IAIC Transactions on Sustainable Digital Innovation (ITSDI)
Vol. 7, No. 2, April 2026, pp. 208−215
E-ISSN: 2715-0461 P-ISSN: 2686-6285, DOI:10.34306

The Impact of Gamification on Retail Investor Behavior: A Behavioral Finance Perspective

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Article Info

Article history:

Submission February 25, 2026
Revised March 19, 2026
Accepted March 27, 2026
Published April 19, 2026

Keywords:
Gamification
Behavioral Finance
Trading Frequency
Risk-Taking
Digital Investing

ABSTRACT

The rapid growth of commission-free, mobile-based trading apps has made it easier for retail investors to participate in financial markets while introducing gamification features that influence how they make decisions. **This study examines** how these gamified elements affect trading frequency, risk-taking, and cognitive biases, as well as the ethical and regulatory implications that arise. **We conducted a systematic literature review** of studies published between 2021 and 2025, analyzing peer-reviewed articles and regulatory reports focused on behavioral finance, gamification psychology, and fintech governance. **The research asks three main questions**: How do gamification features influence trading frequency? How do they affect investors' risk-taking behavior? Which behavioral biases are most reinforced? Based on these, we formulated hypotheses to explore the relationships in detail. **The findings** show that animations, rewards, and social comparison features increase trading activity, encourage higher risk tolerance, and strengthen biases such as overconfidence and the disposition effect. Ethical concerns, including misaligned incentives, potential behavioral manipulation, and weaker investor protection, highlight the need for responsible platform design and thoughtful regulatory oversight. Overall, the study contributes by connecting behavioral finance theory with gamification psychology, offering insights into the psychological mechanisms at play in digital investing. **Future research** should empirically test these hypotheses, investigate long-term investor outcomes, and develop ethical guidelines that balance engagement with responsible investing practices.

DOI: https://doi.org/10.34306/itsdi.v7i2.727

1. INTRODUCTION

The rapid advancement of financial technology has significantly changed how individuals participate in financial markets, particularly through the emergence of mobile-based, commission-free trading applications [1, 2]. These platforms have removed traditional barriers such as high transaction costs and complex interfaces, offering real-time access to a wide range of financial instruments. To attract and retain users in a highly competitive environment, many trading apps have introduced gamification features, such as animations, achievement badges, reward notifications, and social leaderboards. While these features enhance usability and engagement,

they also reshape how users make investment decisions, often turning trading into an experience resembling digital gameplay.

Although gamification can democratize access to financial markets, it raises important questions about investor behavior. Insights from behavioral finance indicate that decision-making is influenced by cognitive biases and emotional triggers, which gamified features may amplify [3]. For example, visual rewards and instant feedback can encourage overconfidence, excessive trading, and short-term risk-taking, particularly among inexperienced retail investors. At the same time, the integration of these features may create ethical concerns and regulatory challenges, as engagement-driven designs could prioritize platform metrics over investor welfare [4, 5].

Despite growing research in this area, there is a lack of studies examining how multiple gamification features interact to influence specific behavioral outcomes in trading. Most existing literature analyzes features individually or descriptively, without linking them to explicit psychological mechanisms. To address this gap, this study explores the following research questions: How do gamification features influence trading frequency? How do they affect investors' risk-taking behavior? Which behavioral biases are most reinforced in gamified trading environments? Based on these questions, three corresponding hypotheses are formulated to test the relationships between gamification features, investor behavior, and cognitive biases [6, 7].

This study focuses on retail investors using mobile-first, zero-commission trading applications in developed markets and employs a systematic literature review to synthesize findings from 2021 to 2025. By integrating insights from behavioral finance, gamification psychology, and fintech ethics, this research contributes to understanding the psychological mechanisms driving investor behavior, highlights potential ethical and regulatory implications, and aligns with the United Nations Sustainable Development Goals, particularly SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities). The findings aim to inform investors, platform designers, and regulators on creating responsible and sustainable digital investing practices [8, 9].

2. LITERATURE REVIEW

2.1. Behavioral Finance and Decision-Making

Behavioral finance challenges the traditional assumption of fully rational investors by demonstrating that decision-making is systematically influenced by cognitive biases and emotional triggers. Overconfidence, for example, leads investors to overestimate their knowledge and underestimate market risks, often resulting in excessive trading and lower net returns. The disposition effect encourages early selling of winning assets while holding onto losing positions, anticipating price recovery. Confirmation bias reinforces pre-existing beliefs by prompting investors to selectively attend to information that supports their expectations. In digital trading environments, these biases are often amplified by real-time price updates and immediate feedback, which compress decision-making timeframes and reduce reflective analysis [10].

Table 1. Behavioral Biases Influenced by Gamified Trading

Behavioral Bias	**Description**	**Gamification Trigger**	**Impact**
Overconfidence	Overestimation of skill	Rewards, badges	Excessive trading
Disposition Effect	Early selling of winners	Instant feedback	Suboptimal returns
Confirmation Bias	Selective information use	Personalized feeds	Risk amplification

Table 1 maps core behavioral finance biases to gamification triggers, clarifying how gamified interfaces can amplify irrational decision-making and influence investor outcomes.

2.2. The Psychology of Gamification

Gamification has been widely studied as a behavioral intervention strategy across non-financial domains, including education, healthcare, and consumer engagement [11, 12]. Key psychological mechanisms include instant gratification, reward anticipation, and social validation. Design elements such as badges, progress bars, and achievement notifications create feedback loops that increase user engagement by triggering dopamine-related reward responses [13, 14]. While these mechanisms enhance participation and short-term motivation, overreliance on extrinsic rewards may encourage repetitive behavior without fostering self-regulation or long-term understanding.

2.3. The Intersection of Gamification and Investing

Gamification in trading platforms has drawn growing scholarly and regulatory attention due to its impact on investor behavior. Empirical studies show that features like celebratory animations and competitive leaderboards increase trading frequency and portfolio turnover among retail investors [15, 16]. Social comparison tools and performance metrics may frame trading as a game-like activity rather than a financial commitment, increasing risk-taking behavior. Regulatory analyses argue that engagement-driven designs blur the line between investing and entertainment, promoting impulsive and speculative decisions [17, 18].

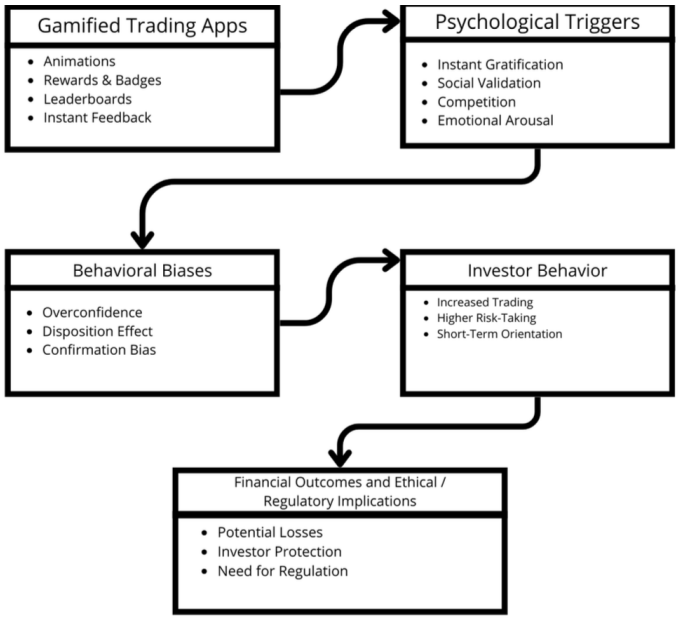

Figure 1. Conceptual framework of gamified trading and investor behavior

Figure 1 illustrates the conceptual framework of gamified trading and investor behavior, showing how platform features trigger psychological responses, influence behavioral biases, and ultimately shape investor decisions and financial outcomes, while highlighting associated ethical and regulatory implications.

Despite these findings, most studies examine individual gamification elements in isolation [19, 20]. There is a lack of research integrating multiple features to understand their combined effect on behavioral biases. This study fills that gap by linking gamification psychology with behavioral finance and fintech ethics, forming the foundation for the research questions: How do gamification features influence trading frequency? How do they affect investors' risk-taking behavior? Which behavioral biases are most reinforced? Corresponding hypotheses (H1-H3) are formulated to test these relationships empirically [21–23].

2.4. Summary of Empirical Findings

Table 2 summarizes key empirical studies linking gamification in trading platforms with observed changes in investor behavior.

Table 2. Summary of Key Literature on Gamification in Trading Platforms

Author(s)	Year	Context	Gamification Feature	Key Findings
Alhadeff et al.	2022	Retail trading apps	Visual rewards, animations	Increased trading frequency
Barber et al.	2022	Mobile trading	Attention cues	Higher speculative behavior
ESMA	2023	EU market	Gamified UX	Elevated behavioral risk

Table 2 highlights consistent evidence that gamified elements such as visual rewards, badges, and

leaderboards increase trading activity and risk-taking. These findings demonstrate that gamification actively reinforces behavioral biases rather than merely coexisting with them.

This literature review establishes the theoretical and empirical foundation for the study, linking gamification features to measurable investor behaviors, highlighting ethical concerns, and providing a clear path toward the research questions and hypotheses explored in the methodology section [24–26].

3. METHODOLOGY

This study employs a Systematic Literature Review (SLR) to investigate how gamification features in trading platforms influence retail investor behavior. The SLR approach was chosen because the topic spans multiple disciplines, including behavioral finance, gamification psychology, and financial technology, each contributing distinct theoretical and empirical insights [27, 28].

3.1. Data Sources and Selection Criteria

Relevant literature was retrieved from established academic databases, including Scopus, Web of Science, ScienceDirect, and Google Scholar, which are commonly used in fintech and behavioral finance research [29, 30]. To complement academic perspectives, regulatory reports and policy documents from financial authorities were also included, providing practical insights into investor protection and market governance [31, 32].

A total of 214 academic articles and 18 regulatory reports published between 2021 and 2025 were initially identified. The inclusion criteria were as follows: studies must (1) be written in English, (2) explicitly address gamification, digital trading platforms, or investor behavior, and (3) focus on mobile-first or commission-free trading apps. Studies focusing solely on traditional financial markets or lacking behavioral or digital design considerations were excluded. Each article was assessed for quality using a modified CASP checklist to ensure methodological rigor, clarity of results, and relevance to the research objectives.

3.2. Analysis Technique

The selected studies were analyzed using a thematic synthesis approach, which allows integration of recurring concepts across heterogeneous research designs [33]. Initial coding focused on identifying gamification features embedded in trading platforms, followed by an analysis of reported behavioral outcomes such as trading frequency, risk tolerance, and reinforcement of cognitive biases. These themes were iteratively refined to include ethical and regulatory considerations related to engagement-driven business models [34].

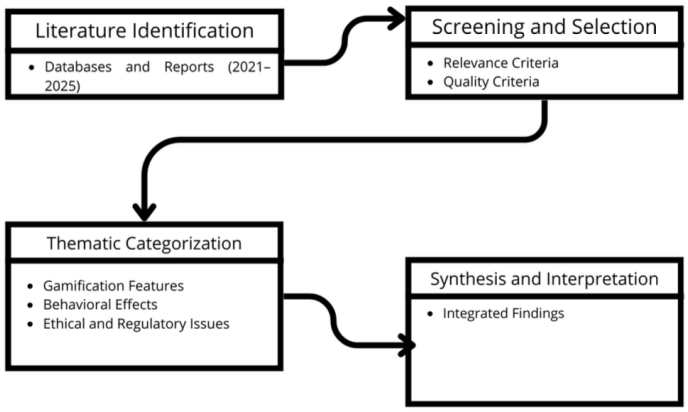

Figure 2. Outlines the sequential steps of the literature review process, from identifying relevant sources to synthesizing thematic findings that inform the analysis.

Figure 2 illustrates the sequential steps of the systematic literature review process, highlighting how relevant sources were identified, screened, categorized thematically, and synthesized to extract integrated findings that inform the analysis. This approach ensures transparency, reproducibility, and methodological rigor, while providing a comprehensive understanding of how gamification shapes investor behavior and ethical implications in digital investing.

4. RESULTS AND DISCUSSION

4.1. Behavioral Effects of Gamification

The literature synthesis shows that gamification features in trading platforms, such as animations, reward systems, and leaderboards, significantly influence retail investor behavior. These features increase trading frequency, elevate risk tolerance, and reinforce cognitive biases like overconfidence and the disposition effect. Social comparison mechanisms, such as leaderboards, further amplify sensation-seeking tendencies and encourage short-term speculative trading. These findings directly address the research questions: gamification features affect trading frequency (RQ1), risk-taking behavior (RQ2), and reinforce behavioral biases (RQ3). The results support the proposed hypotheses (H1–H3).

Table 3. Common Gamification Features in Trading Platforms

Feature	Description	Behavioral Effect
Animations	Trade celebration visuals	Reinforced trading
Leaderboards	User rankings	Increased risk-taking
Rewards	Badges and achievements	Habit formation, repetitive trading

Table 3 demonstrates how gamification features strategically increase engagement and amplify cognitive biases through repeated feedback loops.

4.2. Ethical and Regulatory Implications

Gamified trading designs raise ethical and regulatory concerns. Engagement-driven platforms may create misaligned incentives where user activity is prioritized over investor outcomes. Behavioral manipulation through dark patterns, undisclosed risks, or reward-driven prompts can compromise investor protection, especially for inexperienced retail investors. Existing regulations largely focus on disclosure and market integrity, leaving gaps in addressing behavioral influences.

Table 4. Ethical and Regulatory Issues in Gamified Trading Platforms

Issue	Description	Regulatory Concern
Dark patterns	Manipulative UX design	Investor protection
Incentive misalignment	Engagement over welfare	Consumer harm
Transparency gap	Undisclosed behavioral risks	Regulatory oversight

Table 4 highlights the main ethical and regulatory challenges, emphasizing the need for design and oversight that align platform engagement with investor protection.

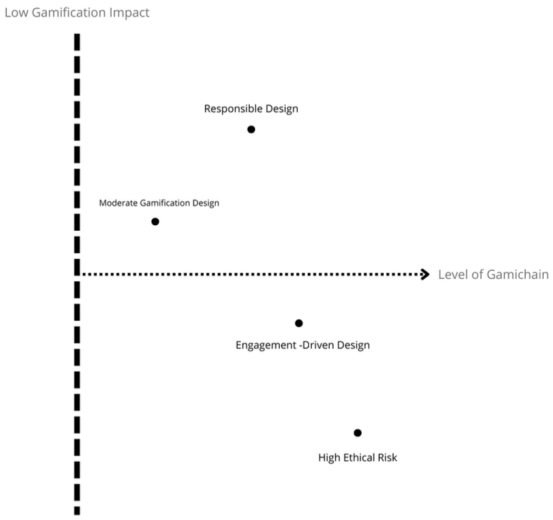

Figure 3. Relationship between gamification level and ethical risk

Figure 3 illustrates the relationship between the level of gamification in trading platforms and the associated ethical risk, showing how low, moderate, and high gamification designs correspond to varying degrees of investor protection, potential manipulation, and the need for responsible oversight to align platform engagement with ethical standards.

4.3. Integration with Behavioral Theory

The observed behavioral outcomes can be explained using behavioral finance and gamification psychology frameworks. Self-determination theory indicates that extrinsic rewards increase engagement but may not foster long-term intrinsic motivation. Dual-process theory explains how immediate feedback triggers intuitive, emotion-driven decisions over deliberative reasoning. Operant conditioning shows that repeated reward structures reinforce short-term trading habits. Integrating these theories helps explain why gamification amplifies specific investor behaviors.

4.4. Implications for Practice and Future Research

The findings offer practical guidance for investors, platform designers, and regulators. Investors should recognize how gamification influences trading decisions. Designers should balance engagement mechanisms with responsible investing principles. Regulators may adopt design-oriented oversight, evaluating psychological effects alongside financial risk. Future research should empirically test the proposed hypotheses, investigate long-term investor outcomes, and develop ethical design guidelines that align engagement with sustainable investing practices.

5. MANAGERIAL IMPLICATIONS

The findings of this study provide practical insights for investors, platform designers, and regulatory authorities. Investors should be aware that gamification features such as animations, leaderboards, and rewards can influence their trading decisions, potentially increasing risk-taking and reinforcing cognitive biases. Platform designers are encouraged to implement gamification responsibly, balancing engagement with investor protection by integrating educational tools, transparent risk notifications, and limits on reward-driven behaviors. Regulatory authorities should consider design-oriented oversight, evaluating the psychological impact of platform features alongside traditional financial risk, to ensure that innovation does not compromise investor welfare. By aligning platform incentives with responsible investing, stakeholders can foster sustainable digital investment practices that mitigate potential negative behavioral outcomes.

6. CONCLUSION

This study examined the impact of gamification in commission-free trading platforms on retail investor behavior through a systematic literature review. The analysis revealed that gamified elements, including visual rewards, achievement badges, and social comparison mechanisms, consistently increase trading frequency, elevate risk-taking behavior, and amplify cognitive biases such as overconfidence and the disposition effect. The findings underscore that gamification is not a neutral design choice but a behavioral mechanism that significantly shapes investor decisions and outcomes.

Moreover, the study highlights critical ethical and regulatory considerations. Engagement-driven business models may create misaligned incentives where platform success is measured by user activity rather than investor welfare. Behavioral manipulation through interface design, dark patterns, or undisclosed risks can compromise investor protection, especially for inexperienced retail investors. Addressing these challenges requires both responsible platform design and regulatory oversight that considers psychological effects alongside traditional financial risks.

Overall, this study contributes to the literature by integrating behavioral finance theory with gamification psychology and fintech ethics. It provides a conceptual framework linking gamification features to measurable investor behaviors, identifies ethical and regulatory implications, and offers guidance for sustainable digital investing practices. Future research should empirically test the hypotheses, explore long-term investor outcomes, and develop ethical gamification guidelines that align user engagement with responsible and sustainable investment strategies.

7. DECLARATIONS

7.1. About Authors

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7.2. Author Contributions

Conceptualization: TP, LM, and KS; Methodology: TP; Software: LM; Validation: KS; Formal Analysis: KS and NL; Investigation: LM and KS; Resources: NL; Data Curation: TP and LM; Writing Original Draft Preparation: LM and KS; Writing Review and Editing: TP; Visualization: NL; All authors, TP, LM, KS and NL, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7.4. Funding

The authors confirm that this research, its authorship, and publication were conducted without any financial support.

7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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