

Toward an Integrated View of Investor Behavior: A Bibliometric Study on Financial Literacy and Psychological Biases

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Article Info	Abstract
Keywords: Investor behavior; Financial literacy; Behavioral biases; Gen Z; Cryptocurrency; Digital finance; Decision-making;	This study investigates the intersection between financial literacy and behavioral biases in investment decision-making, addressing the limited theoretical and empirical integration between the two domains. Adopting a quantitative exploratory bibliometric design, data were collected from 1,000 peer-reviewed journal articles indexed in CrossRef (2014–2025) using Publish or Perish, with purposive sampling based on metadata relevance. The dataset was analyzed using VOSviewer, which produced three core visualizations—network, overlay, and density—to map the intellectual structure, thematic development, and research intensity. The findings reveal four major clusters: financial literacy, behavioral biases, digital innovation, and empirical approaches. Financial literacy emerges as the cognitive foundation of investor behavior, while biases such as overconfidence and herding impede rational decision-making—especially in digital contexts and among younger generations. The study concludes that a cross-domain approach is essential for comprehensively understanding contemporary investment behavior. It recommends integrating technology-driven financial education with behavioral awareness to inform more inclusive and adaptive policy and market interventions.
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1. Introduction

The contemporary financial environment presents a complex interplay of digital innovation, behavioral dynamics, and market volatility. Retail participation has surged across decentralized finance platforms, with cryptocurrency markets illustrating how perceptual salience—rather than intrinsic value—often drives investment decisions, resulting in price distortions and return anomalies (Chen, Lepori, Tai, & Sung, 2022). These behavioral patterns are particularly evident among millennial investors, whose decisions are influenced by group-based biases such as overconfidence, herding, and fear of missing out (Altaf & Jan, 2023). Empirical findings further indicate that financial literacy plays a significant protective role: individuals with higher levels of financial competence are less susceptible to such distortions, especially in emerging market contexts (Mahmood, Arshad, Khan, Afzal, & Bashir, 2024). These developments underscore the importance of reframing investor behavior through both cognitive and educational lenses to reflect the evolving realities of modern financial decision-making.

Investor behavior research has historically developed along two parallel tracks: the study of financial literacy as an enabling factor for sound financial decision-making and the study of behavioral biases as cognitive distortions that hinder optimal outcomes. The research problem lies in the insufficient integration of these perspectives—how financial literacy and psychological biases interact in shaping real-world investment decisions remains theoretically and empirically fragmented.

This fragmentation is significant in light of modern investment environments characterized by increasing complexity, accessibility, and volatility. With the rise of cryptocurrency, decentralized finance, and algorithmic trading platforms, individual investors face new opportunities and risks. Surveys reveal that financial literacy is low among younger individuals; fewer than one-third of young adults possess basic knowledge of interest rates, inflation, and risk diversification (Lusardi, Mitchell, & Curto, 2010). Despite this, many remain highly exposed to complex or speculative financial instruments (Lusardi & Mitchell, 2014). Simultaneously, the effects of cognitive biases such as overconfidence, loss aversion, and herding continue to influence investor outcomes (Barber & Odean 2001; Bikhchandani, Hirshleifer, & Welch, 1992; Kahneman & Tversky, 1979). Without a comprehensive framework that considers both knowledge and cognition, efforts to improve financial decision-making may remain suboptimal.

Recent empirical studies have emphasized that financial literacy not only enhances knowledge but also plays a critical moderating role in mitigating the effects of behavioral biases on investment decisions. For instance, Mahmood, Arshad, Khan, Afzal, & Bashir (2024) demonstrated that higher levels of financial literacy significantly reduce the influence of overconfidence, herding, and anchoring, particularly among retail investors in emerging markets. Similarly, Van Rooij, Lusardi, & Alessie (2011) showed that financially literate individuals are significantly more likely to participate in the stock market, suggesting that financial knowledge may help individuals overcome inertia and bias-related barriers to investment. These findings reinforce the importance of integrating financial education with behavioral awareness—highlighting that knowledge alone is insufficient unless accompanied by strategies that directly address cognitive distortions.

To address this gap, the present study employs a bibliometric approach to systematically map the literature at the intersection of financial literacy and behavioral finance. By examining 1,000 journal articles published between 2014 and 2025, sourced from CrossRef via Publish or Perish, and visualized using VOSviewer, we aim to identify research clusters, temporal trends, and conceptual hotspots that define the current state of the field.

We operate under several key assumptions: (1) co-occurrence of author keywords reflects thematic proximity; (2) CrossRef offers sufficient coverage of relevant publications; (3) VOSviewer's clustering algorithm reliably reveals underlying intellectual structures; and (4) recent publication years indicate emerging topics deserving future exploration.

The analysis is grounded in several theoretical frameworks. Behavioral finance and Prospect Theory explain how cognitive biases distort rational investment behavior (Kahneman & Tversky, 1979). Human Capital Theory posits that increased financial knowledge enhances decision quality (Lusardi & Mitchell, 2014). The Theory of Planned Behavior links knowledge and attitudes to financial intentions (Ajzen, 1991), while the Behavioral Life-Cycle Hypothesis examines how psychological biases can interfere with intended financial behavior even among the informed (Shefrin & Thaler, 1988).

We anticipated identifying separate but increasingly overlapping clusters in the literature. The actual results confirm a maturing integration: distinct streams still exist, but co-linkages between literacy and bias themes are strengthening—especially in the context of digital finance and Gen Z investors. However, conceptual and methodological gaps persist.

The remainder of this article proceeds as follows: Section 2 details the research method. Section 3 presents the bibliometric results and discusses theoretical and methodological implications. Section 5 offers concluding remarks and future research directions.

2. Research Method

This study employs a quantitative exploratory bibliometric design to explore the intellectual structure and thematic development of research on financial literacy and behavioral biases in investor behavior. The data were collected using Publish or Perish (PoP) version 8, accessing the

CrossRef database. A total of eight keyword combinations were used, including “financial literacy” and “investment decision,” “behavioral finance” and “overconfidence,” and “behavioral bias” and “financial decision-making.” The search was restricted to peer-reviewed journal articles published between 2014 and 2025.

An initial dataset of several thousand records was retrieved. To obtain a representative and thematically coherent sample, a multi-stage selection process was conducted. This process involved removing duplicates, applying inclusion criteria (English language, indexed in CrossRef, and relevant terms in the title, abstract, or keywords), and enforcing exclusion criteria (non-academic materials, such as conference proceedings, theses, and book chapters). Each article was manually screened for relevance to the themes of financial literacy, behavioral biases, and investment behavior. As a result of this structured screening, a total of 1,000 peer-reviewed journal articles were selected for analysis; the articles were not sampled using probabilistic methods; instead, purposive bibliometric sampling was applied based on metadata relevance and thematic alignment (Massaro, Dumay, & Guthrie, 2016).

Bibliometric analysis has emerged as a robust and transparent method for mapping the intellectual structure of scientific fields, particularly those that intersect behavioral finance and investor psychology. This method has also been validated through comparative studies across diverse scientific domains, highlighting its versatility and credibility in capturing thematic structures (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2011; Merigó & Yang, 2017). As outlined by Aria & Cuccurullo (2017), bibliometric tools such as VOSviewer and Publish or Perish enable researchers to systematically identify thematic clusters, keyword trends, and co-authorship networks from large bibliographic datasets. Zupic & Čater (2015) further emphasize that bibliometric approaches ensure methodological rigor through a structured workflow, ranging from data collection to visualization and interpretation, thereby enhancing both replicability and analytical depth. These tools are, therefore, widely recognized in high-quality research for supporting evidence-based insights and strategic knowledge development.

The bibliographic metadata, including titles, abstracts, keywords, author information, and publication years, were exported in RIS format and processed using VOSviewer. This analysis generated three key visualizations: (1) a Network Visualization showing keyword co-occurrence patterns with a minimum threshold of 10 occurrences per term, (2) an Overlay Visualization mapping average publication years of keywords to examine thematic evolution over time, and (3) a Density Visualization indicating the frequency and prominence of terms in the literature. Complete counting was used as the counting method, and clustering was performed with VOSviewer’s default modularity algorithm. The validity of the analysis was ensured through a carefully constructed keyword query strategy, manual relevance screening, and a transparent inclusion-exclusion process. Since the study analyzes secondary data from published research and does not involve human participants or primary data collection, no ethical clearance was required. The research adheres to the established norms of bibliometric studies, as outlined by Donthu, Kumar, Mukherjee, Pandey, & Lim (2021) and van Eck & Waltman (2010), and meets internal reliability standards by applying consistent analytical parameters throughout the process.

3. Results and Discussions

This study identified thematic structures and intellectual trends in the field of investor behavior by analyzing 1,000 peer-reviewed journal articles published from 2014 to 2025. Three types of bibliometric visualizations were used: network visualization, overlay visualization, and density visualization, all generated using VOSviewer. The following sections elaborate the findings and interpret them in the context of recent literature.

Network Visualization Results: Thematic Clustering

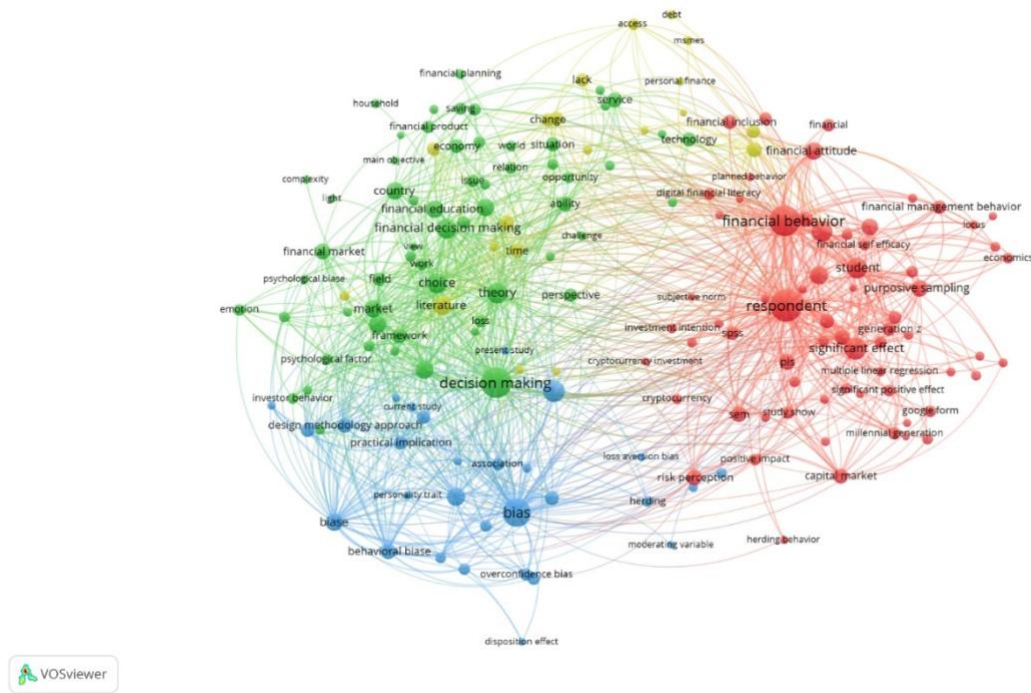


Figure 1. Network visualization of keyword co-occurrence from 1,000 articles (2014–2025)

The network visualization revealed four distinct thematic clusters:

- Cluster 1: Financial Literacy and Decision-Making (Green Cluster)**
 This cluster includes terms such as "financial decision making," "financial product," "financial education," and "financial planning." It emphasizes the foundational role of financial literacy in shaping rational investor decisions. It aligns with the Theory of Planned Behavior (TPB), where financial capability is a precursor to behavioral intention.
- Cluster 2: Behavioral Biases in Investor Psychology (Blue Cluster)**
 Terms such as "overconfidence," "loss aversion," "herding," and "anchoring bias" dominate this cluster. These studies contribute to the understanding of how heuristic-based biases impact investment decisions, grounded in Prospect Theory and Behavioral Finance frameworks.
- Cluster 3: Digitalization and Financial Inclusion (Yellow Cluster)**
 This emerging cluster centers on terms such as "cryptocurrency," "mobile trading," and "Gen Z." It reflects the digital shift in financial services and its intersection with investor behavior, particularly among younger demographics.
- Cluster 4: Empirical Methods and Survey Instruments (Red Cluster)**
 Includes keywords such as "PLS-SEM," "questionnaire," and "student sample." This cluster highlights the methodological approaches commonly employed in the literature, showing a tendency toward structural equation modeling and experimental designs.

These four clusters represent the intellectual foundation of the field, indicating that contemporary investor behavior research is increasingly interdisciplinary, combining psychology, economics, and digital technology.

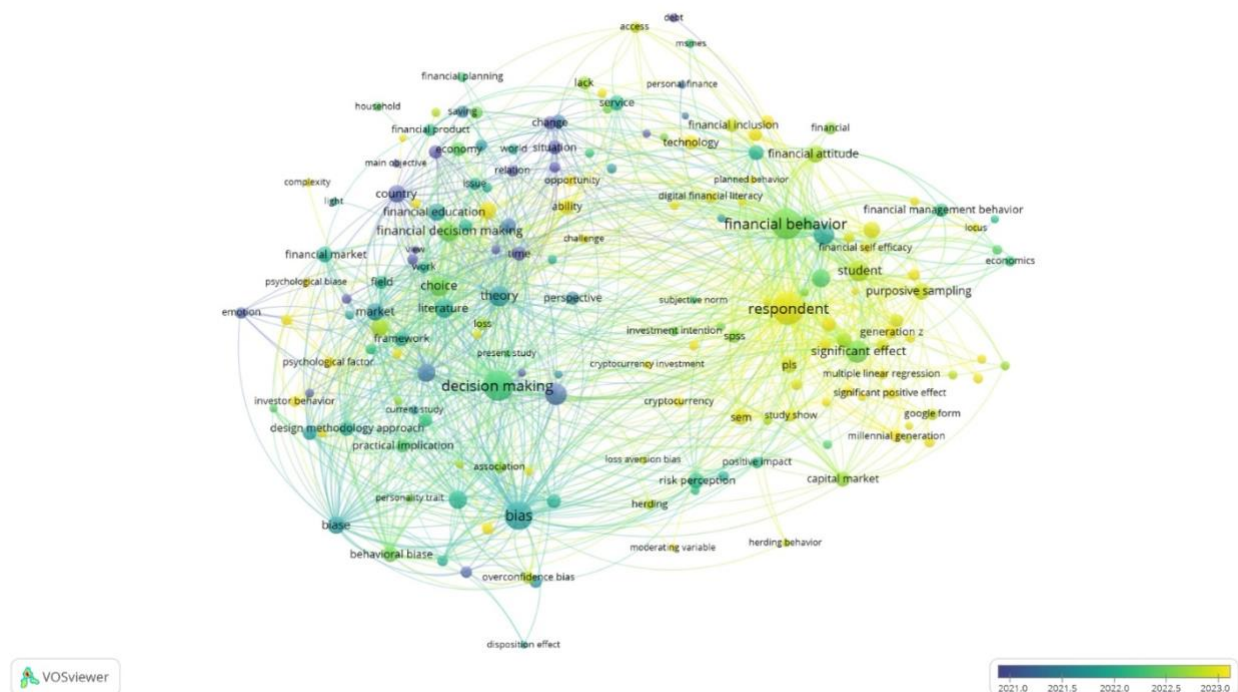
Table 1. Representative Keywords and Themes by Cluster

Cluster	Representative Keywords	Main Theme
1	financial literacy, financial education, investment intention	Literacy-based decision making
2	overconfidence, loss aversion, herding, anchoring	Behavioral biases in investing
3	cryptocurrency, mobile trading, fintech, Gen Z	Digital and generational finance
4	SEM, questionnaire, student sample	Empirical methods in behavioral finance

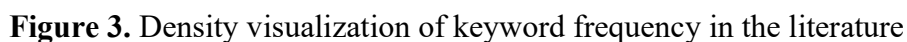
Table 1 summarizes the representative keywords and thematic focus of each cluster described above.

Overlay Visualization Results: Temporal Trends

The overlay visualization provided insights into the evolution of research over time. Older themes (2014–2017) centered around traditional behavioral finance concepts such as overconfidence and loss aversion. In contrast, more recent publications (2020–2025) are increasingly focused on digital finance, cryptocurrency literacy, and the investment behavior of Gen Z and millennials. The temporal shift indicates a growing scholarly interest in how digital transformation influences behavioral tendencies in financial decision-making.

**Figure 2.** Overlay visualization showing temporal evolution of keywords (2014–2025)

The density visualization showed that high-frequency terms include "financial literacy," "investment decision," and "behavioral bias," indicating their central role in the discourse. This visualization also revealed emerging hotspots such as "crypto investment," "risk perception," and "financial inclusion," suggesting new directions for future research. These concentrations underscore the increasing complexity of investor behavior, particularly in under digital and uncertain environments.



Building on the integrated results of network, overlay, and density visualizations, this study presents a conceptual thematic framework (see Figure 4) that synthesizes the significant domains of investor behavior research. The framework positions financial literacy, psychological biases, investment decision-making, and digitalization/demographic moderators as key interconnected constructs. At the base lies financial literacy, which encompasses knowledge, education, and planning. As anchored in the bibliometric principle, financial literacy remains a dominant theme in investor behavior studies (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). This aligns with longstanding theories on human capital and planned behavior, affirming its foundational role in these theories.

The domain of behavioral biases—including overconfidence, loss aversion, herding, and anchoring—intervenes between literacy and decision-making, underscoring the importance of Prospect Theory and Behavioral Finance frameworks. Biases shape how knowledge is interpreted and applied in investment actions. Investment decision-making emerges as the primary outcome, influenced by both literacy and bias pathways, which are evident across multiple clusters. The

model integrates this dual influence to reflect the complexity of actual investment behavior. Overlaying these relationships are digital and demographic moderators, especially Gen Z investors in cryptocurrency and fintech contexts. Recent studies confirm that digital financial literacy—a critical factor for informed participation in cryptocurrency—has become increasingly relevant (Kumari, Bala, & Chakraborty, 2023). Such digitally savvy cohorts exhibit new behavioral patterns in investment decision-making (Wang, Duong, Ying, & Chang, 2024).

Recent empirical studies further reinforce the conceptual structure proposed in this study. Contemporary evidence suggests that digital behavioral environments—particularly fintech, cryptocurrency, and social media platforms—are increasingly shaping how investors process information and make financial decisions. Aftab, Fazal, & Andleeb (2025) demonstrated that behavioral biases such as anchoring and overconfidence significantly hinder fintech adoption, while financial literacy moderates these effects by facilitating better adaptation. Likewise, Li, He, & Shi (2023) found that representativeness and conservatism biases continue to distort risk perceptions even in mature digital markets. Kumari, Bala, & Chakraborty (2023) emphasized that digital financial literacy and personal autonomy are essential enablers of financial well-being in complex environments. Additional insights from Hasanah, Koesrindartoto, Wiryono, & Angelica (2025) revealed that the perceived characteristics and social trust toward financial influencers (finfluencers) play a critical role in shaping Gen Z’s financial decision-making, particularly in highly social media-driven contexts.

Thus, the integration of financial literacy, behavioral biases, and digital-demographic contexts has become indispensable in explaining contemporary investor behavior. These findings not only strengthen the internal coherence of the framework but also underscore the importance of recognizing emerging digital and generational dynamics as key determinants within the modern financial landscape.

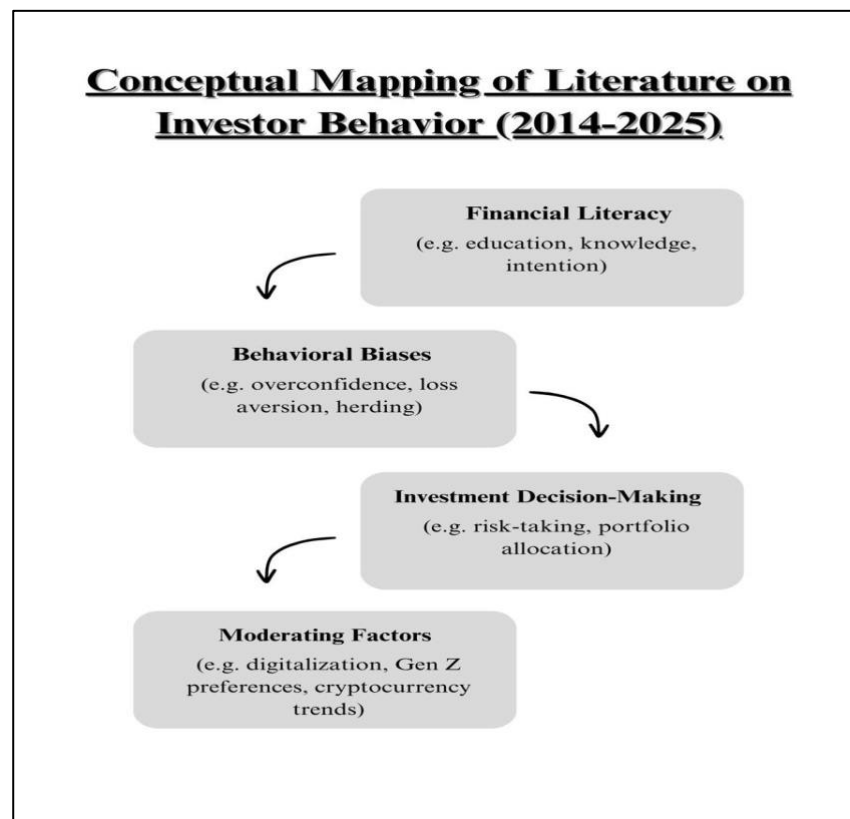


Figure 4. Conceptual mapping of literature on investor behavior (2014–2025)

This study contributes to the field by offering:

1. An integrative framework that captures the multidimensional structure of investor behavior.
2. Identification of underexplored intersections, particularly the moderating role of digital context on biases—such as how literacy and herding affect Gen Z crypto investors.
3. A structured roadmap for future research that builds on both traditional and emergent themes in behavioral finance and financial technology.

By bridging psychological, educational, and digital themes, this conceptual mapping provides a robust foundation for both theoretical development and empirical validation within a rapidly evolving investment landscape.

4. Conclusions

This study aimed to investigate the intellectual structure and thematic development of research on investor behavior by conducting a bibliometric analysis of 1,000 articles published between 2014 and 2025. The primary objective was to identify how financial literacy and psychological biases are discussed in the literature and how they are positioned about investment decision-making. Through network visualization, the study identified four main clusters: financial literacy and decision-making, behavioral biases in investor behavior, financial innovation and digitalization, and methodological approaches. The overlay visualization demonstrated the temporal evolution of research themes, showing a clear transition from foundational psychological constructs to more contemporary issues such as cryptocurrency and Gen Z behavior. The density visualization further highlighted the most influential keywords and emerging research hotspots in the field.

This research concludes that investor behavior is shaped by an interplay of literacy, cognitive biases, and technological developments in the context. Financial literacy continues to serve as a core competency that influences investment actions, while behavioral biases persist as significant factors affecting rationality. In addition, the increasing role of digital platforms, mobile trading, and financial technologies is transforming how investment behavior manifests, particularly among younger, tech-savvy generations.

The study contributes to the literature by providing a conceptual mapping that integrates the psychological, financial, and digital dimensions of investor behavior. This framework not only reflects the current state of research but also provides direction for future empirical studies.

However, this study is limited to keyword-based bibliometric analysis, which may not capture the full depth of each article's conceptual contribution. Additionally, relying solely on the CrossRef database might introduce potential bias by including articles from journals with varying reputations and quality standards. Future research is encouraged to complement bibliometric methods with qualitative content analysis or full-text semantic mapping to enhance the understanding of the research landscape. Further exploration of cross-cultural investor behavior, as well as the psychological impact of emerging technologies, would also enhance understanding in this rapidly evolving field.

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