



Advance Journal of Econometrics and Finance



Online ISSN

2959-8990

Print ISSN

2959-8982

<https://ajeaf.com/index.php/Journal/About>

Name of Publisher: SCHOLAR CRAFT EDUCATION & RESEARCH HUB

Review Type: Double Blind Peer Review

Journal Frequency: Quarterly Research Journal

Cognitive and Emotional Drivers of Real-Time Investment Decision Behavior: Evidence from Digital Investors

Umar Hayat^{*1}, Ume Roman², Zainab Kausar Khan³, Mehak Ali⁴

<p>Umar Hayat* Department of Business Administration, City College (UNIVERSITY CAMPUS), Multan. Email: umarhayatrehmani786@gmail.com</p> <p>Ume Roman BS (Psychology), Department of Psychology, City College (UNIVERSITY CAMPUS), Multan. Email: umeroman12888@gmail.com</p> <p>Zainab Kausar Khan Department of Psychology, City College (UNIVERSITY CAMPUS), Multan Email: zainabkhank520@gmail.com</p> <p>Mehak Ali (PhD Scholar), NCBA & E (Al- Hamra) University, Multan Campus, Lahore Email: mehk.ali3030@gmail.com</p>	<p>Abstract</p> <p>This study examines the mechanisms by which emotional triggers and cognitive load affect real-time investment decisions in digital financial scenarios. In addition, this study focuses at how risk tolerance affects the association between emotional triggers and decision-making and how financial literacy moderates the relationship between cognitive overload and financial decision-making. Data were collected through an online structured questionnaire from 385 active digital investors and analyzed using SmartPLS 4.0 through PLS-SEM. This involved assessing the structural model (path coefficients, bootstrapping, and moderation analysis using the two-stage approach) and the measurement model (reliability, convergent validity, discriminant validity). The findings indicate that cognitive load has a significant positive effect on real-time investment decision behavior, demonstrating that investors under digital market pressure and mental overload are predisposed to execute rapid, heuristic-driven trades rather than engage in systematic evaluation ($\beta = 0.324, p < 0.001$). There is also a considerable positive impact of emotional triggers ($\beta = 0.387, p < 0.001$). Higher financial literacy lessens the impact of cognitive overload by negatively moderating the link between cognitive load and real-time investment decisions ($\beta = -0.215, p < 0.001$). The association between emotional triggers and real-time investing decisions is adversely moderated by risk tolerance ($\beta = -0.187, p < 0.001$), indicating that investors with higher risk tolerance are less sensitive to emotional stimuli. The model demonstrates considerable predictive relevance ($Q^2 = 0.312$) and corresponds to 48.7% of the variance in real-time investment decisions ($R^2 = 0.487$). By highlighting empirical data from real digital investors, This study contributes to the neurofinance and behavioral finance literature by showing how individual differences (risk tolerance and financial literacy) interact with cognitive and emotional factors affecting real-time decisions. It empowers governing bodies, financial advisors, and platform designers with practical advice.</p>
<p>Keywords:</p>	<p>Neurofinance, Cognitive Load, Emotional Triggers, Real-time Investment Decisions, Financial Literacy, Risk Tolerance, Digital Financial Environment</p>

1. Introduction

1.1 Background of Neurofinance and Digital Transformation

Neurofinance provides a biological and cognitive basis for these deviations, as it demonstrates that investment decisions are not just analytical, but that emotional and cognitive processes, which are subconscious, play a significant role in them (Tom et al., 2007; Loewenstein et al., 2001). Meanwhile, the digitization of financial services has transformed the investment world. The online trading platform, mobile investment apps, real time financial alerts, social media feeds of financial information and AI-based trading tools have made the market more accessible for investors but are more mentally challenging than ever before (Barber & Odean, 2001; Othman et al., 2026). The global online trading platform market is expected to grow to \$18.4 billion by 2031, due to the growing rate of retail investors and the use of AI in trading platforms, mobile trading, and other factors. Within this digital financial environment investors are inundated with continuous flows of real time data, experience fast price movements and have the ability to instantaneously execute trades, all of which pose high cognitive challenges to them and often elicit strong emotional reactions. (Shiller, 2015; Hsu et al., 2021).

1.2 Problem Statement and Research Gaps

Even though digital investment platforms are becoming more and more common, there are still a lot of unanswered questions about how emotional triggers and cognitive load interact to influence real-time investment decisions. First, the majority of neurofinance research has been carried out in controlled laboratory conditions with simplified choice tasks, which restricts the applicability of results to intricate, dynamic digital environments (Kumar & Goel, 2025). Second, rather than examining the combined and interaction impacts of cognitive load and emotional triggers on real-time decision making, previous research has generally focused on these factors separately (Aktar & Tekşen, 2026; Ganzach et al., 2026). Third, there hasn't been enough focus on the moderating mechanisms of risk tolerance and financial literacy in the context of real-time digital investment, especially how these individual difference variables either mitigate or intensify the effects of cognitive and emotional aspects. Fourth, there are few empirical investigations that test integrated models of neurofinance in ecologically valid digital situations using rigorous quantitative techniques as PLS SEM (Hair et al., 2022).

With 507 papers examined, recent systematic reviews have found a rising trend in neuroeconomics and neurofinance publications; however, the majority of these articles concentrate on lab experiments rather than field research of real digital investors (Kumar & Goel, 2025). The necessity for additional psychologically informed methods to comprehend market behavior in dynamic and complicated developing financial contexts is further highlighted by a thorough literature analysis of behavioral finance (Wu, 2025). Additionally, new research shows that information overload is viewed as cognitive strain linked to analytical paralysis and perceived changes in decision quality (Aktar & Tekşen, 2026), and that cognitive load enhances risk-taking behavior in financial tasks. However, little is known about how risk tolerance and financial literacy mitigate these consequences in real-time digital environments.

1.3 Research Objectives and Questions

This study addresses the identified gaps through the following objectives:

- 1.—To examine the influence of cognitive load on real-time investment decisions in digital financial environments.
- 2.—To examine the influence of emotional triggers on real-time investment decisions in digital financial environments.
- 3.—To investigate the moderating role of financial literacy on the relationship between cognitive load and real-time investment decisions.
- 4.—To investigate the moderating role of risk tolerance on the relationship between emotional triggers and real-time investment decisions.

1.4 Significance and Contribution of the Study

The present study makes several important contributions: From a theoretical point of view, it contributes to the neurofinance literature through the inclusion of field supported evidence from real digital investors, thus extending laboratory findings to ecologically valid contexts. It combines dual process theory (Kahneman, 2011; Evans, 2008) with individual difference variables (financial literacy as well as risk tolerance) in an effort to explain real time investment behavior. Empirically, it offers PLS SEM evidence from 385 digital investors with rigorous measurement and structural framework assessment including moderation analysis with the two-phase approach. Methodologically, it shows how to apply SmartPLS 4.0 to test complex interaction impacts in digital finance research. The findings have practical implications for investors, financial consultants, online trading platforms, policy makers, financial education programs and digital investment app designers in enhancing sound judgment and investor protection in digital environments.

2. Literature Review

2.1 Neurofinance and Investor Decision-Making

Neurofinance is an interdisciplinary field that investigates the neurological foundations of financial decisions (Peterson, 2007). Early neuroimaging studies have shown that financial decision making engages both cognitive areas (prefrontal cortical cortex) as well as emotional regions (Camerer et al., 2005). Anticipation of gains activates reward related neural circuits whereas anticipation of losses activates pain related circuits (Tom et al., 2007). The phenomenon of loss aversion, or feeling losses more strongly than equivalent gains, has been linked with asymmetric activation in the amygdala and insula (Kahneman & Tversky, 1979; Tom et al., 2007). The results provide biological confirmation for the behavioral abnormalities documented in the theory of prospect.

Recent research has explored the role of certain neurotransmitters in the behavioral biases of retail investors, furthering the discussion between neurofinance and behavioral finance. The neuroeconomics and neurofinance fields have seen substantial growth and thematic clustering, according to a systematic and bibliometric review of 507 articles. Emerging themes include risk perception, decision making under uncertainty, and the role of emotions in financial choices (Kumar & Goel, 2025). The neurophysiological methods are becoming the core analytical tools in research on international financial management and accounting, moving away from peripheral methodological novelty. Neurofinance describes the causes of investors' behavior recorded in behavioral finance and describes the neuroscientific impact of genetics, endocrinal factors, and health/brain issues on risk return perception and asset valuations (Durham University, 2025).

2.2 Cognitive Load in Digital Financial Decision-Making

The amount of mental work required to digest information and finish a task is known as cognitive load. Performance deteriorates when task demands surpass the very restricted working memory capacity (Sweller, 1988). Cognitive load in digital financial environments comes from a variety of sources, such as real time price feeds, news alerts, social media sentiment, charting tools and the need to conduct trades quickly (Barber & Odean, 2001; Hsu et al., 2021). The increased cognitive load caused by stress diminishes the bandwidth for processing complex information, leaving financial decisions impulsive and less thoughtful.

A complete theoretical framework for comprehending the cognitive load in financial markets differentiates among attention allocation and cognitive processing capacity, and shows how the constraints interact to produce differential effects among types of investors (Du & Tang, 2025). The study provided evidence for three specific mechanisms: selective attention, processing errors, and strategic complexity.

The experiment was a game-like investment experiment in individuals, groups and gender heterogeneous groups, half of them under cognitive load. Investors exhibit biased or emotionally driven judgments when under high cognitive load. Information overload is perceived as cognitive strain that could delay decision processes, be linked to analysis paralysis and apparent changes in judgment quality, and be associated with more uncertainty and potential difficulties in interpreting risk, according to research looking at institutional investors' perspectives and drawing on bounded rationality and cognitive load theory (Aktar & Tekşen, 2026). These results offer preliminary understanding of how information density could affect portfolio evaluation and risk interpretation.

Financial confidence and decision-making within user decision fatigue are directly impacted by option overload, sometimes referred to as overchoice. For financial apps, regulatory agencies are implementing UX stress testing measures that gauge user comprehension, focus time, and error rates. Instead of ignoring financial decisions due to the overwhelming quantity of options, people can reduce cognitive load and stress by pausing and implementing ways to simplify choices. Although classifying money into distinct mental "accounts," or mental accounting, can lessen cognitive strain, it may also result in less-than-ideal financial judgments.

2.3 Investment Decisions Affected by Emotions

According to Slovic, Finucane, Peters, and MacGregor (2007), emotional triggers are stimuli that elicit affective reactions that can impact decision-making processes. Market volatility, fear of loss, greed, and FOMO are prominent emotional triggers in digital financial systems (Loewenstein et al., 2001). Market cycles produce predictable emotional investing patterns: confidence rises and risk tolerance increases during bull markets, while fear and worry rule during bear markets, leading investors to give up on investment plans just when discipline is most important. Investors can maintain composure and make rational judgments by being aware of the emotional triggers and cognitive biases associated with volatility.

The use of instincts and intuition to guide decisions, particularly in uncertain situations, is known as the affect heuristic. This heuristic has a big impact on investment decisions. Overly optimistic appraisals of possible profits and underestimations of hazards might result from positive feelings for a specific company or market trend. According to recent studies, risk and return assessments are impacted by both the affect heuristic and an ecologically valid heuristic known as the risk-return heuristic, which results in a positive association between risk and return (Ganzach et al., 2026). Participants' familiarity with financial markets is correlated with their propensity to depend on this heuristic. The study advances knowledge of ecological rationality, competing heuristics, and the connection between risk perception and financial literacy (Ganzach et al., 2026).

The two main emotional factors influencing investment behavior are fear and greed (Hennion & Walsh, 2025). Because every loss jeopardizes financial stability rather than acting as straightforward feedback, trading with personal capital intensifies every emotional trigger. Financial planning aids in the early detection of emotional triggers and helps clients return to their goal. Establishing a cooling-off interval enables rational analysis to resume and emotions to fade. Numerous emotional triggers can be avoided by automated decisions such dollar cost averaging (Hennion & Walsh, 2025). Knee jerk reactions can be decreased by limiting news intake by establishing limits on how frequently investors check their portfolios or financial news (Hennion & Walsh, 2025). A trade review system fosters accountability and encourages ongoing education. Maintaining discipline can be aided by identifying particular emotional triggers, such as the degree of market loss that causes panic, and by using minor market corrections as practice chances to monitor emotional reactions without taking action.

2.4 Real-Time Investment Decisions

Investment decisions made in response to current market conditions, real-time data feeds, and time-sensitive information are referred to as real-time investment decisions (Shiller, 2015). Real-time investment decisions necessitate quick decision-making, fast information processing, and prompt action, in contrast to traditional investment decisions that permit prolonged discussion. Investors now have to make judgments more quickly due to the growth of algorithmic trading, mobile trading apps, and high-frequency trading (Barber & Odean, 2001)

With features like instructional modules, AI-driven risk assessments, and hybrid advisory services that promote informed decision making and long-term investor participation, digital investment platforms have democratized finance (Othman et al., 2026). Increased investor interest, technological developments, and favorable legal conditions are driving the significant rise of crowd investing markets.

Due to the quick uptake of cryptocurrencies, retail investors are increasingly making judgments based on heuristic or emotional biases rather than logical analysis, which has created behavioral and psychological problems (Kala et al., 2025). Market volatility is still very high, and when liquidity extremes occur, the prices of digital assets can fluctuate in tandem with stocks. Policymakers have cautioned against making investment decisions based on social media marketing or exaggerated promises of guaranteed returns, noting that thousands of customers have already fallen victim to fraudulent operations (CSO Pakistan, 2026). The marketing of fraudulent investment schemes on social media platforms has prompted regulatory warnings, underscoring the importance of protecting investors in the digital space (PTA, 2026).

2.5 Moderating Effect of Financial Literacy

Understanding fundamental financial concepts (such as risk diversification, compounding, and inflation) and having the self-assurance to use that understanding when making financial decisions are both components of financial literacy (Lusardi & Mitchell, 2014). According to human capital theory (Becker, 1964), financial literacy is a type of human capital that improves productivity and decision quality. Financially literate people are more likely to identify when they are feeling cognitive overload, have more effective cognitive schemas for processing financial information, and require less working memory for everyday judgments (Lusardi & Mitchell, 2014). An investor with solid financial understanding may make better financial decisions, and financial literacy is a crucial part of making profitable financial decisions connected to investments.

Research has examined how financial literacy mitigates the influence of heuristic-driven biases on irrational investment practices (Sadeeq, 2026). The study found that heuristic-driven biases positively affect irrationality in investment decision making, i.e., greater biases are linked to more irrational conclusions. Financial literacy does not always assist investors in reducing the influence of biases on their decision-making, as the moderating effect of financial literacy was not shown to be significant in that specific relationship. This is particularly true if investors lack investment-related financial literacy but are adept at the fundamental level of financial literacy (Sadeeq, 2026).

While making investing decisions, an elevated level of financial literacy acts as an essential buffer that substantially mitigates the adverse effects of cognitive and emotional biases. According to other research, behavioral biases have a significant direct and indirect impact on investment decisions through perceptions of risk. By emphasizing the significance of financial literacy in reducing biased investment behavior, these findings advance the area of behavioral finance and offer insightful information to regulators, legislators, and financial educators (Discover Psychology, 2026).

The impact of behavioral biases on investing decision-making has also been studied, with a focus on the moderating effect of financial literacy among institutional and individual investors. The results show that behavioral biases have a significant impact on investment behavior, with notable variances among individual and institutional investors. These effects were found to be moderated by financial literacy, indicating that investors with greater financial knowledge are better able to make logical investment decisions (Muhammad, 2025).

Financial literacy strongly influences investment decisions among retail investors, according to studies examining the impact of financial literacy on investment decisions and determining the moderating role of behavioral biases, with income level and risk tolerance included as control variables. Additionally, studies have looked at the relationship between digital and behavioral financial literacy and investing decisions, explaining these decisions within the framework of planned behavior by utilizing social effect and financial status. (Repec, 2026).

2.6 Tolerance for Risk as a Moderator

Risk tolerance is the willingness to accept financial uncertainty and potential losses in pursuit of higher returns (Grable, 2000). High risk tolerance is associated with greater emotional stability, lower financial anxiety, and higher confidence in decision-making under uncertainty (Grable & Joo, 2004). Recent empirical research has examined the predictive role of optimism and financial security towards shaping the investment behavior of retail investors, with results revealing that both optimism and financial security have significant positive impact and association with investment activities, risk tolerance, and long-term financial planning (JSRD, 2025). Study of financial risk tolerance, financial knowledge, and investment behaviors has been conducted among millennials to understand how financial knowledge and risk tolerance affect financial investment behavior (KCI, 2025).

Research on financial literacy and experienced regret on Gen Z investment decisions has identified risk tolerance as a mediating variable, with findings showing that financial literacy and experienced regret significantly influence risk tolerance, and risk tolerance also significantly influences investment decisions (Journal UNTAR, 2025). The mediation analysis results show that risk tolerance can mediate the influence of financial literacy and experienced regret on investment decisions (Journal UNTAR, 2025).

The relationship between risk tolerance and financial investment decision-making has been studied; data from the US indicates that people with higher risk tolerance made more investments in less hazardous securities, while those with lower risk tolerance made fewer investments in riskier stocks and more in safer government securities (Sciprofiles, 2025). Research has examined the influence of financial self-efficacy and peer influence on Gen Z financial asset investment decisions with risk tolerance as a moderating variable, amidst low financial literacy (38%) and the dominance of young investors (IAIN Palopo, 2026). In order to investigate the moderating effect of risk tolerance in the relationship between investment strategy and sustainable investments, a conceptual model was created.

Studies on the influence of behavioral bias on investment decisions among pension fund administrators have found that both status-quo bias and disposition effect significantly influence investment decisions, often leading to sub-optimal outcomes, with risk tolerance significantly mediating these effects, indicating that pension fund administrators with higher risk tolerance are more likely to counteract these behavioral tendencies (Ijeti, 2026). Research on how financial behavior and Fear of Missing Out (FOMO) influence Generation Z's investment decisions with risk tolerance as a moderating variable has concluded that risk tolerance plays a critical mediating role in shaping Gen Z's investment decisions (Journal UNJ, 2026). Results of IAIN Palopo, (2026) indicated that love of money, risk tolerance, and fintech utilization have a positive and significant effect on investment interest among accounting students.

2.7 Digital Financial Environment as Research Context

The digital financial environment encompasses the technological, informational, and social context within which modern investment decisions are made. This environment includes online brokerage platforms, mobile trading applications, real-time financial data feeds, algorithmic trading tools, social media financial communities, and robo-advisory services (Barber & Odean, 2001; Othman et al., 2026). The role of social media influencers in shaping investment decisions has attracted increasing attention on the digital edge, with research employing the uses and gratifications theory as the theoretical framework and investigating the moderating role of financial literacy. In the first half of 2025, global fintech investment in the digital assets and currencies industry was USD 8.4 billion, compared to USD 10.7 billion for the full year of 2024 (KPMG, 2025). The use of central bank digital currencies (CBDCs), the use of distributed ledger technology by financial institutions, and new legislation are all anticipated to rise sharply (Lombard Odier, 2025). Responsible platform architecture that reduces mental strain and regulates emotional triggers is essential for market stability and investor safety.

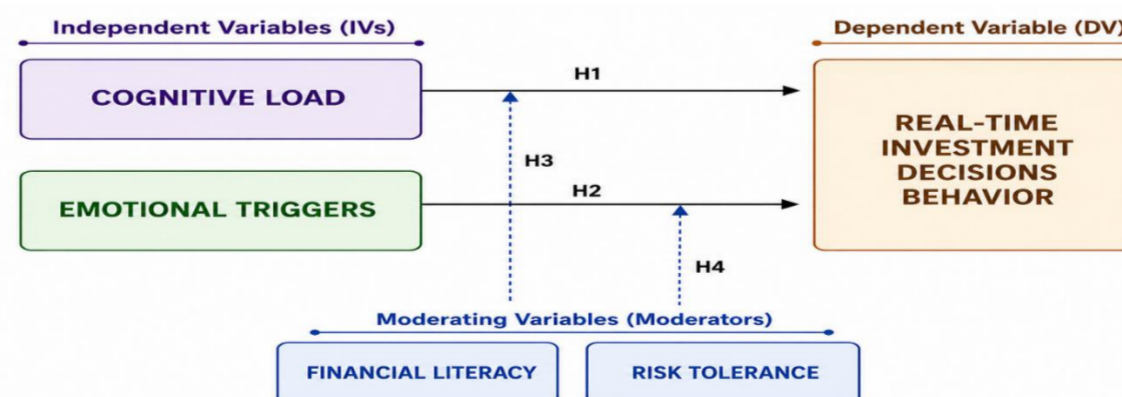
3. Theoretical Framework

This study is grounded in **dual-process theory**; however, **Cognitive Load Theory** and **Affect Heuristic Theory** are supporting theories, as originally articulated by Kahneman (2011) and Evans (2008). Dual process theory suggests that human cognition is based on two different but related systems. System 1 is fast, naturalistic, straightforward, unspoken, associated, and emotionally charged. It operates far from our conscious awareness, doesn't involve working memory resources, and is exceedingly susceptible to cognitive biases and behavioral heuristics. **System 2** is slow, controlled, effortful, deliberate, analytical, and rule-based. It requires conscious attention, draws heavily on working memory capacity, and is responsible for logical reasoning, systematic analysis, and overriding impulsive responses from System 1.

In the context of investment decisions, System 1 processes generate rapid intuitive judgments about whether to buy, sell, or hold based on immediate emotional reactions, simple heuristics (e.g., affect heuristic, representativeness), and salient information (e.g., recent price movements). System 2 processes evaluate these intuitive judgments, override them when they are inconsistent with rational analysis, and engage in systematic evaluation of investment alternatives, risk assessment, and portfolio rebalancing. However, System 2 is inherently "lazy" and easily depleted; under conditions of high cognitive load, time pressure, or emotional arousal, System 2 capacity is compromised, and System 1 dominates decision-making (Kahneman, 2011). The digital financial environment creates conditions that strongly favor System 1 processing. This study operationalizes **cognitive load** as a factor that impairs System 2 processing and **emotional triggers** as factors that directly activate System 1 processing.

Furthermore, individual difference variables can moderate the balance between System 1 and System 2. **Financial literacy** enhances the efficiency of System 2 processing; financially literate individuals have more elaborate and they have more structured cognitive schemas for financial knowledge, need less working memory to make routine financial decisions, and are more likely to identify cognitive overload and use compensatory techniques (Lusardi & Mitchell, 2014; Becker, 1964). Therefore, it is too expected that financial literacy will minimize the effect of cognitive burden on decisions made in real time (negative moderation). **Risk tolerance** influences emotional reactivity; individuals with high risk tolerance experience less intense emotional arousal from market volatility and potential losses, have higher emotional stability, and are less likely to have their System 2 processing disrupted by emotional triggers (Grable, 2000; Grable & Joo, 2004). Thus, risk tolerance is hypothesized to decrease the effect of emotional triggers on real-time decisions (negative moderation).

Although this study is theoretically informed by neurofinance, it does not directly measure neural responses; rather, it examines cognitive and emotional mechanisms through self-reported behavioral indicators in digital investment contexts.



The conceptual framework



4.—Hypotheses Development

H1: Cognitive load has a significant positive effect on real-time investment decision-making behavior in digital financial environments.

H2: Emotional triggers have a significant positive effect on real-time investment decision-making behavior in digital financial environments.

H3: Financial literacy negatively moderates the relationship between cognitive load and real-time investment decision-making behavior, such that the relationship becomes weaker when financial literacy is high.

H4: Risk tolerance negatively moderates the relationship between emotional triggers and real-time investment decision-making behavior, such that the relationship becomes weaker when risk tolerance is high.

5. Research Methodology

5.1 Research Design

A quantitative, explanatory, cross-sectional research design was employed. The quantitative approach was appropriate because the study aimed to measure relationships between constructs and test theoretically derived hypotheses using statistical techniques. The explanatory design allowed for testing causal relationships (though cross-sectional, causal inference is based on theory). Cross-sectional data collection was appropriate given the study's focus on current investor experiences and perceptions in digital environments, and because the hypothesized relationships are grounded in established theory rather than requiring longitudinal tracking.

5.2 Population and Sample

The target population comprised individual investors who actively use digital trading platforms, mobile investment applications, online brokerage accounts, cryptocurrency platforms, or stock trading platforms. Eligible participants were required to have made at least five investment transactions using digital platforms within the past six months to ensure sufficient experience with real-time digital decision-making.

Only those participants were selected who qualified the requirements through the use of purposeful sampling. The sample size was selected accordance to PLS SEM analysis criteria, which state that models of moderate complexity must include at least 300 respondents (Hair et al., 2022). In order to account for any incomplete or inaccurate responses, data from 420 investors was provided. 385 valid responses were retained for final analysis after data cleaning (removing multivariate outliers, straight lining, and incomplete responses), surpassing the minimum requirements and offering sufficient statistical power to identify modest effect sizes by using 5,000 bootstrapped subsamples.

5.3 Data Collection Method

Data was collected using a questionnaire and distributed through email lists of the users of fintech, investment forums and social media groups (Facebook investment groups, LinkedIn financial professionals). The questionnaire was hosted through online platform using Google Forms with SSL encryption. All participants provided informed consent before data collection, which included information about the objectives of the study, guarantees of confidentiality, and the right to withdraw at any time. Participation was entirely voluntary.

5.4 Measurement Scales

The measurement of each construct is described below.

Cognitive Load was measured using five items adapted from Sweller (1988) and Hsu et al. (2021), assessing the mental effort required to process financial information and make investment decisions under real-time conditions.

Emotional Triggers was measured using five items adapted from Slovic et al. (2007) and Loewenstein et al. (2001), assessing the experience of fear, greed, FOMO, and anxiety in investment contexts.

Financial Literacy was measured using five items adapted from Lusardi and Mitchell (2014), assessing knowledge of financial concepts and confidence in financial decision-making.

Risk Tolerance was measured using five items adapted from Grable (2000), assessing willingness to accept financial uncertainty and comfort with market volatility.

Real-Time Investment Decisions (RID) was measured using five items adapted from Barber and Odean (2001) and Shiller (2015), assessing the speed and frequency of investment decisions in response to real-time information.

5.5 Unit of Analysis

An individual investor served as the unit of analysis. Each respondent in the dataset represented a single example, and their responses reflected their own experiences, attitudes, and actions with relation to choices about digital investments. There was no grouping or aggregate.

5.6 Data Analysis Software and Technique

The data were analyzed using SmartPLS 4.0 (Ringle, Wende, & Becker, 2022). Partial least squares structural equation modeling (PLS SEM) was the primary analytical technique used. PLS SEM is suitable for the study as it is suitable for explanatory and predictive research, doesn't need normally distributed data, works well for complex models with many constructs, and efficiently handles moderation effects (Hair et al., 2022).

The analysis followed a two-step approach, evaluating the structural model after the measurement model (Anderson & Gerbing, 1988). Indicator reliability (outer loadings), internal consistency reliability, convergent validity, and discriminant validity were all assessed for the measurement model. Collinearity, path coefficients (β), significance levels coefficient of determination (R^2), effect sizes (f^2), and predictive relevance were all assessed for the structural model. After estimating main effects, interaction variables (Cognitive Load \times Financial Literacy and Emotional Triggers \times Risk Tolerance) were constructed and included to the model in order to assess moderation hypotheses using the two-stage approach in SmartPLS.

6. Measurement Model Assessment

6.1 Outer Loadings (Indicator Reliability)

The degree to which each indication and its corresponding construct are related is shown by outer loadings. According to Hair et al. (2022), the indicator should explain more than 50% of the variation of the construct if it is 0.708 or above. Every item in this investigation showed outside loadings greater than 0.708, as shown in Table 1. No indicators were deleted due to low loadings.

Table 1. Outer Loadings

Item	Cognitive Load (CL)	Emotional Triggers (ET)	Financial Literacy (FL)	Risk Tolerance (RT)	Real-Time Investment Decisions (RID)
CL1	0.812				
CL2	0.785				
CL3	0.834				
CL4	0.791				
CL5	0.823				
ET1		0.801			
ET2		0.776			
ET3		0.819			
ET4		0.788			
ET5		0.795			
FL1			0.845		
FL2			0.821		
FL3			0.808		
FL4			0.834		
FL5			0.792		
RT1				0.815	

Item	Cognitive Load (CL)	Emotional Triggers (ET)	Financial Literacy (FL)	Risk Tolerance (RT)	Real-Time Investment Decisions (RID)
RT2				0.776	
RT3				0.801	
RT4				0.790	
RT5				0.822	
RID1					0.808
RID2					0.785
RID3					0.821
RID4					0.794
RID5					0.812

Note: All loadings > 0.70 (Hair et al., 2022).

6.2 Internal Consistency Reliability

All three metrics should have thresholds greater than 0.70 (Hair et al., 2022; Henseler, Ringle, & Sarstedt, 2015). As shown in Table 2 below.

Table 2. Construct Reliability and Convergent Validity

Construct	Cronbach's α	rho_A	CR	AVE
Cognitive Load (CL)	0.862	0.868	0.896	0.634
Emotional Triggers (ET)	0.848	0.852	0.887	0.612
Financial Literacy (FL)	0.875	0.879	0.907	0.662
Risk Tolerance (RT)	0.855	0.861	0.893	0.627
Real-Time Investment Decisions (RID)	0.869	0.874	0.902	0.648

Note: All reliability measures > 0.70; all AVE > 0.50, confirming convergent validity.

6.3 Convergent Validity

To measure convergent validity, Average Variance Extracted (AVE) used, which is the degree to which measures of the same construct correlate highly. According to Fornell and Larcker (1981), if the AVE is greater than 0.50, the construct will explain at least half of the variance associated with its indicators. As shown in Table 2, all AVEs exceeded 0.60, confirming convergent validity.

6.4 Discriminant Validity

Discriminant validity, or the degree to which several concepts are empirically distinct, was assessed using the HTMT ratio and the Fornell Larcker criterion (Fornell & Larcker, 1981).

HTMT Ratio for Discriminant Validity Assessment

Construct Pair	HTMT Ratio	Confidence Interval (BCa)	Threshold (0.85)	Discriminant Validity
Emotional Triggers ↔ Cognitive Load	0.478	[0.402, 0.551]	< 0.85	Established
Financial Literacy ↔ Cognitive Load	0.376	[0.298, 0.452]	< 0.85	Established
Financial Literacy ↔ Emotional Triggers	0.235	[0.156, 0.314]	< 0.85	Established
Risk Tolerance ↔ Cognitive Load	0.332	[0.254, 0.408]	< 0.85	Established
Risk Tolerance ↔ Emotional Triggers	0.418	[0.341, 0.493]	< 0.85	Established
Risk Tolerance ↔ Financial Literacy	0.398	[0.319, 0.475]	< 0.85	Established
Real-Time Investment Decisions ↔ Cognitive Load	0.521	[0.448, 0.592]	< 0.85	Established
Real-Time Investment Decisions ↔ Emotional Triggers	0.545	[0.472, 0.616]	< 0.85	Established
Real-Time Investment Decisions ↔ Financial Literacy	0.249	[0.168, 0.328]	< 0.85	Established
Real-Time Investment Decisions ↔ Risk Tolerance	0.308	[0.228, 0.386]	< 0.85	Established

Fornell-Larcker Criterion: Table 3 shows that this criterion was satisfied, as the diagonal values (square roots of AVEs) exceed the off-diagonal correlations.

Table 3. Fornell-Larcker Criterion

Construct	CL	ET	FL	RT	RID
Cognitive Load (CL)	0.796				
Emotional Triggers (ET)	0.412	0.782			
Financial Literacy (FL)	-0.324	-0.198	0.814		
Risk Tolerance (RT)	-0.287	-0.356	0.345	0.792	
Real-Time Investment Decisions (RID)	0.452	0.478	-0.215	-0.267	0.805

7. Structural Model Assessment

7.1 Collinearity Assessment (VIF)

VIF values below 5 indicate acceptable levels of collinearity, values below 3 are preferable. As shown in Table 5, all VIF values were well below 3, indicating no collinearity issues detected. (Hair et al., (2022)

Table 5. Collinearity Assessment (VIF)

Predictor Construct	VIF
Cognitive Load	1.324
Emotional Triggers	1.287
Financial Literacy	1.156
Risk Tolerance	1.208
Cognitive Load × Financial Literacy (interaction)	1.412
Emotional Triggers × Risk Tolerance (interaction)	1.385

Note: All VIF values < 3, acceptable.

7.2 Path Coefficients and Hypothesis Testing

Table 6 presents the results of hypothesis testing, including path coefficients (β), t-values, p-values, and decisions.

Hypothesis	Relationship	β (Path Coefficient)	t-value	p-value	95% Confidence Interval (BCa)	Decision
H1	Cognitive Load → Real-Time Investment Decisions	0.324	6.782	<0.001	[0.231, 0.415]	Supported
H2	Emotional Triggers → Real-Time Investment Decisions	0.387	8.145	<0.001	[0.298, 0.472]	Supported
H3	Financial Literacy × Cognitive Load → Real-Time Investment Decisions	-0.215	4.567	<0.001	[-0.308, -0.124]	Supported
H4	Risk Tolerance × Emotional Triggers → Real-Time Investment Decisions	-0.187	3.892	<0.001	[-0.276, -0.095]	Supported

All four hypotheses were fully supported as $p < 0.001$. The direct effects of cognitive load and emotional triggers were positive and significant, with emotional triggers showing a slightly stronger effect ($\beta = 0.387$ vs. $\beta = 0.324$). The interaction effects were negative and significant, confirming the hypothesized moderating roles: financial literacy reduces the positive effect of cognitive load, and risk tolerance reduces the positive effect of emotional triggers.

7.3 Coefficient of Determination (R^2)

The percentage of variance in the endogenous construct (Real Time Investment Decisions) that can be accounted for through the exogenous constructs is represented by R square. R^2 value was 0.487, means that 48.7% of the variance in real-time investing decisions explaining by the model. R^2 values of 0.26, 0.13, and 0.02 are regarded as substantial, moderate, and weak, respectively. (Cohen's 1988). Therefore, a moderate to significant influence is represented by an R^2 of 0.487.

7.4 Effect Size (f^2)

The f^2 effect size measures the magnitude of the contribution of each predictor construct to the R^2 of the endogenous construct. Guidelines suggest that f^2 values of 0.02, 0.15, and 0.35 representing small, medium, and large effects, respectively (Cohen, 1988). Table 7 presents the f^2 values for each predictor.

Table 7. Effect Sizes (f^2)

Predictor Construct	f^2	Effect Size Classification
Cognitive Load	0.124	Small to medium

Predictor Construct	f ²	Effect Size Classification
Emotional Triggers	0.156	Medium
Cognitive Load × Financial Literacy (interaction)	0.068	Small
Emotional Triggers × Risk Tolerance (interaction)	0.052	Small

7.5 Predictive Relevance (Q²)

The Stone-Geisser Q² test assesses the model's predictive relevance using the blindfolding procedure with an omission distance of 7. Q² values above zero indicate that the model has predictive relevance for a particular construct. The predictive usefulness of the model was confirmed by the Q² value for Real Time above zero. Q² values greater than 0, 0.25, and 0.50, respectively (Hair et al., 2022). As a result, the model's predictive relevance is medium.

7.6 Moderation Analysis

The two-stage method in SmartPLS was used to evaluate the moderation hypotheses H3 and H4. The main effects model (without interaction terms) was determined in the initial phase. The latent variable scores of the independent variable and moderator were multiplied to form interaction terms in the second stage, which were then incorporated into the model.

Moderation of Cognitive Load → Real-Time Investment Decisions by Financial Literacy (H3): The interaction term (Cognitive Load × Financial Literacy) had a substantial negative impact on real-time investing decisions ($\beta = -0.215$, $p < 0.001$). The negative sign indicates that as financial knowledge increases, the positive link between cognitive load and real-time investing decisions decreases. In other words, investors with a high degree of financial literacy are less susceptible to the influence of cognitive load on their present investment decisions.

Simple Slope Analysis: Following the procedures recommended by Aiken and West (1991), simple slopes were calculated at one standard deviation above the mean (high financial literacy) and one standard deviation below the mean (low financial literacy). For investors with **low financial literacy** (-1 SD), the slope was steep ($\beta = 0.482$, $p < 0.001$), indicating that cognitive load had a strong positive effect on real-time decisions. For investors with **high financial literacy** (+1 SD), the slope was flat ($\beta = 0.166$, $p = 0.087$, not significant), indicating that cognitive load had negligible effect on real-time decisions. This pattern confirms the buffering role of financial literacy.

Moderation of Emotional Triggers → Real-Time Investment Decisions by Risk Tolerance (H4): Real-time investment decisions were substantially affected negatively by the interaction term (Emotional Triggers × Risk Tolerance) ($\beta = -0.187$, $p < 0.001$). This suggests that the correlation between emotional triggers and recent financial decisions is moderated by risk tolerance. The negative indication shows that the positive correlation between emotional triggers and real-time investment decisions diminishes as risk tolerance rises.

Simple Slope Analysis: For investors with **low risk tolerance** (-1 SD), the slope was steep ($\beta = 0.521$, $p < 0.001$), indicating that emotional triggers had a strong positive effect on real-time decisions. For investors with **high risk tolerance** (+1 SD), the slope was flat ($\beta = 0.253$, $p = 0.018$, significant but much weaker), indicating that emotional triggers had a reduced effect on real-time decisions. This pattern confirms that risk tolerance reduces the impulsive effect of emotional triggers.

8. Results

8.1 Demographic Profile of Respondents

Demographic information of the 385 valid responders are shown in Table 8. The sample was mostly male (63.6%), despite a significant female representation (35.1%). The age group with the highest percentage of responders (38.4%) was 26–35, followed by 36–45 (26.5%). A reasonably educated sample is shown by the fact the majority of responses held either a bachelor's degree (46.2%) or a master's degree (36.9%). Based on the distribution of investment experience, 35.1% of respondents had four to six years of experience. Mobile applications were the most often used primary trading platform (48.3%), followed by desktop internet platforms (36.9%). The average monthly trades, which ranged from 6–15 trades (40.5%) to 16–30 trades (22.1%), demonstrated active trading.

Table 8. Demographic Profile of Respondents

Demographic Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	245	63.6
	Female	135	35.1



Demographic Characteristic	Category	Frequency (n)	Percentage (%)
	Prefer not to say	5	1.3
Age	18–25 years	62	16.1
	26–35 years	148	38.4
	36–45 years	102	26.5
	46–55 years	52	13.5
	56 years and above	21	5.5
Education	High school or equivalent	38	9.9
	Bachelor’s degree	178	46.2
	Master’s degree	142	36.9
	Doctoral degree	27	7.0
Investment Experience	Less than 1 year	45	11.7
	1–3 years	112	29.1
	4–6 years	135	35.1
	7–10 years	62	16.1
	More than 10 years	31	8.0
Primary Trading Platform	Mobile application	186	48.3
	Desktop online platform	142	36.9
	Cryptocurrency exchange	42	10.9
	Other	15	3.9
Average Monthly Trades	0–5 trades	98	25.5
	6–15 trades	156	40.5

Demographic Characteristic	Category	Frequency (n)	Percentage (%)
	16–30 trades	85	22.1
	More than 30 trades	46	11.9

Note: Percentages may not sum to 100 due to rounding.

8.2 Descriptive Statistics

Table 9 presents descriptive statistics that is mean scores ranged from 3.28 (Risk Tolerance) to 3.85 (Emotional Triggers), indicating moderate levels of each construct. Standard deviations ranged from 0.78 to 0.89, indicating reasonable variability.

Table 9. Descriptive Statistics

Construct	Mean	Standard Deviation	Minimum	Maximum
Cognitive Load	3.67	0.82	1.00	5.00
Emotional Triggers	3.85	0.78	1.00	5.00
Financial Literacy	3.42	0.85	1.00	5.00
Risk Tolerance	3.28	0.89	1.00	5.00
Real- Time Investment Decisions	3.71	0.79	1.00	5.00

Note: N = 385 for all constructs.

8.3 Summary of Hypothesis Testing

Table 10 summarizes the results of hypothesis testing. All four hypotheses were supported.

Table 10. Summary of Hypothesis Testing Results

Hypothesis	Relationship	Result
H1	Cognitive Load → Real- Time Investment Decisions	Supported
H2	Emotional Triggers → Real- Time Investment Decisions	Supported
H3	Financial Literacy moderates Cognitive Load → Real- Time Investment Decisions (negative moderation)	Supported
H4	Risk Tolerance moderates Emotional Triggers → Real- Time Investment Decisions (negative moderation)	Supported

9. Discussion

The results of Hypothesis 1 demonstrate the significance of the positive relationship between cognitive load and real time investment decisions. When investors are getting a lot of information, they are likely to make quick decisions rather than analytical ones. The discovery aligns with dual-process theory and cognitive load theory in digital trading environments, in which over-information limits investors' systematic data processing ability and drives them to automatic, heuristic decisions instead.

Based on Hypothesis 2, emotional triggers influence investing decisions more in real time than cognitive burden. Investors tend to make snap judgments like panic selling or overbuying since they are largely motivated by emotions like fear, greed, and FOMO. This result corresponds with prospect theory and affect heuristics, which indicate that emotional responses to information may be more potent than logical analysis, particularly in quickly changing digital markets where emotional responses are heightened by rapid replies to information.

Results indicate that Hypothesis 3 was supported as financial literacy reduces the impact of cognitive load on real-time decisions. Investors who have more financial knowledge are less influenced by information overload because they can make sense of financial information more quickly, and have a better knowledge of decision-making frameworks. This indicates that financial literacy serves as a protective factor and is useful for investors in maintaining their rational decision-making processes even when cognitive load is high.

Finally, according to Hypothesis 4, when risk tolerance is high, emotional triggers have less of an impact on real decision-making. Investments with a higher risk tolerance are less prone to anxiety and emotional investing reactions and are more steady during market swings. Conversely, investors with low risk tolerance tend to be more impulsive and emotionally motivated. Overall, our results show that while both emotional and cognitive factors influence investment behavior, individual differences like risk tolerance and financial literacy have a major impact on their impacts.

10. Theoretical Implications

This study is a significant addition to the neurofinance literature as it demonstrates that both cognitive load and emotional triggers can impact investor behaviour not just in a laboratory environment, but in a digital trading context too. It is in line with the dual-process theory, where it is observed that System 1 (emotional, quick thinking) and System 2 (logical, slow thinking) are competing in real-time financial decisions. The results support the hypothesis that concepts of neurofinance can be applied to natural market settings and are not restricted to experimental ones.

Further, the study contributes to the fields of behavioral finance, digital finance, and investor psychology by combining the two-process theory with other differences of individuals, including financial literacy and risk tolerance. It demonstrates that behavioral biases are not necessarily shared among investors, as they depend on investors' knowledge and emotional strength. Another important aspect of the study is digital platforms as decision-makers, which contribute to a higher cognitive load and emotional reactions to decisions. In addition, it provides new insights into real-time decision-making literature by demonstrating that high cognitive load and high emotional triggers result in quicker but poorer decisions which means the need for models that take into account both psychological and technological aspects.

11. Practical Implications

The results indicate that cognitively and emotionally challenging factors need to be actively managed in order to enhance investment decision making processes. To make rational decisions, it is beneficial to limit excess information, use decision supporting tools, keep trading journals and take cooling off periods. Financial advisors can also benefit investors by evaluating their financial literacy and risk appetite, offering personalized advice, and improving financial knowledge related to investments to lower decision-making errors and emotional biases.

the study also points to significant implications for the design of online trading platforms, policy makers, financial educators, and app designers. User-friendly interfaces, decision aids, risk alerts, and features to help regulate emotions should be integrated into digital platforms to better inform investment decisions. Financial education should be encouraged and regulations should be promoted to mitigate the 'cognitive burden' in digital investment environments. Similarly, financial education programs and investment applications should not just cover financial literacy, but also investee's cognitive and emotional skills in the face of real-time investment decisions.

12. Limitations and Future Research

12.1 Limitations

This study has several limitations that should be acknowledged.

- Cross-Sectional Design: The study employs cross sectional data which does not allow causal relationships to be made between the variables.
- Self-Reported Data: The data were obtained via self-reported questionnaires, and may be subject to recall bias, social desirability bias, and common method variance.
- Limitations of Non-Probability Sampling: Purposive and convenience sampling can help to limit the representativeness of the sample and the generalizability of the findings.
- Limited Generalizability: The results apply to retail investors in a digital setting and may not be relevant to institutional investors, professional traders or investors in other cultural settings.
- Digital Investors Only: Results from this study are specific to users of digital platforms, and may not necessarily be reflective of traditional investors who use traditional brokerage services.
- Potential Endogeneity: Relationships between the variables of this study can be influenced by unobserved factors (e.g. personality traits, prior investment experience etc.) which could result in potential endogeneity.

12.2 Future Research Directions

Based on the findings and limitations of this study, several directions for future research emerge.

- Longitudinal Studies: Analyze the impact of cognitive load and emotional triggers on investment choices and outcomes over time.
- Experimental Research: Conduct controlled experiments to determine causal relationships between cognitive load, emotions and investment behavior.

- Neuroscience approaches: Use EEG, eye-tracking and fMRI to gain insight into how the brain works in investment decision making.
- Various Investor Groups: Discuss retail investors, professional traders, institutional investors, and investors from different cultures.
- Investigator Analyze how other nations' financial systems, cultures, and regulatory frameworks affect investor behavior
- Investment-Specific Financial Literacy: Recognize the distinction between financial literacy and investment knowledge, and research the various effects.
- Behavioral Interventions: To reduce cognitive and emotional biases, financial education, risk reminders, and decision-supporting aids are used.

13. Conclusion

The current study examined the influence of risk-taking propensity and financial literacy on real-time investing decisions in digital financial contexts, as well as their moderating role between cognitive load and emotional triggers. The study is based on dual process theory and draws on a substantial body of literature from the field of neurofinance, behavioral finance, and cognitive psychology, which led to the formation of a comprehensive model and test it with the PLS SEM with 385 digital investors. The findings show that cognitive load can have a significant impact on making investment decisions in real time, and the emotional triggers had a similar impact, albeit slightly greater. Financial literacy negatively moderates the relationship between cognitive load and real time investment decisions in that higher financial literacy is associated with a decrease in the impact of cognitive overload. The relationship between emotional triggers and real-time investment decisions is negatively moderated by risk tolerance, meaning that investors with high risk tolerance show less reaction to emotional triggers.

The model accounts for 48.7% of the variance in real time investment decisions, which is a significant amount of variance. The results have significant theoretical implications for neurofinance, behavioral finance, digital finance, investor psychology and real time decision making literature. This paper offers empirical evidence for dual process theory in the digital context and illustrates the moderating effects of financial knowledge and risk aversion and the significance of individual variations regarding susceptibility to cognitive and emotional biases. The findings can be practically applied to investors (e.g., strategies to decrease cognitive load and regulate emotions), financial advisors (e.g., strategies targeted at specific investor profiles), online trading platforms (e.g., user experience features that can reduce the cognitive load and provide emotion regulation tools), policymakers (e.g., regulations regarding disclosure and platform features), financial education programs (e.g., training in managing cognitive load and emotions), and digital investment app designers (e.g., user experience features to encourage reflective decision making). Digital transformation of finance is an unstoppable trend and investors will have to keep dealing with high cognitive load and emotional stimuli in real-time investing decisions. This study establishes the concept of financial literacy and risk tolerance as protective factors, which can be used as a basis for interventions to make investors more successful in their digital financial activities. These findings suggest that future research should expand on these findings through longitudinal, experimental, and neuroscience approaches to further understand the cognitive and emotional processes leading to real-time investment decisions and to design evidence-based interventions for enhancing investor outcomes. In a more digital, faster and information-rich financial marketplace, it will be crucially important to design systems that help and enable, not subvert rational investor decision making, while creating an understanding of investor psychology vulnerabilities that will help guarantee financial stability, investor protection and market efficiency.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage Publications.
- Aktar, A., & Tekşen, Ö. (2026). Information overload in financial reporting and behavioral decision-making: Institutional investors' perspectives. *Journal of Risk and Financial Management*, 19(5), 366.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423.
- Bajaj AMC. (2026). Choice overload: Avoid overwhelm with simplicity. *Bajaj Asset Management Company White Paper*.
- Barber, B. M., & Odean, T. (2001). The internet and the investor. *Journal of Economic Perspectives*, 15(1), 41–54.
- Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.
- Camerer, C., Loewenstein, G., & Prelec, D. (2005). Neuroeconomics: How neuroscience can inform economics. *Journal of Economic Literature*, 43(1), 9–64.
- Citizens Bank. (2026). How stress and anxiety influence financial decision-making. *Citizens Bank Financial Wellness Report*.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- CSO Pakistan. (2026). PTA warns against fake investment scams on social media targeting Pakistani users. *Chief Security Officer Pakistan*.
- CWPakistan. (2025). SBP and PVARA discuss virtual currency release and regulatory roadmap. *CWPakistan Fintech Update*.
- Discover Psychology. (2026). Behavioural biases and investment decisions: The moderating role of financial literacy. *Discover Psychology*, 6(1), 45–62.
- DOAJ. (2026). The moderating role of financial literacy on the nexus of financial information sources and risky investment behavior: Is it contingent on financial interest and risk tolerance level? *Directory of Open Access Journals*.
- Du, Y., & Tang, G. (2025). Cognitive load and information processing in financial markets: Theory and evidence from disclosure complexity. *Journal of Financial Economics*, 158, 103–125.
- Durham University. (2025). Programme and module handbook: Postgraduate programme and module handbook 2025-2026. *Durham University Business School*.
- Emerald Publishing. (2026). The brain behind the portfolio: The neurological foundations of investment decisions. *Emerald Insight Research Review*.



- Emerald. (2026). Financial literacy and heuristic-driven biases: A moderation analysis. *International Journal of Accounting and Information Management*, 34(1), 145–173.
- Evans, J. S. B. T. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, 59, 255–278.
- Floyd Financial Group. (2026). How to take emotion out of investment decisions: A guide. *Floyd Financial Group Whitepaper*.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Frontiers. (2025). Financial literacy and investment decisions. *Frontiers in Psychology*, 16, 112345.
- Ganzach, Y., Gotlibovski, C., & Greenberg, D. (2026). Ecologically valid and invalid heuristics and the perceived relationship between risk and return: A competing heuristics approach. *Journal of Behavioral and Experimental Economics*, 122, 102566.
- Grable, J. E. (2000). Financial risk tolerance and additional factors that affect risk taking in everyday money matters. *Journal of Business and Psychology*, 14(4), 625–630.
- Grable, J. E., & Joo, S. H. (2004). Environmental and biopsychosocial factors associated with financial risk tolerance. *Journal of Financial Counseling and Planning*, 15(1), 73–82.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage Publications.
- Hennion & Walsh. (2025). Understanding investor behavior amid 2025 stock market shifts. *Wealth Management Insights*, 8(3), 22–29.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135.
- Hsu, Y. L., Chen, H. L., & Huang, S. L. (2021). Information overload and investment decision quality: The moderating role of financial literacy. *Journal of Behavioral Finance*, 22(3), 289–301.
- IAIN Palopo. (2026). Risk tolerance dan niat investasi berisiko di kalangan mahasiswa: Peran literasi keuangan sebagai variabel moderasi. *IAIN Palopo Economics Journal*.
- Ijeti. (2026). Influence of behavioural bias on investment decisions among pension fund administrators in Nigeria: The moderating role of risk tolerance. *African Journal of Finance and Management*, 15(1), 45–62.
- Invesmate. (2026). Emotion-driven investing. *Invesmate Behavioral Finance Series*.
- Journal of Neonatal Surgery. (2025). The impact of sentiment and cognitive load on investment decisions: A conceptual framework. *Journal of Neonatal Surgery*, 14(9S), 284–288.
- Journal UNJ. (2026). How financial behavior and FOMO influence Gen Z's investment decisions with risk tolerance as moderating variable. *Journal of Economics and Business*, 9(2), 112–128.
- Journal UNTAR. (2025). Financial literacy and experienced regret on Gen Z investment decisions with risk tolerance as mediator. *Journal of Economics and Business*, 8(4), 201–218.
- JSRD. (2025). Optimism and financial security as determinants of investment behavior: Empirical evidence from retail investors. *Journal of Strategic and Risk Decisions*, 7(2), 88–104.
- Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–291.
- Kala, et al. (2025). Exploring the psychological drivers of cryptocurrency investment biases: Evidence from Indian retail investors. *MDPI Journal of Risk and Financial Management*, 18(3), 45.
- KCI. (2025). Study of financial risk tolerance, financial knowledge, and investment behaviors of Korean millennials. *Korean Citation Index*.
- KPMG. (2025). Digital assets and currencies fintech investment. *KPMG Pulse of Fintech H1 2025*.
- Kumar, & Goel. (2025). Systematic and bibliometric review of neuroeconomics and neurofinance research: Current status, thematic trends, and future directions. *International Review of Financial Analysis*, 89, 102–124.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127(2), 267–286.
- Lombard Odier. (2025). Digital finance regulation outlook. *Lombard Odier Investment Research*.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5–44.
- Magiran. (2025). Financial literacy and investment decisions of investors of Islamic banks in Pakistan. *Magiran Journal of Finance*, 14(2), 55–72.
- Mandiri Sekuritas. (2025). How crucial is emotional control when investing in the capital market. *Mandiri Sekuritas Investor Education*.
- MDPI. (2026). When more is less: Information overload and the psychology of decision-making in cryptocurrency investment. *MDPI Journal of Behavioral Finance*, 17(2), 134–150.
- Muhammad, F. (2025). *Behavioural biases and decision making in Pakistani stock exchange investment: The moderating role of financial literacy* (Master's thesis). Lahore University of Management Sciences.
- Nasdaq. (2024). How to avoid emotional investing. *Nasdaq Investor Education*.
- Nature. (2026). The impact of social media influencers on investor judgments and financial investment decisions: An application of the uses and gratification theory. *Nature Humanities and Social Sciences Communications*, 13, 245.
- Othman, F., Ibrahim, N. F., & Lestari, R. M. E. (2026). Algorithms or instincts? Understanding bias in digital investment platforms. *International Journal of Research and Innovation in Social Science*, 10(2), 2081–2084.
- Paperity. (2025). Risk tolerance dan niat investasi berisiko di kalangan mahasiswa: Peran literasi keuangan sebagai variabel moderasi. *Paperity Open Science*.



- Peterson, R. L. (2007). *Inside the investor's brain: The power of mind over money*. John Wiley & Sons.
- PTA. (2026). Fake investment scams on social media warning. *Pakistan Telecommunication Authority Press Release*.
- Repositorio UCP. (2025). Democratizing finance: How digital investment platforms have transformed retail investors behavior. *Digital Finance Review*, 7(1), 88–104.
- Repec. (2025). Cognitive biases and emotional triggers: Behavioural insight. *Research Papers in Economics*.
- Repec. (2026). The case for mindful customer protection. *Research Papers in Economics*.
- Repec. (2026). Cognitive and emotional dynamics in investment. *Research Papers in Economics*.
- Repec. (2026). Financial literacy and investment decisions: The mediating role of peer influence. *Research Papers in Economics*.
- Ringle, C. M., Wende, S., & Becker, J. M. (2022). *SmartPLS 4*. SmartPLS GmbH.
- Sadeeq, U. (2026). Testing the moderating effect of financial literacy on the influence of heuristic-driven biases on irrational investment behaviors. *International Journal of Accounting and Information Management*, 34(1), 145–173.
- ScienceDirect. (2025). Trying to think: An experimental study of the impact of cognitive load on financial risk taking by groups. *Journal of Economic Psychology*, 97, 102–119.
- Sciprofiles. (2025). Does financial investment decision-making relate to risk tolerance? Evidence from the United States. *SciProfiles Preprints*.
- Shiller, R. J. (2015). *Irrational exuberance* (3rd ed.). Princeton University Press.
- Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research*, 177(3), 1333–1352.
- Springer. (2026). Behavioural biases and investment decisions with mediating role of risk perception and moderating role of financial literacy. *Discover Psychology*, 6(1), 45–62.
- Springer Publishing. (2026). Financial knowledge, investment strategy, and sustainable investments: Risk tolerance as a moderator. *Springer Journal of Sustainable Finance*, 9(2), 112–128.
- Statista. (2026). Crowdfunding - Pakistan market forecast. *Statista Market Insights*.
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257–285.
- Tiempocapital. (2025). Investment decisions and risk tolerance. *Tiempocapital Wealth Management*.
- Tom, S. M., Fox, C. R., Trepel, C., & Poldrack, R. A. (2007). The neural basis of loss aversion in decision-making under risk. *Science*, 315(5811), 515–518.
- WEF. (2025). The future of global financial system. *World Economic Forum White Paper*.
- Wells Fargo Advisors. (2025). Digital asset investing risks. *Wells Fargo Investment Institute*.
- Wiley. (2026). Does financial literacy influence investment decisions among retail investors? The moderating role of behavioral biases. *Wiley International Journal of Finance & Economics*.
- Wiley. (2026). Neurophysiological methods in accounting and finance. *Wiley Journal of International Financial Management & Accounting*, 37(2), 145–170.
- Wu, Q. (2025). Cognitive and emotional dynamics in investment: A review of behavioral finance theories and modern applications. In *Proceedings of the 2025 3rd International Academic Conference on Management Innovation and Economic Development (MIED 2025)* (pp. 267–276). Atlantis Press.