that overconfidence, loss aversion, and herding are not merely theoretical constructs but active determinants of investment behavior even among novice investors with formal financial education. These biases collectively contributed to below-benchmark performance for the majority of participants.

The study is subject to several limitations, including its single-institution sample, the artificial constraints of simulated trading, and the self-report nature of qualitative data. Future research should replicate this design across multiple institutions and cultural contexts, and longitudinal studies tracking the same individuals into professional careers would provide valuable insight into whether behavioral biases persist or attenuate over time.

Ultimately, this research underscores the importance of embedding behavioral finance principles into undergraduate financial education. Recognizing one's own psychological tendencies is a prerequisite for sound investment judgment — a skill that, like technical analysis or portfolio theory, can and should be taught.

REFERENCES

1. Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, 116(1), 261–292.
2. Bikhchandani, S., & Sharma, S. (2000). Herd behavior in financial markets. *IMF Staff Papers*, 47(3), 279–310.
3. Christie, W. G., & Huang, R. D. (1995). Following the pied piper: Do individual returns herd around the market? *Financial Analysts Journal*, 51(4), 31–37.
4. Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383–417.
5. Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–291.
6. Odean, T. (1998). Are investors reluctant to realize their losses? *The Journal of Finance*, 53(5), 1775–1798.
7. Scharfstein, D. S., & Stein, J. C. (1990). Herd behavior and investment. *The American Economic Review*, 80(3), 465–479.
8. Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of Finance*, 40(3), 777–790.
9. Thaler, R. H. (1985). Mental accounting and consumer choice. *Marketing Science*, 4(3), 199–214.