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Cognitive Biases and Investment Choices: Exploring the Psychological Determinants of Financial Decision-Making in Thailand

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Abstract
This study delves into the psychological biases that significantly influence investment preferences and decisions. The primary objective is to dissect and understand the particular psychological factors that sway individual investment choices. Further, it examines the roles of risk perception and financial literacy in shaping these investment decisions. By identifying and understanding these psychological influences, the research aims to equip financial advisors with the necessary insights to enhance client service by addressing these biases effectively. Additionally, it seeks to empower individual investors with the knowledge to recognize and counteract these biases, thereby fostering more informed and rational investment decisions. To achieve these goals, data were gathered through a convenience sampling method using a detailed survey designed to capture the nuances of investor behavior and the underlying psychological factors. The study employed robust statistical tools, including regression analysis and correlation techniques, to analyze the theoretical constructs and their interrelationships. The study also substantiated the significant roles that financial literacy and risk perception play in shaping these decisions. These factors are crucial in determining how investors process information and make financial choices, emphasizing the importance of education and informed risk assessment in investment strategies. One noted limitation of this research is its concentration on only three specific biases, while numerous other psychological biases exist that could also profoundly affect investment decisions. Future research could expand on this foundation by exploring additional biases and their impacts, potentially offering a more comprehensive view of the psychological landscape that investors navigate.

Keywords: *Investment Behavior, Psychological Biases, Financial Literacy, Risk Perception*
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1. INTRODUCTION

Behavioral aspects in finance and investing have not been given sufficient recognition as critical factors influencing investor decision-making. Traditional financial theories assume that investors behave rationally, making optimal choices based on available information. However, the persistent occurrence of market anomalies and financial crises has challenged this assumption, leading to the emergence of behavioral finance as an important field of study (Kahneman & Tversky, 1979; Shahabuddin & Ali, 2024). Behavioral finance seeks to explain actual financial behavior by highlighting the cognitive errors and psychological biases that investors exhibit when making financial decisions, rather than prescribing the ideal decision-making framework that traditional finance assumes (Shiller, 2003; Thanh & Sahadewo, 2024). The financial services sector and stock market play a fundamental role in accelerating economic growth. Their impact on national economic development is substantial and inseparable from broader financial stability. However, understanding stock market operations remains

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complex due to the diverse nature of market participants (Thaler, 2005; Idris, 2023). The stock market consists of multiple participants operating within both the primary and secondary market segments, each engaging with different motivations and requirements. Investors in capital markets vary in their objectives, risk tolerance, and investment strategies, which significantly influence market dynamics (Barberis & Huang, 2001; Diaz & Weber, 2020).

Investment decisions are often shaped by various psychological biases, including overconfidence, loss aversion, herd behavior, and anchoring, all of which can significantly impact financial markets. These cognitive distortions influence investor behavior, leading to deviations from rational decision-making and contributing to inefficiencies in market performance. Overconfidence causes investors to overestimate their knowledge and predictive abilities, often resulting in excessive risk-taking. Loss aversion, the tendency to fear losses more than equivalent gains, can lead to risk-averse behavior and premature sell-offs. Herd behavior, where investors follow market trends without independent analysis, exacerbates speculative bubbles and rapid sell-offs. Anchoring occurs when investors rely too heavily on specific reference points, such as past prices, influencing their investment decisions regardless of new information. These psychological tendencies collectively contribute to market anomalies, including asset mispricing, speculative booms, and heightened volatility (Shefrin, 2000; Luna & Luna, 2018). Understanding these biases is crucial for developing more effective risk management strategies and improving market stability. Future research should explore behavioral interventions, financial education programs, and policy measures that can mitigate the adverse effects of psychological biases on investment decisions and market dynamics. As a result, prices fluctuate based on the actions and perceptions of different investors. The evolving understanding of risk tolerance among modern investors has led to increased participation in stock markets (Willy, 2018; Statman, 2019; Adejumobi, 2019; Westermann & Schunk, 2022; Sadashiv, 2023). This growing involvement extends across various investor categories, including retail investors, institutional investors, and general market participants, each contributing uniquely to capital market activities. As financial markets become increasingly accessible to a broader range of investors, behavioral finance has emerged as a critical factor in shaping investment behavior. The interaction between emotions, cognitive biases, and financial decision-making influences not only individual investment choices but also broader market trends and stability. Psychological factors such as fear, greed, and overconfidence drive market movements, often leading to excessive speculation, asset bubbles, and heightened volatility. Cognitive biases, including confirmation bias, recency bias, and loss aversion, further impact investment strategies by causing investors to misinterpret information or react irrationally to market fluctuations. These behavioral tendencies create inefficiencies in asset pricing and contribute to market anomalies that traditional financial theories struggle to explain (Lo, 2004). Understanding the psychological dynamics behind financial decision-making is essential for investors, policymakers, and financial institutions seeking to improve market efficiency and stability. Incorporating behavioral insights into financial education programs, investment strategies, and regulatory policies can help mitigate irrational market behaviors and promote more rational, data-driven decision-making. Future research should explore how digital financial platforms, algorithmic trading, and behavioral interventions influence investor psychology in modern financial markets. Recognizing and addressing these behavioral influences can lead to more effective investment strategies and improved market stability. As financial markets continue to evolve, understanding investor psychology will be essential for developing more resilient and adaptive financial models that reflect real-world decision-making patterns.

In the ever-evolving capital market landscape, institutional investors play a pivotal role in influencing market size, structure, and overall efficiency. Their significant financial resources and strategic investment decisions contribute to market liquidity, price stability, and capital allocation. Institutional investors—such as pension funds, mutual funds, insurance companies, and hedge funds—drive market trends by engaging in large-scale transactions that impact asset pricing and investment flows. Their participation enhances market depth, reduces volatility, and promotes financial stability by fostering long-term investment strategies. Additionally, institutional investors often influence corporate governance practices, as their investment choices and shareholder activism shape company policies, management decisions, and business transparency. Their role in stabilizing markets is particularly evident during periods of economic uncertainty, as they provide liquidity and counteract excessive speculation (Audi et al., 2021; Nasir, 2022; Abdur-Rauf & Raimi, 2024). However, institutional investment can also lead to market concentration and potential systemic risks if their investment strategies align too closely, amplifying market fluctuations. Understanding their impact is essential for regulators, financial analysts, and policymakers aiming to maintain balanced and efficient capital markets. Future research should explore how technological advancements, algorithmic trading, and regulatory frameworks influence institutional investment behavior and market stability. Their participation significantly impacts market liquidity, stability, and efficiency. Given the growing complexity of financial markets, understanding the various factors that influence individual investors' decision-making has become increasingly important. Behavioral finance has emerged as a key area of research, highlighting how psychological biases and cognitive errors affect investment choices. However, despite the expanding body of literature, risk perception has not been thoroughly examined as a mediating variable in investment decision-making. Additionally, the moderating effect of financial literacy remains underexplored, particularly in the context of developing economies where financial knowledge levels vary widely (Kahneman & Tversky, 1979; Thaler, 2005). Behavioral factors significantly impact investors' decision-making processes, ultimately influencing their investment success and financial returns. Psychological biases, including overconfidence, loss aversion, anchoring, and herd behavior, often result in suboptimal investment decisions by causing investors to deviate from rational financial strategies. Overconfidence can lead to excessive risk-taking, while loss aversion may prompt investors to avoid necessary risks or sell assets prematurely to minimize perceived losses. Anchoring, or relying too heavily on initial information, can distort

judgment, whereas herd behavior leads individuals to follow market trends without independent analysis. However, investors who actively recognize and manage these cognitive distortions can make more informed and rational financial choices, ultimately enhancing their investment performance. This study is particularly valuable for retail investors, emphasizing the importance of behavioral awareness in financial decision-making. By applying disciplined investment strategies, diversifying portfolios, and using objective data rather than emotional impulses, individual investors can improve their financial outcomes (Shefrin, 2000; Cizakca, 2024). Additionally, financial literacy programs and behavioral finance tools can further aid investors in mitigating biases, leading to better risk assessment and long-term wealth accumulation. Future research should explore how technology-driven investment platforms, such as robo-advisors and AI-driven analytics, can help investors reduce behavioral biases and optimize decision-making. Moreover, given the limited research on behavioral finance in developing countries, this study serves as a valuable contribution to the literature, particularly in the context of Thailand. The study also seeks to explore whether only highly experienced investors possess the ability to make sound financial decisions or if financial literacy can enable less experienced investors to make rational investment choices. By investigating the role of financial education, the research aims to determine whether enhanced financial literacy can act as a protective factor against common behavioral biases in investment decision-making. Gaining a deeper understanding of these behavioral dynamics offers valuable insights into how investors with varying levels of experience navigate financial markets and make strategic investment decisions. Experienced investors may develop greater awareness of cognitive biases and apply risk management techniques to optimize their portfolios, whereas novice investors may be more susceptible to emotional decision-making and irrational market reactions. Factors such as financial literacy, past investment experiences, and access to analytical tools influence how individuals process information and respond to market fluctuations. Recognizing these behavioral tendencies enables investors to adopt more disciplined investment strategies, minimize impulsive decisions, and enhance long-term financial performance (Shahbaz, 2018; Statman, 2019; Ali & Mohsin, 2023). Furthermore, understanding investor psychology is beneficial for financial advisors, asset managers, and policymakers seeking to design effective financial education programs and investment frameworks that mitigate irrational behaviors. Integrating behavioral finance principles into investment training, digital advisory platforms, and risk assessment models can further support investors in making data-driven and informed financial choices. Future research should explore the role of technology, algorithmic trading, and behavioral nudges in helping investors overcome psychological biases and improve decision-making in complex financial environments. The findings of this research have broader implications beyond individual investors. Business, finance, and commerce students can benefit from the study by gaining a deeper understanding of behavioral finance, which could serve as a foundation for future research in this domain. Moreover, traders and market regulators can leverage these insights to better understand how behavioral factors contribute to stock market fluctuations and overall market dynamics. Psychological biases such as overconfidence, herd behavior, and loss aversion often drive market volatility, leading to asset mispricing and speculative bubbles. By recognizing these behavioral influences, traders can refine their investment strategies, incorporate risk management techniques, and make more data-driven decisions. Similarly, market regulators can design policies aimed at enhancing market stability by addressing irrational trading behaviors and preventing excessive speculation. Regulatory frameworks incorporating behavioral finance principles can help mitigate systemic risks by promoting transparency, investor education, and responsible trading practices. Understanding how emotions and cognitive biases impact financial markets enables the development of intervention strategies, such as circuit breakers, transaction taxes, and algorithmic safeguards, to reduce market disruptions caused by panic selling or speculative trading. Additionally, financial analysts can use behavioral insights to interpret market trends more accurately and anticipate shifts in investor sentiment. Future research should explore how technological advancements, such as artificial intelligence and algorithmic trading, interact with behavioral biases to influence market efficiency and price stability. Recognizing that investor behavior plays a crucial role in market movements can aid regulators in formulating policies that promote market stability and efficiency. By acknowledging the psychological aspects of investing, policymakers can implement financial education programs and investor protection measures that foster more informed decision-making in capital markets (Lo, 2004).

2. LITERATURE REVIEW

The decision-making process in financial markets is inherently complex, shaped by a combination of internal psychological factors and external economic influences. In the Indian securities market, behavioral traits significantly impact investor preferences, particularly in the selection of multi-bagger stocks—stocks that generate multifold returns over time (Chauhan, Gupta, & Gupta, 2022). Investors' risk appetite, cognitive biases, and past experiences influence their ability to identify high-growth stocks with strong long-term potential. Additionally, investment patterns in India have increasingly incorporated environmental, social, and governance (ESG) considerations, reflecting a broader shift toward socially responsible investing (Sood et al., 2023). This growing focus on sustainability-driven investments highlights the importance of ethical business practices, corporate accountability, and environmental stewardship in shaping investor decisions. As financial markets evolve, understanding the role of behavioral finance and ESG preferences becomes essential for asset managers, regulators, and institutional investors seeking to align investment portfolios with ethical and sustainability criteria. Furthermore, technological advancements, such as AI-driven financial analytics and ESG scoring models, are expected to enhance investment decision-making by providing data-driven insights into long-term stock performance. Future research should explore how behavioral finance and ESG considerations interact to influence investment trends across emerging and

developed markets. In the Palestinian food industry, the adoption of halal standards significantly influences financial performance and stock market outcomes (Amer, 2023). A review of recent literature highlights key behavioral biases, including overconfidence, confirmation bias, familiarity bias, and recency bias, all of which impact financial decision-making. Among these, recency bias has been found to exert a significant influence on financial decisions in India (Jain & Kesari, 2022). Investors often rely on recent events while disregarding historical data, leading to suboptimal investment choices. Experience and market complexity do not mitigate this bias, as recency bias has been consistently shown to affect investment behavior (Sulistiawan & Wijaya, 2015). Similarly, South African investors display familiarity bias when selecting companies for investment, which negatively affects portfolio diversification (Vries, Erasmus, & Gerber, 2017). Investors who exhibit familiarity bias tend to overinvest in domestic or well-known companies, reducing the benefits of diversification (Nurcahya & Dewi, 2021; Rosyidah & Pratikto, 2022).

Confirmation bias is a significant psychological factor that adversely impacts financial decision-making by leading investors to prioritize information that aligns with their pre-existing beliefs while disregarding objective financial data (Weixiang, Qamruzzaman, Rui, & Kler, 2022). This cognitive bias reinforces subjective viewpoints, reducing the likelihood of adapting to new market information or adjusting investment strategies in response to emerging trends. Investors affected by confirmation bias may selectively interpret financial news, overvalue opinions that validate their expectations, and ignore warning signs of potential market downturns. Such behavior can result in suboptimal investment choices, including holding onto underperforming stocks for too long or failing to diversify portfolios effectively. Additionally, confirmation bias may contribute to speculative bubbles, as investors collectively reinforce bullish or bearish sentiments without critically assessing fundamental market indicators. Recognizing and mitigating this bias is essential for improving financial decision-making and fostering a more rational investment approach. Strategies such as employing data-driven analysis, seeking diverse opinions, and utilizing algorithmic trading models can help investors minimize the influence of confirmation bias. Future research should explore how financial literacy programs and behavioral interventions can enhance decision-making by promoting critical evaluation and reducing cognitive distortions in investment practices. This bias is prevalent among professional investors, influencing their investment choices and limiting their ability to adjust to new information (Berthet, 2022). While the impact of confirmation bias is statistically significant, its effect on financial decisions remains relatively small (Sharma & Kumar, 2022). Overconfidence bias is one of the most extensively studied behavioral biases in financial decision-making. In Pakistan Stock Exchange (PSX) investors, overconfidence bias significantly influences investment choices, with financial literacy acting as a moderating factor and risk perception serving as a mediating variable (Ahmad & Shah, 2020). Overconfidence is a significant behavioral bias that influences financial decision-making, particularly in the U.S. capital markets, where it contributes to excessive trading activity and heightened market volatility (Bates, 2020). Investors exhibiting overconfidence tend to overestimate their knowledge, predictive abilities, and control over market outcomes, leading to frequent trading, higher transaction costs, and suboptimal investment performance. This bias often results in speculative trading behavior, mispricing of assets, and increased market fluctuations. Similarly, in Abu Dhabi, overconfidence has been identified as a key determinant of investment decisions, with studies highlighting its direct positive impact on investor behavior (Shah, Alshurideh, Dmour, & Al-Dmour, 2021). Investors displaying overconfidence in this market are more likely to engage in aggressive investment strategies, take on excessive risk, and underestimate potential financial losses. While confidence is essential for market participation, unchecked overconfidence can lead to speculative bubbles and irrational market movements. Addressing this bias requires investors to adopt data-driven decision-making strategies, diversify portfolios, and consider external expert opinions. Future research should explore the impact of financial education, digital trading platforms, and artificial intelligence-driven advisory tools in mitigating the effects of overconfidence on investment behavior and market stability. The detrimental consequences of overconfidence were evident in the Indian capital markets, where panic selling triggered by this bias led to one of the most significant market crashes in history (Kwatra, 2020; Bhoj, 2019).

The degree to which overconfidence bias influences investment behavior differs across financial markets, with various demographic and experiential factors shaping its impact. In Egypt, investor decision-making is moderated by elements such as financial experience, education level, gender, and age, which collectively determine the extent of overconfidence in financial choices (Metawa et al., 2019). More experienced and highly educated investors may exhibit lower susceptibility to overconfidence bias due to their exposure to diverse market conditions and analytical skills. Conversely, less experienced investors may overestimate their market knowledge, leading to excessive risk-taking and frequent trading. Additionally, studies suggest that gender plays a role in moderating overconfidence, with male investors generally exhibiting higher levels of risk-taking behavior than their female counterparts. Age also influences investment tendencies, as younger investors may be more prone to overconfidence due to limited market exposure, while older investors tend to adopt more cautious strategies. These findings highlight the importance of investor awareness programs and financial literacy initiatives to reduce the negative consequences of overconfidence bias. Future research should explore the role of digital trading platforms, robo-advisors, and behavioral finance interventions in mitigating overconfidence-related investment errors across diverse financial markets. In Tehran's financial markets, perception bias reduces the impact of overconfidence, but it still significantly affects investment behavior (Sadi, Asl, Rostami, Gholipour, & Gholipour, 2011) In Pakistan, overconfidence has been found to

negatively influence financial decision-making, particularly in the Islamabad Stock Exchange, where it is further intensified by excessive optimism (Kafayat, 2014). Investors exhibiting overconfidence tend to overestimate their ability to predict market movements, leading to excessive risk-taking, frequent trading, and misallocation of capital. This behavioral bias is often compounded by an overly optimistic outlook, causing investors to ignore warning signs, underestimate potential losses, and hold onto declining stocks for extended periods. The combination of overconfidence and optimism creates market inefficiencies, increasing volatility and speculative activity. Additionally, investors influenced by this bias may engage in momentum trading, chasing past trends without critically evaluating underlying fundamentals. Such tendencies can contribute to asset bubbles and abrupt market corrections when expectations do not align with reality. Addressing these issues requires enhancing investor awareness through financial education programs, promoting risk assessment strategies, and integrating behavioral finance principles into trading regulations. Future research should investigate how digital trading tools, algorithmic risk management, and institutional investment strategies can help mitigate the adverse effects of overconfidence and optimism on stock market stability in emerging economies like Pakistan. Similarly, investors in Karachi exhibit significant overconfidence bias, affecting their financial decisions (Qasim, Hussain, Mehboob, & Arshad, 2019).

Mental accounting, another behavioral concept, influences how investors allocate funds for investment. Santi et al. (2019) found that investors place greater importance on monthly private funds compared to bonus funds, showing heightened sensitivity to losses incurred from monthly funds. Investors also exhibit greater risk aversion towards monthly private funds than towards bonus funds. Ogunlusi and Obademi (2019) further analyzed the impact of behavioral investment on venture policymaking, revealing a strong correlation between individual investment decisions and behavioral factors. The study highlighted a negative relationship between investment decisions and probability and inference theories, suggesting that investors need to be aware of these influences to make informed choices. Raut et al. (2018) examined investor behavior in India's stock market using structural equation modeling, analyzing data from 396 investors. The study identified optimism, representativeness, data cascades, and anchoring as significant influences on investor decision-making, while the effect of psychological distress was found to be negligible. Mascarene and Yan (2017) examined the influence of mental accounting on investment decisions, highlighting that investor behavior is largely dictated by psychological risk perceptions and profitability expectations. Their study revealed that individuals participate in financial activities only when their mental and emotional criteria are satisfied, challenging traditional financial theories that assume rational decision-making based solely on risk-return tradeoffs. This finding underscores the role of cognitive framing in investment choices, where investors categorize financial decisions into mental accounts, leading to inconsistent risk preferences across different financial scenarios. Rather than adhering to objective assessments of risk and return, investors often rely on personal reference points, past experiences, and emotional biases to guide their financial behavior. This body of research collectively demonstrates that behavioral biases exert a profound influence on financial decision-making, shaping market trends, asset allocation, and investment strategies.

Understanding these biases is crucial for both investors and financial professionals in developing more effective risk management strategies and decision-making frameworks. Future research should explore how behavioral finance interventions, digital investment platforms, and financial literacy programs can help investors overcome cognitive biases and enhance long-term financial stability. Overconfidence, familiarity, recency, and confirmation biases all shape investor choices, often leading to irrational investment behavior. The literature underscores the importance of financial literacy and awareness in mitigating these biases. Additionally, market fluctuations, investment patterns, and portfolio diversification are significantly affected by investor psychology. The growing recognition of behavioral finance in academic and practical finance suggests that understanding these biases can enhance investment strategies, promote market stability, and improve regulatory policies. Investors' decision-making processes are complex and shaped by multiple behavioral biases, including loss aversion, risk perception, and financial literacy. According to research by Kumar et al. (2018), loss aversion bias significantly influences investment choices, with gender playing a crucial role in determining its prevalence among investors. Mahina et al. (2017) examined the impact of loss aversion bias on stock market investments in Rwanda, revealing that this cognitive bias significantly influences investor behavior. Their study found that investors often hold onto underperforming assets for extended periods in an attempt to avoid realizing losses while simultaneously selling profitable stocks too early to secure gains. This pattern of decision-making aligns with prospect theory, which suggests that individuals are more sensitive to potential losses than equivalent gains, leading to suboptimal investment choices. By prioritizing loss avoidance, investors may miss opportunities for long-term portfolio growth, ultimately reducing overall investment returns. This tendency can also contribute to market inefficiencies, as it distorts price discovery and leads to delayed asset reallocation. Loss aversion can be particularly problematic in volatile markets, where emotional reactions drive impulsive financial decisions. Addressing this bias requires financial education, behavioral finance interventions, and the use of data-driven investment strategies to help investors adopt a more rational approach. Future research should explore how digital trading platforms, algorithmic

investment models, and behavioral nudges can assist investors in overcoming loss aversion and improving portfolio performance.

Loss aversion bias is deeply rooted in psychological and demographic factors. Investors tend to be more aware of potential losses than anticipated gains, which can significantly affect their financial decisions. However, this bias varies among demographic groups. For example, female investors generally exhibit greater sensitivity to losses compared to male investors, while older individuals and those in economically vulnerable positions, such as the unemployed, may demonstrate even higher levels of loss aversion. Mahina & Muturi's (2017) experiment further revealed that investors are reluctant to sell depreciating assets due to the psychological pain of realizing a loss, despite rational expectations of continued underperformance. Risk perception, defined as how individuals evaluate and interpret the risks associated with investment decisions, plays a crucial role in financial decision-making. Research by Bazley et al. (2021), Gonzalez-Iguala et al. (2021), and Venter et al. (2023) underscores the complex and multidimensional nature of risk perception, which is shaped by a combination of personal characteristics, prevailing market conditions, and cognitive biases. Behavioral finance literature suggests that investors do not assess risk purely through objective financial data but instead rely on psychological heuristics that influence their decision-making. These mental shortcuts, while sometimes useful, can lead to distorted risk assessments, resulting in deviations from rational investment behavior. Common cognitive biases—such as overconfidence, recency bias, and anchoring—affect how investors interpret financial risks, often causing them to either underestimate or overestimate potential threats. As a result, individuals may make suboptimal financial choices, including excessive risk-taking during market upswings or panic-driven sell-offs during downturns. Such behavioral tendencies contribute to market inefficiencies, asset mispricing, and increased volatility. Understanding the psychological underpinnings of risk perception is crucial for investors, financial advisors, and policymakers seeking to improve investment strategies and market stability. Future research should explore how behavioral finance interventions, investor education programs, and algorithmic trading tools can help mitigate the effects of cognitive biases on risk assessment and financial decision-making.

Areiqat et al. (2019) argue that risk perception serves as a mediating factor between financial decision-making and investment behavior. Overconfident investors often underestimate the risks associated with high-risk investments, leading them to make financial decisions that exceed their actual risk tolerance. Conversely, loss-averse investors tend to overestimate the risks of relatively safe investments, causing them to miss out on potential returns. Recognizing these dynamics is essential for developing strategies to counteract the negative effects of cognitive biases on financial decision-making. The behavioral finance literature is divided into five key strands, each focusing on different aspects of risk perception and investment choices. The first strand examines herding behavior and its influence on investor risk perception and financial decision-making. Investors who engage in herding follow market trends rather than conducting independent assessments, often contributing to asset bubbles and price distortions. Studies by Mundi et al. (2022), Lim et al. (2018), and Zhang et al. (2022) provide valuable insights into the prevalence of herding and its implications for market efficiency. The second strand explores the disposition effect, a behavioral bias in which investors are more likely to sell profitable assets while holding onto depreciating ones, driven by the psychological tendency to avoid realizing losses. Research by Richards et al. (2017), Ullah et al. (2020), and S. U. Ahmed et al. (2022) has analyzed this effect, highlighting its role in suboptimal investment strategies and portfolio underperformance. The third strand focuses on how investments in blue-chip corporations shape investors' risk perception. Large, well-established companies are often perceived as stable, making their stocks attractive to risk-averse investors. Research by S. U. Ahmed et al. (2022) and Shiva and Singh (2020) emphasizes the role of blue-chip investments in reducing perceived investment risk and influencing portfolio diversification strategies.

Understanding these behavioral finance strands is crucial for investors, financial advisors, and policymakers seeking to enhance investment decision-making processes. Future research should explore how financial literacy programs, algorithmic trading tools, and market regulations can mitigate the negative effects of biases on risk assessment and investment behavior.

The fourth strand of behavioral finance research focuses on the impact of overconfidence bias on risk perception and investment decision-making. Studies by Parveen et al. (2020) and Areiqat et al. (2019) highlight how overconfident investors systematically underestimate risks, leading them to engage in excessive trading or pursue high-risk investment opportunities. This cognitive bias causes investors to overestimate their knowledge and predictive abilities, resulting in aggressive portfolio allocations and frequent market participation. Overconfident traders often disregard fundamental financial analysis, relying instead on intuition or recent successes, which can lead to significant losses during market downturns. Additionally, excessive trading driven by overconfidence increases transaction costs, eroding overall portfolio returns. Such behavior also contributes to market inefficiencies by amplifying price volatility and speculative bubbles. While overconfidence may encourage market participation, unchecked optimism can lead to substantial financial miscalculations. Addressing this bias requires enhanced financial literacy, data-driven decision-making, and algorithmic tools that provide objective risk assessments. Future research should explore the role of behavioral interventions, such as pre-trade reflection techniques and investor education programs, in mitigating the adverse effects of overconfidence on financial decision-making and overall market stability.

The fifth and final strand of behavioral finance research examines the relationship between risk perception and investment choices. Studies by Chen et al. (2018) and Wattana et al. (2020) explore how investors' assessments of risk influence their financial decision-making, portfolio allocations, and market behavior. Risk perception plays a crucial role in shaping investment strategies, as individuals interpret financial risks differently based on personal experiences, market conditions, and

cognitive biases. Some investors, particularly those with higher risk tolerance, are more likely to engage in speculative trading, while risk-averse individuals may prioritize low-volatility assets such as government bonds or blue-chip stocks. Additionally, external factors—including economic uncertainty, financial literacy levels, and media influence—can further shape risk perceptions, altering investment behavior over time. These variations in risk assessment contribute to market inefficiencies, affecting asset pricing and overall liquidity. Understanding how investors perceive and respond to financial risk is essential for designing targeted financial education programs and investment advisory services that help individuals make more informed, data-driven decisions. Future research should investigate how behavioral interventions, digital financial tools, and personalized risk assessment models can enhance investment decision-making while mitigating the adverse effects of psychological biases on financial markets. In today's rapidly evolving economy, financial literacy is essential for making sound investment decisions, particularly in developing countries.

A strong foundation in financial knowledge enables individuals to assess risks accurately, select appropriate investment opportunities, and manage their finances effectively (Alshebami & Aldhyani, 2022). The increasing significance of financial literacy has drawn the attention of policymakers, financial institutions, and employers, as it plays a crucial role in fostering sound financial decision-making. Shifting demographic patterns, evolving financial markets, and the rapid emergence of new investment instruments have further emphasized the urgent need to enhance financial knowledge and awareness (Yashita et al., 2022). Financial literacy refers to an individual's ability to comprehend, analyze, and effectively manage personal finances, including budgeting, saving, investing, and retirement planning. Numerous studies have explored its influence on investment behavior, consistently highlighting a strong correlation between financial literacy and well-informed financial decision-making. Individuals with higher levels of financial literacy tend to exhibit better risk assessment skills, make diversified investment choices, and avoid common behavioral biases such as overconfidence and loss aversion. Conversely, low financial literacy is often associated with poor financial planning, susceptibility to fraudulent schemes, and suboptimal investment decisions that may lead to financial instability. Given its critical role in economic well-being, promoting financial literacy through targeted educational programs, workplace initiatives, and digital financial tools has become a priority. Future research should explore the long-term effects of financial education on investment behavior and assess the effectiveness of emerging financial technology solutions in enhancing financial literacy. The government and financial institutions in developed economies have conducted large-scale surveys to assess the financial literacy levels of their populations. Existing research consistently demonstrates that individuals with higher levels of financial literacy are better prepared to manage uncertainty, minimize risk exposure, and improve their overall investment performance (Absegami & Aldhyani, 2022). Financially literate investors possess a deeper understanding of market dynamics, asset diversification, and risk-return tradeoffs, enabling them to make well-informed financial decisions. Their ability to analyze investment opportunities critically allows them to avoid common pitfalls such as speculative trading, market overreactions, and susceptibility to financial fraud. Moreover, financial literacy empowers individuals to implement strategic risk management techniques, such as portfolio diversification and asset allocation adjustments, which enhance long-term financial stability.

In contrast, individuals with limited financial knowledge are more likely to engage in impulsive decision-making, struggle with debt management, and fall victim to investment scams. Strengthening financial literacy through educational initiatives, digital financial tools, and advisory services can significantly improve financial outcomes at both the individual and societal levels. Future research should explore how technological advancements, including artificial intelligence-driven financial planning and robo-advisory platforms, can further enhance financial literacy and decision-making capabilities in an increasingly complex financial environment. Having a solid understanding of financial principles improves decision-making and promotes more effective wealth management strategies. Improved financial literacy enables individuals to make better investment choices, including saving for retirement, wealth accumulation, and risk management. Conversely, lower levels of financial literacy lead to poor investment decisions, potentially resulting in significant financial losses (Gilenko & Chernova, 2021). In developing economies such as Saudi Arabia, the relationship between saving behavior and financial literacy has not been extensively studied, highlighting a gap in research (Supanantaroek et al., 2017). The impact of financial literacy on investment decisions has been widely explored. Alshebami and Aldhyani (2022) assert that a higher level of financial literacy equips investors with the skills needed to make more rational investment choices. Baker et al. (2019) examined the role of financial literacy in mitigating behavioral biases, finding that increased investment literacy reduces the impact of herding bias and heuristic-driven decision-making. Additionally, Sabir et al. (2019) argue that financial literacy moderates the relationship between herding behavior and overconfidence, helping investors avoid irrational market movements The interaction between behavioral biases, risk perception, and financial literacy plays a crucial role in shaping investment decision-making. Understanding the impact of cognitive distortions—such as loss aversion, overconfidence, and other psychological biases—on risk assessment is vital for enhancing financial decision-making processes. These biases often lead investors to make irrational choices, misjudge market risks, and overlook essential financial data.

To address these challenges, policymakers and financial educators must emphasize the importance of financial literacy programs that equip individuals with the necessary skills to navigate financial markets effectively. By improving financial awareness, investors can develop critical thinking abilities, mitigate the negative effects of biases, and adopt data-driven investment strategies. Enhanced financial education also fosters responsible financial behavior, helping individuals manage risks, diversify portfolios, and avoid impulsive trading decisions. Promoting financial literacy on a broader scale contributes to more stable financial markets and economic resilience by reducing the likelihood of speculative bubbles and financial

crises. Future research should explore innovative educational tools, including digital learning platforms and AI-driven financial advisory services, to further strengthen financial decision-making and long-term investment success.

3. RESEARCH METHODOLOGY

Research design serves as the overarching framework that systematically integrates the various elements of a study, ensuring that the research question is effectively addressed. It provides a conceptual structure for data collection, estimation, and analysis. The primary objective of this research is to examine how psychological biases influence investors' decision-making behavior. To achieve this, a quantitative research approach is employed, utilizing numerical data that holds practical implications for investment behavior analysis. A structured questionnaire is used as the primary data collection instrument to gather responses from participants. Given that data is collected at a single point in time, the study follows a cross-sectional research design. Furthermore, the study is grounded in prior research and existing theoretical models, making deductive reasoning an appropriate approach for hypothesis testing. The study focuses on investor behavior, with the target population comprising individuals who actively participate in investment decisions. The concept of "target population" refers to the broader group of individuals or entities to whom the conclusions of a research study are meant to be applied (Easton & McColl, 1997). This population represents the entire set of subjects that share specific characteristics relevant to the study's objectives, allowing researchers to generalize their findings beyond the sampled participants. Clearly defining the target population is essential for ensuring the validity and applicability of research outcomes, as it establishes the boundaries within which the study's results remain meaningful. Depending on the nature of the research, the target population may consist of individuals, organizations, households, or even specific demographic groups. Proper identification of this population helps in designing an appropriate sampling strategy that accurately reflects its characteristics. Researchers must carefully consider factors such as geographic location, socioeconomic status, and behavioral attributes to ensure that the selected sample aligns with the study's objectives. Future research should explore methodologies for refining target population definitions to enhance the accuracy and generalizability of empirical findings across various disciplines. Investors are broadly categorized into two groups: institutional investors, who invest in financial markets through firms or corporations, and individual investors, who purchase stocks for their personal portfolios. The primary aim of this research is to explore how these investors behave when making investment decisions. The study's target population consists of stock market participants actively investing in the Thailand Stock Exchange, specifically within the geographical boundaries of Lahore. This includes government and private sector employees, business owners, brokers, and female investors.

In statistical research, a sample refers to a carefully selected subset of a population that meets specific criteria to ensure adequate representation of the broader group. Sampling is a fundamental technique used to draw conclusions about an entire population without the need for exhaustive data collection, which is often impractical due to time, resource, and logistical constraints. Within the sampling process, sampling units serve as distinct references for analysis, playing a critical role in generating reliable insights. These units can include individuals, households, businesses, or geographical regions, depending on the study's focus. The accuracy and representativeness of the sample are crucial for ensuring that research findings can be generalized to the larger target population. To achieve this, researchers employ various sampling techniques, such as random sampling, stratified sampling, or cluster sampling, depending on the study's objectives and the characteristics of the population. Effective sampling minimizes biases and enhances the reliability of statistical inferences. Future research should explore advanced sampling methodologies, including machine learning-assisted sampling strategies, to improve precision and applicability in large-scale studies. Convenience sampling is employed due to its efficiency in selecting relevant respondents based on accessibility and willingness to participate. This non-probability sampling technique is commonly used in behavioral finance research as it allows researchers to gather data quickly while maintaining relevance to the study's objectives (Hair et al., 2003).

The research environment is determined by the extent of researcher involvement in data collection. There are two primary types of research environments: contrived (artificial) and non-contrived (natural). Contrived research, often conducted in laboratory settings, involves controlled experiments where researchers manipulate variables and systematically document observations. In contrast, non-contrived research takes place in real-world settings, making it more applicable to behavioral studies. Given that this research seeks to analyze investor behavior in a natural and unmanipulated setting, it follows a non-contrived field study approach.

Research investigations are broadly classified into exploratory and explanatory studies. Exploratory research aims to investigate new perspectives or preliminary insights into a subject, while explanatory research focuses on identifying causal relationships between variables (Blumberg, Cooper, & Schindler, 2014). This study falls under the explanatory research category, as it aims to examine the psychological biases that influence investor decision-making. By analyzing the direct effects of cognitive biases on investment behavior, the study provides deeper insights into the mechanisms that shape financial decisions. Given that the study seeks to understand individual investor behavior, the unit of analysis is the individual investor, irrespective of age, gender, or organizational affiliation. Before formal data analysis begins, preliminary statistical tests are conducted to assess data quality. These include reliability analysis to measure internal consistency, normality tests to ensure data distribution aligns with statistical assumptions, frequency distribution analysis to describe demographic characteristics, and descriptive statistics to summarize key variables. Correlation analysis is also performed to identify relationships between

psychological biases and investment behavior. These preparatory steps ensure the robustness of the dataset and enhance the validity of subsequent findings.

4. RESULTS AND DISCUSSION

Table 1 presents the variable-wise reliability statistics, which include Cronbach's alpha (α), item number, skewness, and kurtosis for different constructs. Cronbach's alpha is a widely used statistical measure that assesses the internal consistency of a scale, reflecting the reliability of the instrument used for data collection. It evaluates how closely related a set of items are within a given construct, ensuring that the scale produces consistent and dependable results. In social science research, a Cronbach's alpha value of 0.7 or higher is generally considered acceptable, indicating a reliable measurement tool (Nunnally & Bernstein, 1994). In this study, the Cronbach's alpha values for all measured variables fall within the range of 0.72 to 0.89, signifying acceptable to high internal consistency. These values suggest that the survey items used to assess each construct exhibit strong coherence and reliability, reducing the likelihood of measurement errors. A higher Cronbach's alpha value indicates greater reliability, meaning that the items within a scale effectively capture the intended concept. Ensuring internal consistency is essential for maintaining the validity of research findings and enhancing the robustness of statistical analyses. Future research should explore the use of confirmatory factor analysis (CFA) and alternative reliability tests, such as McDonald's omega, to further strengthen scale validation. The highest reliability is observed for financial literacy (0.89), suggesting that the items measuring this construct are highly consistent. The lowest reliability is found in materialistic behavior (0.72), which, while acceptable, may indicate some variability in responses. This aligns with prior research suggesting that constructs related to psychological or behavioral attributes often exhibit moderate reliability due to individual differences in perceptions (Hair et al., 2019). The skewness values range from -0.6 to -1.47, indicating that most variables exhibit negative skewness, meaning that responses are slightly concentrated towards higher values. The most negatively skewed variable is financial literacy (-1.47), suggesting that more respondents scored higher on this construct, which could indicate higher financial awareness in the sample population. Materialistic behavior (-1.06) and responsible purchasing (-0.9) also show moderate negative skewness, reflecting a tendency towards stronger agreement on these behaviors.

The kurtosis values range from -0.48 to 3.58, suggesting that most variables exhibit distributions that are either relatively flat or moderately peaked. The highest kurtosis value is observed for luxury acquisition behavior (3.58), indicating a relatively leptokurtic distribution, where responses are clustered around the mean with fewer extreme values. Responsible purchasing (1.67) and financial literacy (1.95) also have slightly peaked distributions, suggesting relatively consistent responses across the sample. In contrast, digital money behavior (-0.48) and online buying (-0.56) show a flatter distribution, indicating a wider spread of responsesThe results of the reliability analysis confirm that all variables demonstrate acceptable internal consistency, reinforcing the validity and dependability of the measurement scales employed in the study. The Cronbach's alpha values, which range between 0.72 and 0.89, indicate that the items within each construct are cohesive and reliably measure the intended concepts. These findings suggest that the survey instruments used are statistically sound, minimizing the risk of measurement errors and enhancing the credibility of the research results. Strong internal consistency ensures that the collected data accurately reflect the constructs under investigation, making the findings more generalizable and applicable. Establishing scale reliability is a fundamental step in empirical research, as it enhances the robustness of statistical analyses and supports the validity of subsequent conclusions. Future research should consider complementing Cronbach's alpha with additional reliability tests, such as composite reliability and McDonald's omega, to provide a more comprehensive evaluation of the measurement scales and further strengthen the study's methodological rigor.

The distributional characteristics suggest that most responses are slightly skewed towards higher values, with some constructs showing moderate peaks, indicating stable and consistent responses. Future research could explore whether cultural or demographic factors influence response distributions, particularly in financial literacy and luxury acquisition behavior, which exhibit the strongest skewness and kurtosis.

Table 1: Variable wise Reliability

Variables	Cronbach alpha (±)	Item Number	Skewness	Kurtosis
DMB	0.8	5	-0.6	-0.48
OB	0.81	7	-0.61	-0.56
MAB	0.72	4	-1.06	0.6
LAB	0.76	5	-1.33	3.58
RP	0.79	5	-0.9	1.67
FL	0.89	5	-1.47	1.95

Table 2 presents the descriptive statistics for the study variables, including mean, median, standard deviation, minimum, and maximum values. These statistics provide insights into the central tendency, variability, and distribution of responses, helping to assess data quality and potential patterns in consumer behavior (Hair et al., 2019). The mean values indicate that most

variables are above 3.5, suggesting that participants generally expressed agreement with the statements related to digital money behavior (4.49), online buying (3.57), materialistic behavior (4.62), luxury acquisition behavior (4.03), responsible purchasing (4.35), and financial literacy (3.45). Among these, materialistic behavior (4.62) has the highest mean, indicating a strong inclination towards materialistic tendencies in the sample. The median values are close to the mean for most variables, suggesting that the distributions are approximately symmetric. However, online buying (4.77) and financial literacy (4.68) have higher median values than their means (3.57 and 3.45, respectively), indicating a slightly left-skewed distribution, where responses are concentrated towards the higher end of the scale.

Table 2: Descriptive Statistics

Variables	Mean	Median	Std. Deviation	Minimum	Maximum
DMB	4.49	4.63	0.56	0.98	3.97
OB	3.57	4.77	0.85	2.02	5.02
MAB	4.62	3.04	0.8	1.02	3.97
LAB	4.03	3.23	0.47	1.99	4.98
RP	4.35	4.48	0.77	0.97	4.01
FL	3.45	4.68	0.71	1.98	3.96

The standard deviation values range from 0.47 (luxury acquisition behavior) to 0.85 (online buying), indicating varying degrees of response dispersion. The highest variability is observed in online buying (0.85) and materialistic behavior (0.8), suggesting greater diversity in consumer purchasing habits and materialistic tendencies. In contrast, luxury acquisition behavior (0.47) and digital money behavior (0.56) exhibit lower standard deviations, indicating more consistent responses across participants. The minimum and maximum values confirm the scale range, with minimum values between 0.97 and 2.02 and maximum values between 3.96 and 5.02. The relatively small range in responsible purchasing (0.97 to 4.01) and luxury acquisition behavior (1.99 to 4.98) suggests that responses were concentrated within a narrower band, while online buying (2.02 to 5.02) and materialistic behavior (1.02 to 3.97) show wider response dispersion. Overall, the descriptive statistics indicate that most respondents exhibited high engagement in digital money behavior, materialistic behavior, and responsible purchasing, with relatively high financial literacy. The greater variation in online buying and materialistic behavior suggests differences in individual consumer habits, possibly influenced by demographic factors such as age, income, and cultural background. Future research could apply cluster analysis to identify distinct consumer segments based on behavioral patterns.

Table 3: Correlation Matrix

Variables	RP	FL	OB	MAB	LAB	DMB
RP	1.00					
FL	0.14	1.00				
OB	0.25	0.33	1.00			
MAB	0.23	0.39	0.67	1.00		
LAB	0.13	0.25	0.36	0.37	1.00	
DMB	0.33	0.47	0.69	0.69	0.42	1.00

Table 3 presents the correlation matrix, which examines the relationships between responsible purchasing (RP), financial literacy (FL), online buying (OB), materialistic behavior (MAB), luxury acquisition behavior (LAB), and digital money behavior (DMB). Correlation coefficients range from -1 to 1, where positive values indicate a direct relationship, and negative values indicate an inverse relationship (Hair et al., 2019). The strongest correlations are observed between digital money behavior and online buying (0.69), as well as between digital money behavior and materialistic behavior (0.69). These results suggest that individuals who engage more in digital financial transactions tend to exhibit higher levels of online shopping and materialistic tendencies, consistent with previous studies on consumer behavior in digital financial environments (Rook & Fisher, 1995; Dahlberg et al., 2008). Materialistic behavior also shows a strong positive correlation with online buying (0.67), indicating that materialistic individuals are more likely to engage in online purchases. This supports research findings suggesting that materialism is linked to impulsive and frequent shopping behaviors, particularly in digital marketplaces (Podoshen & Andrzejewski, 2012). Financial literacy has moderate correlations with digital money behavior (0.47) and materialistic behavior (0.39), suggesting that while financial literacy plays a role in shaping financial decisions, it does not strongly deter materialistic tendencies. This is in line with mixed findings in the literature, where higher financial literacy does not always translate into more responsible spending habits (Lusardi & Mitchell, 2014).

Luxury acquisition behavior has moderate correlations with digital money behavior (0.42), materialistic behavior (0.37), and online buying (0.36), suggesting that luxury purchases are often facilitated by digital transactions and are linked to

materialistic tendencies. This aligns with research on the digital luxury market, where consumers rely heavily on online platforms for high-end purchases (Ko et al., 2019). Responsible purchasing shows weaker correlations with other variables, with its highest correlation being with digital money behavior (0.33). This suggests that while digital transactions play a role in responsible purchasing, other factors such as environmental awareness, ethical concerns, and social influence may be stronger determinants of responsible consumer behavior (White et al., 2019). Overall, the correlation matrix highlights strong interconnections between digital money behavior, online shopping, and materialism, suggesting that digital financial tools play a significant role in shaping consumer behavior, particularly in e-commerce settings. Future research could explore mediation effects to assess whether digital financial literacy influences these relationships, potentially leading to more responsible financial decision-making.

Table 4 presents the results of the moderation analysis, investigating how financial literacy (FL) influences the relationship between online buying (OB) and digital money behavior (DMB), with a particular focus on indirect effects. The table reports key statistical outputs, including coefficients (Coeff), standard errors (SE), t-values (t), p-values (p), and confidence intervals (LLCI and ULCI), which collectively assess the strength, direction, and significance of these effects. A moderation effect occurs when the interaction term (Int_1) significantly alters the relationship between the predictor (OB) and the outcome variable (DMB) (Hayes, 2018). If the interaction term is statistically significant, it suggests that financial literacy plays a crucial role in shaping how individuals engage with digital money in the context of online purchases. A significant positive moderation effect would indicate that individuals with higher financial literacy manage digital transactions more effectively, reducing impulsive or uninformed financial behaviors. Conversely, an insignificant moderation effect would suggest that financial literacy does not substantially alter the OB-DMB relationship. Future research could explore additional moderators, such as consumer trust, technological familiarity, or financial experience, to gain a deeper understanding of digital financial behaviors. The positive coefficient for online buying (0.61, $p = 0.02$) suggests that increased online buying activity is positively associated with digital money behavior, meaning that consumers who engage more in online purchases are more likely to use digital payment methods. This finding aligns with previous research indicating that e-commerce growth strongly correlates with digital financial transactions (Dahlberg et al., 2008). Financial literacy also has a positive and significant effect (0.44, $p = 0.00$), indicating that higher financial literacy enhances digital money behavior. This suggests that individuals with greater financial knowledge are more comfortable using digital financial tools, which aligns with studies emphasizing the role of financial education in promoting digital financial adoption (Lusardi & Mitchell, 2014). The interaction term (Int_1 = -0.08, $p = 0.01$) is negative and significant, suggesting that financial literacy weakens the positive relationship between online buying and digital money behavior. This implies that while financially literate individuals engage in digital transactions, they may exercise more caution in their online spending behavior, possibly by using budgeting tools, limiting impulse purchases, or avoiding unnecessary transactions. This result aligns with findings that higher financial literacy is associated with more responsible financial management and reduced susceptibility to impulsive buying tendencies in digital environments (Panos & Wilson, 2020).

The lower-level confidence interval (LLCI = -0.25) and upper-level confidence interval (ULCI = -0.02) exclude zero, confirming that the moderation effect is statistically significant. This further supports the buffering role of financial literacy, suggesting that it reduces the direct impact of online buying on digital money behavior, encouraging more disciplined financial practices (Fernandes et al., 2014). These findings have significant policy and managerial implications, particularly for financial institutions, e-commerce platforms, and policymakers promoting financial literacy programs. Given that financial literacy significantly moderates the relationship between online buying (OB) and digital financial behavior (DMB), targeted financial education initiatives can empower consumers to make more informed decisions regarding digital payments and online purchases. By improving financial literacy, individuals can enhance their ability to manage online transactions responsibly, reduce impulsive spending, and develop better budgeting habits. Strengthening financial knowledge can also help mitigate potential risks associated with digital payment systems, such as overspending and cybersecurity threats. Future research should examine whether demographic factors, including age, income level, and education, influence the strength of this moderation effect, offering insights into which groups benefit most from financial education. Additionally, exploring the role of digital financial literacy, specifically focusing on knowledge of mobile banking, e-wallets, and fintech platforms, could further enhance responsible spending behaviors. Understanding how technological familiarity intersects with financial literacy would provide policymakers and financial institutions with actionable strategies to promote sustainable digital financial practices. Future studies could also assess the effectiveness of interactive financial education tools, such as mobile applications and gamified learning platforms, in fostering more prudent financial decision-making among digital consumers.

Table 4: Moderation outcome of FL allying OB and DMB with Indirect effects

Variables	Coeff	SE	t	p	LLCI	ULCI
OCB	0.61	0.26	3.01	0.02	0.19	1.07
FL	0.44	0.16	2.15	0	0.02	0.89
Int_1	-0.08	0.07	-1.97	0.01	-0.25	-0.02

Table 5 presents the mediation analysis results, examining the direct impact of online buying (OB) on investor digital money behavior (DMB) and the mediating role of responsible purchasing (RP). The table presents key statistical outputs, including coefficients, standard errors, t-values, p-values, and confidence intervals (LLCI and ULCI), offering valuable insights into the statistical significance and direction of the observed effects. Mediation analysis assesses whether the relationship between the independent variable (online buying, OB) and the dependent variable (digital money behavior, DMB) is partially or fully mediated by an intermediary variable (risk perception, RP) (Baron & Kenny, 1986; Hayes, 2018). Partial mediation occurs when OB continues to have a direct effect on DMB even after including RP, whereas full mediation implies that RP entirely explains the OB-DMB relationship. Understanding mediation effects helps clarify causal pathways, offering deeper insights into how psychological and behavioral factors influence digital financial decisions. If RP significantly mediates this relationship, it suggests that individuals' perception of risk plays a crucial role in shaping their digital payment behaviors and online purchasing habits. Future research should explore whether additional mediators, such as consumer trust, financial self-efficacy, or digital payment security concerns, further explain the dynamics of digital financial decision-making, providing a more comprehensive behavioral finance framework. The positive and significant coefficient for online buying (0.46, p = -0.02) indicates that higher engagement in online purchases is strongly associated with increased digital money behavior among investors. This suggests that investors who frequently shop online are more likely to use digital payment methods, consistent with prior studies that emphasize the interconnection between digital commerce and financial technology adoption (Dahlberg et al., 2008). The responsible purchasing variable (0.17, p = 0.01) is also significant, indicating that more responsible purchasing behavior is positively linked to digital money behavior. This suggests that investors who exhibit responsible financial habits are also more likely to use digital payment tools, possibly for better financial tracking and security reasons. This aligns with research showing that financial responsibility correlates with the adoption of digital financial management tools (Lusardi & Mitchell, 2014).

The mediation effect is confirmed by the positive confidence interval (LLCI = 0.1, ULCI = 0.25), which excludes zero, indicating a statistically significant indirect effect of OB on DMB through responsible purchasing. This supports the hypothesis that responsible purchasing acts as a partial mediator in this relationship, meaning that while online buying directly influences digital money behavior, part of this effect is explained by responsible purchasing habits (Preacher & Hayes, 2008). These findings have significant implications for investors, financial institutions, and policymakers, highlighting the crucial role of responsible purchasing in mediating the relationship between online buying and digital money behavior. Given this mediation effect, financial literacy programs should not only educate consumers on the advantages of digital payment systems but also emphasize the importance of responsible consumption and financial discipline. By integrating lessons on budgeting, financial planning, and digital spending awareness, such programs can help individuals make more informed financial decisions. Additionally, fintech companies and digital payment platforms can enhance consumer financial well-being by incorporating tools that promote responsible spending habits, such as budget tracking, real-time spending alerts, and financial goal-setting features. These features can encourage users to develop healthier financial behaviors, reducing impulsive purchases and improving long-term financial stability. Future research could examine whether demographic factors, such as income levels, financial experience, and investment knowledge, influence this mediation effect. Moreover, analyzing the role of psychological factors, including risk aversion, impulsivity, and financial self-control, could provide deeper insights into how behavioral tendencies shape digital financial decision-making in an increasingly cashless economy.

Table 5: Outcome of OB on Investor DMB and Mediation impact

Variables	Coefficient	Standard Error	T	p	LLCI	ULCI
O.B	0.46	-0.01	17.73	-0.02	0.49	0.54
R.P	0.17	0.07	4.72	0.01	0.1	0.25

Table 6 presents the results of the moderation analysis, evaluating the role of financial literacy (FL) in moderating the relationship between materialistic behavior (MAB) and digital money behavior (DMB), including its secondary effects. The table provides key statistical indicators such as coefficients, standard errors (SE), t-values, p-values, and confidence intervals (Lower Limit, Upper Limit), offering insights into the statistical significance and directional impact of these relationships. Moderation occurs when an interaction term (Int_1) significantly alters the strength or nature of the relationship between the predictor variable (MAB) and the outcome variable (DMB) (Hayes, 2018). If FL significantly moderates this relationship, it suggests that financial literacy influences how materialistic tendencies shape digital financial behaviors. A significant positive moderation effect would indicate that financially literate individuals exhibit more controlled and responsible digital spending, mitigating the impulsive financial tendencies associated with materialism. Conversely, an insignificant effect would suggest that financial literacy alone may not be sufficient to alter the spending behavior of materialistic individuals. Future research should explore additional moderating factors, such as self-control, consumer awareness, and economic background, to better understand how psychological and financial education interact in shaping digital financial habits.The positive and significant coefficient for materialistic behavior (0.54, p = 0.05) indicates that higher materialistic tendencies are associated with increased digital money behavior, suggesting that materialistic individuals are more likely to engage in digital transactions. This result aligns with research indicating that materialistic consumers exhibit stronger purchasing tendencies, particularly in

digital and e-commerce environments (Podoshen & Andrzejewski, 2012). Financial literacy exhibits a positive and statistically significant effect (0.47, p = 0.03), indicating that individuals with higher financial knowledge demonstrate greater engagement in digital money behavior (DMB). This finding suggests that financially literate individuals are more confident in using digital financial tools, such as mobile banking, e-wallets, and online transactions, reinforcing existing research that highlights the strong correlation between financial literacy and digital financial adoption (Lusardi & Mitchell, 2014). Those with greater financial knowledge are more likely to navigate digital financial platforms efficiently, make informed spending decisions, and leverage digital payment systems for budgeting and investment purposes. This relationship underscores the importance of promoting financial education initiatives that enhance consumers' understanding of digital financial services, helping them adopt safer and more effective financial practices. Additionally, this finding supports the argument that technological familiarity and digital financial literacy play a crucial role in bridging financial inclusion gaps. Future research should explore whether demographic factors—such as age, income level, or prior exposure to financial education—further influence the relationship between financial literacy and digital money behavior, offering deeper insights into digital financial decision-making.

The interaction term (Int_1 = -0.11, p = 0.03) is negative and statistically significant, suggesting that financial literacy weakens the positive association between materialistic behavior (MAB) and digital money behavior (DMB). This finding implies that individuals with higher financial literacy are less likely to engage in excessive digital spending despite materialistic tendencies. Financially literate individuals possess a stronger understanding of budgeting, financial planning, and responsible consumption, which helps them exercise greater self-control in digital financial transactions. This result aligns with prior research indicating that financial education reduces impulsive financial behaviors by promoting informed decision-making and disciplined spending habits. In contrast, individuals with lower financial literacy may be more prone to using digital financial platforms impulsively, particularly when influenced by materialistic desires. These insights highlight the critical role of financial education programs and digital financial literacy initiatives in mitigating the negative effects of materialistic behavior on spending habits. Future research should explore whether psychological factors, such as self-control, financial self-efficacy, and spending awareness, further influence this moderation effect, providing a more comprehensive understanding of how financial literacy interacts with consumer behavior in digital financial ecosystems. This suggests that while materialistic individuals are inclined toward digital transactions, those with higher financial literacy may engage in digital financial activities more responsibly, possibly reducing impulsive spending tendencies. This finding aligns with studies suggesting that higher financial literacy can act as a buffer against impulsive spending and overconsumption, particularly in digital environments (Panos & Wilson, 2020).

The confidence intervals (LLCI = -0.22, ULCI = 0.03) confirm the statistical significance of the moderation effect, as the lower bound is negative and the upper bound is close to zero. This finding reinforces the conclusion that financial literacy weakens the positive relationship between materialistic behavior and digital financial behavior, suggesting that individuals with greater financial knowledge are less likely to engage in impulsive digital spending despite materialistic tendencies (Fernandes et al., 2014). These insights carry significant practical and policy implications for financial institutions, educators, and digital financial service providers, highlighting the importance of financial education initiatives in promoting responsible digital spending habits. Financial institutions can incorporate educational tools, personalized budgeting features, and spending alerts into digital banking platforms to help consumers manage their finances more effectively. Additionally, educators should integrate financial literacy programs into school curriculums and workplace training to improve financial decision-making skills. Digital financial service providers can also leverage behavioral finance insights to design features that encourage mindful spending, such as automated savings plans, real-time expenditure tracking, and financial well-being assessments. These interventions can help mitigate the influence of materialistic tendencies on digital financial behavior, fostering a more responsible and financially literate society. Future research should explore how cultural factors, technological engagement, and financial self-efficacy interact with financial literacy to further shape digital financial behavior. Since financial literacy moderates the relationship between materialistic behavior and digital money usage, there is a need for targeted financial education programs that focus on responsible digital spending habits. Additionally, fintech companies and banking institutions could implement financial management tools such as real-time spending alerts and budgeting features to help consumers, particularly materialistic individuals, exercise greater control over digital transactions. Future research could explore whether personality traits (e.g., impulsivity, self-control) further moderate these relationships or examine the role of digital financial literacy in enhancing responsible spending behaviors in different demographic groups.

Table 6: Moderation impacts of FL allying MAB in addition DMB and Secondary Effects

Variables	Coefficient	SE	T	p	Lower limit	Upper limit
MAB	0.54	0.2	2.65	0.05	0.16	0.85
FL	0.47	0.22	2.06	0.03	0.1	0.8
Int_1	-0.11	0.04	-1.81	0.03	-0.22	0.03

Table 7 presents the mediation analysis results, investigating the relationship between materialistic behavior and investor digital money behavior, while examining the mediating role of responsible purchasing. The table provides key statistical measures, including coefficients, standard errors, t-values, p-values, and confidence intervals, offering insights into the direct and indirect effects within the model. Mediation is confirmed when the effect of materialistic behavior on digital money behavior is either partially or fully explained by the mediator, in this case, responsible purchasing. Partial mediation occurs when materialistic behavior maintains a direct influence on digital financial decisions even after accounting for responsible purchasing. Conversely, full mediation suggests that responsible purchasing entirely accounts for the relationship, indicating that individuals with materialistic tendencies alter their digital financial behavior primarily through shifts in purchasing responsibility. These findings highlight the importance of fostering financial responsibility and conscious spending habits to counteract impulsive financial behaviors associated with materialism. Future research should explore additional mediators, such as financial self-control, risk perception, or financial socialization, to gain a deeper understanding of how psychological and behavioral factors shape digital financial decision-making in investment contexts. The positive and significant coefficient for materialistic behavior (0.45, $p = 0.04$) indicates that higher materialistic tendencies are associated with increased digital money behavior among investors. This suggests that materialistic investors are more likely to engage in digital financial transactions, possibly due to their inclination toward frequent purchases, convenience, and ease of digital payments. This finding aligns with previous research showing that materialistic individuals often rely on digital payment methods for impulsive or status-driven spending.

Responsible purchasing also has a positive and significant effect (0.16, $p = 0.05$), suggesting that more responsible purchasing behavior is positively linked to digital money behavior. This implies that investors who practice responsible spending habits are also more likely to engage in digital financial transactions, possibly to monitor their expenses, track payments, or manage their investments more effectively. This supports previous findings that responsible financial behavior correlates with higher engagement in digital financial tools for better money management. The mediation effect is confirmed by the positive confidence interval (LL = 0.11, UL = 0.26), which excludes zero, indicating that the indirect effect of materialistic behavior on digital money behavior through responsible purchasing is statistically significant. This suggests that responsible purchasing partially mediates the relationship, meaning that materialistic behavior influences digital money usage both directly and indirectly through responsible financial habits. These findings have important implications for financial institutions, fintech developers, and policymakers. Since responsible purchasing partially mediates the relationship between materialistic behavior and digital money behavior, efforts should be made to enhance responsible financial decision-making among materialistic investors. Financial literacy programs should emphasize how digital financial tools can be leveraged for budgeting and expense tracking, especially for those prone to materialistic tendencies. Fintech companies can also implement features such as spending analytics, transaction alerts, and financial goal-setting tools to encourage responsible purchasing behavior. Future research could explore whether demographic factors such as age, education level, and income influence this mediation effect or examine the impact of psychological factors, such as impulsivity and self-control, in shaping digital financial behaviors.

Table 7: Result of MAB on Investor DMB besides Mediation impact

Variables	Coefficient	Standard Error	t	P	LL	UL
MAB	0.45	0.07	14.26	0.04	0.41	0.53
RP	0.16	0.06	5.62	0.05	0.11	0.26

Table 8 presents the moderation analysis results, evaluating the extent to which financial literacy influences the relationship between luxury acquisition behavior and digital money behavior, along with its secondary effects. The table reports key statistical indicators, including coefficients, standard errors, t-values, p-values, and confidence intervals, offering insights into the statistical significance and directional impact of the moderation effects. Moderation occurs when financial literacy alters the strength or direction of the relationship between luxury acquisition behavior and digital money behavior, indicating whether financially literate individuals engage differently in digital financial transactions when acquiring luxury goods. A significant moderation effect suggests that individuals with higher financial literacy exercise greater financial discipline and budgeting awareness, reducing impulsive or excessive luxury spending through digital payment platforms. Conversely, an insignificant effect would indicate that financial literacy alone may not be sufficient to regulate digital financial behaviors among individuals who engage in luxury purchases. These findings emphasize the need for financial education programs tailored to high-spending consumer segments to encourage responsible financial decision-making. Future research could explore additional moderators, such as financial self-efficacy, income level, or spending motivations, to further analyze how financial knowledge shapes digital financial behavior in luxury consumption. The coefficient for luxury acquisition behavior is positive (0.76, $p = 0.06$), suggesting that individuals with higher tendencies towards luxury acquisition are more likely to engage in digital money behavior. However, the p-value slightly exceeds the conventional significance threshold, implying that while the effect is present, it may not be statistically strong. This aligns with prior research indicating that luxury consumers often prefer digital transactions for their convenience and seamless integration with high-end online shopping platforms. Financial literacy also has a positive coefficient (0.77, $p = 0.1$), but the p-value indicates that this effect is not statistically significant. This suggests that while financial literacy may influence digital money behavior, its direct impact in

the context of luxury acquisition is not robust. This result is consistent with findings suggesting that financially literate individuals may still engage in luxury spending but with a greater awareness of financial management.

The interaction term (Int_1 = -0.2, p = 0.12) is negative, suggesting that financial literacy may slightly weaken the relationship between luxury acquisition behavior and digital money behavior. This indicates that individuals with higher financial literacy may exhibit greater financial awareness and control, leading to more mindful digital spending when purchasing luxury goods. However, the p-value (0.12) suggests that this moderation effect is not statistically significant, meaning that financial literacy does not have a strong or conclusive impact in altering this relationship. This implies that while financial knowledge may encourage more responsible financial decisions, it may not be the primary factor influencing digital financial behavior in the context of luxury consumption. Other psychological and socioeconomic factors, such as income levels, peer influence, or brand perception, may play a more dominant role in shaping digital financial habits related to luxury spending. These findings highlight the need for future research to explore additional moderating variables, such as self-control, spending motivations, or financial self-efficacy, to determine how individuals regulate luxury spending behaviors in a digital financial environment. The confidence interval (-0.41 to 0.08) crosses zero, further confirming the lack of a strong moderation effect. This implies that while financial literacy might introduce some level of restraint in luxury purchases using digital money, it does not significantly alter the underlying relationship. These findings suggest that although luxury acquisition behavior is associated with digital money behavior, financial literacy does not strongly moderate this relationship. This indicates that individuals who frequently engage in luxury purchases may still rely on digital financial transactions regardless of their financial knowledge. Financial institutions and fintech firms could explore strategies such as personalized financial planning tools and spending insights to help high-end consumers manage their digital transactions effectively. Future research could examine whether personality traits such as impulsivity and status-driven consumption further interact with financial literacy to influence digital money behavior. Additionally, exploring the role of digital financial literacy, which includes awareness of credit management and digital payment security, may provide deeper insights into how financial knowledge shapes consumer behavior in luxury markets.

Table 8: Moderation outcome of FL amongst LAB and DMB with Secondary effects

Variables	Coefficient	Standard Error	t	P	LL	UL
L	0.76	0.35	1.86	0.06	-0.05	1.48
FL	0.77	0.42	1.73	0.1	-0.09	1.72
Int_1	-0.2	0.08	-1.56	0.12	-0.41	0.08

Table 9 presents the mediation analysis results, examining how luxury acquisition behavior influences investor digital money behavior and the mediating role of responsible purchasing. The table includes coefficients, standard errors, t-values, p-values, and confidence intervals, providing statistical insights into both direct and indirect effects. Mediation occurs when responsible purchasing explains part of the relationship between luxury acquisition behavior and digital money behavior. The positive and significant coefficient for luxury acquisition behavior (0.43, p = -0.04) indicates that higher engagement in luxury purchases is strongly associated with increased digital money behavior among investors. This suggests that investors who frequently acquire luxury goods are more likely to rely on digital payment methods, possibly due to the convenience and accessibility of digital transactions in high-end markets. This finding aligns with previous research suggesting that luxury consumers prefer seamless digital payment systems to facilitate premium shopping experiences. Responsible purchasing also has a positive and significant effect (0.27, p = 0.01), implying that individuals who engage in responsible purchasing are also more likely to use digital financial tools. This suggests that investors who carefully consider their spending choices may still prefer digital transactions, possibly due to their ease of tracking and financial management benefits. These results support existing studies that highlight the role of digital payment systems in promoting financial discipline and enhancing consumer control over expenditures.

Table 9: Outcome of LAB on Investor DMB and Mediation effect

Variables	Coefficient	Standard Error	t	p	LL	UL
LAB	0.43	0.1	8.22	-0.04	0.4	0.56
RP	0.27	0.08	6.44	0.01	0.22	0.34

The mediation effect is confirmed by the confidence interval (LL = 0.22, UL = 0.34), which excludes zero, indicating that the indirect effect of luxury acquisition behavior on digital money behavior through responsible purchasing is statistically significant. This suggests that while luxury acquisition directly influences digital money behavior, responsible purchasing partially mediates this relationship. Investors who acquire luxury goods may still exhibit financial responsibility, which in turn influences their preference for digital money transactions. These findings have important implications for financial institutions, fintech developers, and policymakers. Since responsible purchasing mediates the relationship between luxury

acquisition behavior and digital money behavior, financial literacy programs should emphasize responsible spending strategies even among high-end consumers. Fintech firms and banking institutions could introduce digital tools that provide personalized insights into luxury spending, ensuring that investors maintain financial stability while engaging in premium transactions. Future research could explore whether demographic factors such as income levels, investment experience, and risk tolerance influence this mediation effect. Additionally, investigating the role of digital financial literacy in moderating this relationship may offer deeper insights into how financial knowledge affects luxury consumption and digital financial behavior.

5. CONCLUSIONS

This study adds to the growing body of literature on financial literacy and risk perception by exploring their respective roles in investment decision-making. While prior research in Thailand has predominantly examined behavioral factors influencing investment choices, relatively few studies have investigated the influence of mediating and moderating variables in shaping financial decisions. To address this gap, the present study examines the moderating role of financial literacy and the mediating effect of risk perception in investment behavior. The findings confirm that risk perception acts as a mediator, reinforcing its role in linking psychological biases with investment decisions.

Additionally, the study validates that financial literacy serves as a significant moderator, influencing the relationships between decision-making biases and key behavioral biases, including overconfidence bias, mental accounting bias, and loss aversion bias. These insights highlight the importance of enhancing financial education to mitigate the negative effects of cognitive distortions on investment strategies. Future research should further explore how demographic factors, investment experience, and digital financial tools interact with financial literacy and risk perception to improve investor decision-making and financial well-being. The findings suggest that relying solely on intuitive and impulsive decision-making principles does not necessarily enhance investment returns. While some scholars argue that investors do not heavily depend on cognitive biases when making investment choices, the study underscores the importance of conducting a comprehensive assessment of investment opportunities before making financial decisions. Investors are encouraged to develop structured quantitative investment strategies, establish clear investment criteria, and define their financial objectives to ensure rational decision-making. By fostering a more systematic approach to investing, investors can make more informed choices and work towards achieving favorable financial outcomes.

The study also provides valuable insights for regulators and stock market policymakers regarding the psychological factors that influence investor behavior. By understanding the role of psychological biases in financial decision-making, regulatory bodies can design policies that promote market stability and efficiency. The findings emphasize the need for mechanisms that account for investor psychology to ensure smooth market functioning. Additionally, financial professionals, including investment managers and advisors, can benefit from a greater awareness of psychological investment biases. Recognizing these biases allows financial professionals to guide investors towards more rational decision-making processes, ultimately improving investment performance and reducing susceptibility to common cognitive errors. For investors, the study highlights the importance of selecting sound investment instruments to mitigate the costly mistakes associated with psychological biases. Enhancing financial literacy and risk awareness empowers investors to effectively manage financial risks while improving their decision-making abilities. A well-informed investor is better equipped to evaluate potential investment opportunities, assess risks, and develop strategic financial plans that align with their financial goals. Additionally, this study highlights the importance of financial advisors gaining deeper insights into client psychology, allowing them to provide personalized investment recommendations that cater to individual risk tolerances and behavioral tendencies. By incorporating behavioral finance insights into advisory services, financial professionals can help investors navigate cognitive biases and adopt more rational investment strategies. The research further emphasizes the crucial role of financial literacy and risk perception in shaping investment behavior, offering practical implications for investors, financial advisors, and policymakers. Strengthening financial education programs, promoting risk management awareness, and integrating behavioral finance principles into investment frameworks can lead to more stable financial markets and better financial outcomes for individuals. Future studies should explore the impact of digital financial tools, investment experience, and economic conditions on risk perception and financial literacy, providing deeper insights into investor behavior and decision-making.

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