The Impact of Financial Literacy, Investment Decision-Making, Risk Tolerance, and Behavioral Biases on Individual Investment Performance

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Article Info

ABSTRACT

This study investigates the influence of financial literacy, investment decision making, risk tolerance, and behavioral biases on individual investment performance among investors in Indonesia. Using a quantitative approach, data were collected from 200 respondents through a structured questionnaire using a 5-point Likert scale. The analysis was conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS 3). The results reveal that all four variables—financial literacy, investment decision making, risk tolerance, and behavioral biases—have a significant and positive effect on individual investment performance. Financial literacy and investment decision making emerged as the most dominant predictors, while risk tolerance and behavioral biases also contributed positively. These findings highlight the importance of enhancing financial knowledge, promoting structured decision-making, and managing psychological influences to improve investment outcomes. The study contributes to both the behavioral finance literature and practical financial education strategies in the Indonesian context.

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1. INTRODUCTION

In recent years, individual participation in financial markets has grown significantly in Indonesia, driven by the rise of digital investment platforms, financial technology, and increasing awareness of wealth-building opportunities. As more Indonesians take control of their own investments, understanding the factors influencing individual investment performance has become increasingly crucial, as portfolio management effectiveness directly impacts financial well-being and long-term economic security. This growth is shaped by several interrelated factors, including financial literacy, digital financial literacy (DFL), technological adoption, and personal financial management strategies. Financial literacy remains a pivotal determinant, with individuals possessing higher literacy levels tending to make more informed, goal-oriented investment decisions that lead to stronger portfolio outcomes [1], though the national average in Indonesia remains below global standards [2]. The

emergence of digital platforms has elevated the importance of DFL, which mediates spending, saving, and investing behaviors and thus directly impacts financial well-being; educational initiatives targeting DFL can improve investment outcomes [3]. Technological adoption, particularly among Gen Z, is also influential, as evidenced by the Technology Readiness Index (TRI) and Unified Theory of Acceptance and Use of Technology (UTAUT), which underscore how individual and technological motives shape investment intentions [4]. Furthermore, self-monitoring plays a vital role in encouraging disciplined and adaptive investment behavior, optimizing performance [1]. However, while fintech expands access to investments, it also brings potential risks such as unmanaged debt, reinforcing the need for holistic financial management that combines financial literacy with healthy financial habits [2].

Among the various factors affecting investment performance, financial literacy plays a foundational role by equipping investors with the ability to analyze risks, understand financial concepts, and make informed decisions; however, financial literacy alone does not guarantee successful outcomes, as investment performance is also shaped by decision-making processes, income levels, and financial behavior. Investors with strong financial knowledge are better able to evaluate information, interpret market signals, and align choices with personal financial goals, yet studies highlight that this competence must be complemented by other factors to enhance investment success. Financial literacy significantly influences investment decisions by enhancing one's ability to comprehend and manage financial terminology and concepts, which is crucial for making informed choices [5], [6]. Research has shown that financially literate individuals tend to achieve higher risk-adjusted returns, underlining the contribution of literacy to profitable outcomes [7]. However, financial behavior—such as disciplined saving and spending—also plays a key role in shaping investment decisions, working in tandem with financial knowledge [6], [8].

Additionally, income level determines one's capacity to invest and tolerance for risk, thus influencing investment decisions [8]. Despite its critical importance, financial literacy alone does not ensure optimal performance, as even knowledgeable investors may struggle with challenges like portfolio diversification and market volatility management, which require broader skill sets [7].

Furthermore, an individual's risk tolerance—their willingness to accept investment volatility and potential losses—has long been recognized as a critical determinant of portfolio strategy and asset selection, where high-risk tolerance often leads to the pursuit of higher returns, while low-risk tolerance may result in conservative choices that limit potential gains. However, beyond rational considerations, behavioral biases such as overconfidence, loss aversion, and herding behavior frequently distort investors' judgment, leading to suboptimal decisions even among well-informed individuals. These psychological tendencies can undermine logical decision-making and negatively impact investment outcomes, making it essential for investors to recognize and manage such biases. Overconfidence, for example, causes investors to overestimate their knowledge and forecasting ability, often resulting in excessive trading and elevated transaction costs that erode returns [9], [10]. Loss aversion reflects a tendency to fear losses more than valuing equivalent gains, prompting behaviors like prematurely selling winning assets or retaining losing ones irrationally [9], [10]. Herding behavior, or the inclination to follow the crowd, can further exacerbate market volatility and drive decisions unsupported by individual analysis [9], [11]. To mitigate these effects, strategies such as consulting diverse information sources, seeking professional financial advice, and conducting regular portfolio reviews are recommended, as they provide balanced perspectives, objective feedback, and adaptive investment practices aligned with changing market conditions [10].

Despite the increasing interest in personal finance and investment in Indonesia, empirical studies examining the interplay

between financial literacy, investment decision making, risk tolerance, behavioral biases, and their collective impact on individual investment performance remain limited.

2. LITERATURE REVIEW

2.1 Financial Literacy

Financial literacy is essential for improving investment performance, especially in Indonesia where financial products are increasingly complex and retail investor participation continues to grow. Individuals with strong financial knowledge are better equipped to diversify investments and avoid common pitfalls. [12]stresses the importance of financial literacy in managing complex financial instruments, while the 2008 financial crisis exposed the risks of widespread financial illiteracy and underscored the need for better financial education to support economic resilience [13]. In Indonesia, financial literacy has been shown to influence investment decisions, as observed among novice investors in Bengkulu [14]. [7] also found that knowledgeable investors tend to achieve better outcomes in managing their retirement plans. Despite its significance, financial literacy levels remain low, prompting calls for stronger policy initiatives to enhance financial understanding and well-being [15]. Moreover, the growing use of digital platforms brings new challenges, making digital financial literacy increasingly important for navigating online investments and addressing cybersecurity concerns [13].

2.2 Investment Decision Making

Investment decision-making is a complex process involving the evaluation of alternatives, risk assessment, and interpretation of financial information to align with investors' goals, which is particularly vital in volatile markets. Rational models highlight analytical thinking, risk-return analysis, and goal orientation as essential for effective performance. In Indonesia, differing decision-making capabilities among investors may contribute to varying portfolio outcomes. Investment decisions, being largely irreversible resource commitments for uncertain future gains, typically involve capital expenditures requiring upfront outlays [16]. This process is shaped by cognitive biases, risk tolerance, information asymmetry, and external factors like economic conditions, regulations, and geopolitical risks [17]. Portfolio optimization through strategic asset selection and distribution is key to enhancing returns while managing risk, using both empirical and theoretical frameworks [18]. Investment analysis relies on financial indicators such as earnings, cash flows, and past performance, supported by tools like financial ratios, time value of money, and capital budgeting techniques to facilitate informed decisions [19].

2.3 Risk Tolerance

Understanding individual differences in risk tolerance is essential for predicting investment behavior and outcomes, particularly in emerging markets like Indonesia. Risk tolerance— an investor's willingness to accept uncertainty and potential financial loss— is influenced by biological, demographic, and methodological factors. Brain structures such as the amygdala and prefrontal cortex play a key role in risk assessment, contributing to individual differences in financial behavior [20], while psychological traits like sensation-seeking are not directly linked to financial risk tolerance, affirming its distinct nature [21].Demographic factors such as age, gender, income, and education also shape risk perceptions and acceptance [22], with experienced investors tending to be more tolerant and comfortable with risk [21]. Methodologically, assessment tools like Financial Risk Tolerance (FRT) instruments and lottery-based models yield different results, with FRT often indicating greater risk aversion [23]. A holistic approach that views risk tolerance as a stable personality trait is

recommended to align investment strategies with actual risk capacity and reduce behavioral distortions [24].

2.4 Behavioral Bias

Behavioral finance deepens the understanding of investment behavior by incorporating psychological factors that influence decision-making, challenging the classical assumption of investor rationality. Cognitive biases such as overconfidence, herding, and loss aversion often lead to suboptimal decisions, particularly in volatile markets. In countries like Indonesia, these biases are common among retail investors who may lack financial education or professional advice, amplifying their negative effects and contributing to market inefficiencies. Overconfidence makes investors overrate their predictive skills, resulting in excessive trading and lower returns [9], [25]. Herding behavior, or blindly following the crowd, heightens market volatility, especially during uncertainty [26], [27]. Loss aversion, as explained in Prospect Theory, causes investors to fear losses more than they value gains, often leading to irrational asset management [9], [27]. To reduce these biases, behavioral nudges and AI-based advisory tools are increasingly applied to guide investors toward more rational decisions and enhance market stability [26].

2.5 Investment Performance

Investment performance is a multifaceted concept that includes portfolio return, asset growth, risk-adjusted return, and investor satisfaction, reflecting not only financial metrics but also the investor's knowledge, decision-making, risk attitude, and behavioral tendencies. While financial literacy is important, psychological and behavioral factors can still undermine investment outcomes, as emphasized by [28]. Measuring investment performance typically involves evaluating returns over set periods, accounting for deposits, withdrawals, and benchmarks [29], with tools like the Sharpe Ratio offering insight into the return-risk relationship beyond basic efficiency metrics [30]. Common methods include single-period, money-weighted, and time-weighted returns, often adjusted for fees, taxes, and currency effects [31]. Behavioral biases may distort decision-making and offset the benefits of financial knowledge [32], while the stochastic discount factor approach provides a theoretical framework for improving current performance assessment models [32]. Additionally, accurate performance evaluation must include risk considerations—absolute, downside, and relative—and performance attribution techniques that assess returns by security, segment, and value-added management decisions [31].

2.6 Theoretical Framework

This study is grounded in two main theoretical perspectives. First, Rational Choice Theory supports the notion that well-informed and analytical individuals make superior investment decisions. Second, Behavioral Finance Theory challenges this view by incorporating psychological limitations and cognitive biases into financial decision making. The integration of these theories allows for a comprehensive analysis of both rational and irrational determinants of investment performance.
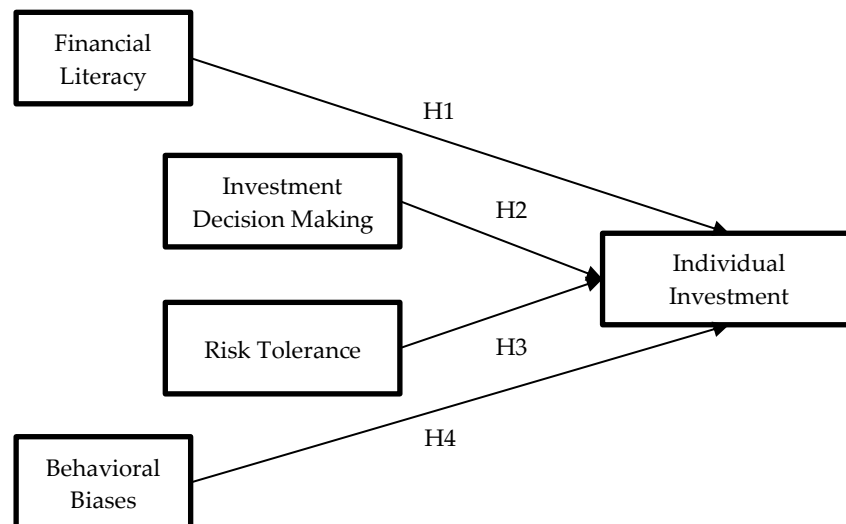
Figure 1. Conceptual and Hypothesis
Source: Literature Review, 2025

3. RESEARCH METHODS

This study employs a quantitative research design with a causal-explanatory approach to investigate the relationships between financial literacy, investment decision making, risk tolerance, and behavioral bias as independent variables, and individual investment performance as the dependent variable. Structural Equation Modeling–Partial Least Squares (SEM-PLS) is used to test hypotheses and examine the strength and direction of these relationships. The target population consists of individual investors in Indonesia actively engaged in investments such as stocks, mutual funds, or bonds. Using purposive sampling, 200 respondents were selected based on specific criteria: being 18 years or older, having at least one year of investment experience, residing in Indonesia, and voluntarily completing the research questionnaire. A sample of 200 is deemed sufficient for SEM-PLS, following the guideline of at least 10 times the number of indicators in the most complex construct [33].

Data collection was conducted through a structured online questionnaire disseminated via social media and online investment communities. The instrument used a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) and was divided into two parts: demographic data

(age, gender, income, education, investment experience, and type of investment) and research indicators measuring the five key constructs. A pilot test involving 30 respondents was first conducted to ensure the reliability and validity of the questionnaire. Each construct was measured using validated indicators adopted from prior research: Financial Literacy [7], Investment Decision Making [34], Risk Tolerance [35], Behavioral Bias [36], and Investment Performance [28], [37]. All constructs were assessed using Likert scales to capture respondents' agreement levels.

Data analysis was carried out using SmartPLS 3 software, which is suitable for exploratory studies and complex models involving multiple constructs. The analysis process began with descriptive statistics to summarize respondents' demographic profiles. This was followed by the evaluation of the outer model to assess measurement reliability and validity, including indicator reliability (factor loading > 0.7), construct reliability (Cronbach's Alpha and Composite Reliability > 0.7), convergent validity (AVE > 0.5), and discriminant validity (Fornell-Larcker criterion and HTMT ratio). The inner model evaluation then analyzed the structural relationships through path coefficients and their significance (t-statistic > 1.96), the coefficient of determination (R^2), predictive

relevance (Q²), effect size (f²), and model fit using the Standardized Root Mean Square Residual (SRMR < 0.08).

4. RESULTS AND DISCUSSION

4.1 Demographic Characteristics of Respondents

The demographic profile of the 200 respondents offers a comprehensive view of individual investors in Indonesia, encompassing gender, age, education, income, investment experience, and preferred investment instruments. In terms of gender, 60% were male and 40% female, aligning with general trends of higher male participation in investment. The age distribution shows that the majority (45%) were aged 26–35 years, followed by 18–25 years (25%), 36–45 years (20%), and above 45 years (10%), indicating a strong presence of millennials and early professionals in the investment landscape. Regarding education, 50% held a bachelor's degree, 30% postgraduate degrees, 15% diplomas, and 5% other qualifications, suggesting that higher education levels correlate with increased investment activity. Monthly

income levels varied, with 40% earning below IDR 5 million, 35% earning between IDR 5–10 million, and 25% earning above IDR 10 million, demonstrating that investment participation spans across income brackets. In terms of experience, 50% had invested for 2–5 years, 30% for less than 2 years, and 20% for more than 5 years, indicating a blend of novice and seasoned investors. As for investment types, 55% chose stocks, 30% mutual funds, 10% bonds, and 5% other instruments such as cryptocurrency and P2P lending, reflecting the prominence of equity-based investments in the Indonesian retail market.

4.2 Measurement Model Evaluation

The measurement model evaluation (outer model) assesses the validity and reliability of the constructs used in this study before evaluating the structural relationships between variables. This evaluation includes: (1) indicator reliability, (2) internal consistency reliability, (3) convergent validity, and (4) discriminant validity. The evaluation was conducted using SmartPLS 3.0.

Table 1. Model Reliability Results

Constructs	Indicators	LF	CA	CR	AVE
Financial Literacy	FL1: I understand the concept of compound interest.	0.816	0.889	0.919	0.697
	FL2: I can differentiate between interest rates and inflation.	0.907			
	FL3: I know how diversification helps reduce investment risk.	0.895			
	FL4: I am aware of the importance of long-term financial planning.	0.838			
	FL5: I can interpret basic financial reports or statements.	0.701			
Investment Decision Making	IDM1: I compare multiple investment products before making a decision.	0.878	0.871	0.906	0.661
	IDM2: I seek advice or consult others before investing.	0.879			
	IDM3: I rely on data and financial analysis rather than intuition when investing.	0.801			
	IDM4: I set specific and measurable investment goals.	0.772			
	IDM5: I consider both risk and return when making investment decisions.	0.723			

Constructs	Indicators	LF	CA	CR	AVE
Risk Tolerance	RT1: I am willing to accept short-term losses for long-term gains.	0.742	0.891	0.92	0.698
	RT2: I stay calm during sharp market downturns.	0.881			
	RT3: I am open to high-risk investments for the possibility of higher returns.	0.832			
	RT4: I do not panic and sell assets during market volatility.	0.858			
	RT5: I build my investment portfolio with a mix of moderate to high-risk assets.	0.858			
Behavioral Biases	BB1: I believe I can outperform the market with my investment strategy.	0.857	0.882	0.914	0.68
	BB2: I rarely doubt my own investment decisions.	0.811			
	BB3: I follow others' investment decisions without much analysis.	0.827			
	BB4: I invest in trending assets popular in the media or among peers	0.779			
	BB5: I fear losses more than I seek potential gains.	0.847			
Individual Investment Performance	IIP1: I am satisfied with the returns of my investments in the past year.	0.820	0.873	0.909	0.666
	IIP2: My investment portfolio has grown compared to the previous year.	0.712			
	IIP3: My investments align with my personal financial goals.	0.821			
	IIP4: I feel confident in the effectiveness of my investment strategy.	0.876			
	IIP5: I believe my investment outcomes are better than average.	0.843			

Source: Results of data analysis (2025)

The discussion confirms that the measurement model meets the quality thresholds recommended by [33], including factor loadings ≥ 0.70, Cronbach's Alpha (CA) ≥ 0.70, Composite Reliability (CR) ≥ 0.70, and Average Variance Extracted (AVE) ≥ 0.50, indicating robust reliability and validity across all constructs. For Financial Literacy, all indicators (FL1–FL5) show loadings between 0.701–0.907, with CA = 0.889, CR = 0.919, and AVE = 0.697, confirming high internal consistency and convergent validity. Investment Decision Making also demonstrates strong loadings (0.723–0.879), CA = 0.871, CR = 0.906, and AVE = 0.661, indicating a well-measured construct. Similarly, Risk Tolerance shows loadings of 0.742–0.881, CA = 0.891, CR = 0.920, and AVE = 0.698, confirming its reliability. The Behavioral Bias construct is measured effectively with loadings between 0.779–0.857, CA =

0.882, CR = 0.914, and AVE = 0.680, capturing key psychological dimensions like overconfidence, herding, and loss aversion. Finally, Individual Investment Performance is validated with loadings of 0.712–0.876, CA = 0.873, CR = 0.909, and AVE = 0.666, confirming that it reliably measures satisfaction, growth, goal alignment, confidence, and perceived performance. All constructs in the model thus demonstrate strong indicator contributions, internal consistency, and convergent validity.

Variance Inflation Factor (VIF) measures the extent to which the variance of an estimated regression coefficient increases due to multicollinearity among predictors. According to [33], VIF values below 3.3 indicate ideal conditions with low multicollinearity, values between 3.3 and 5.0 suggest moderate but acceptable multicollinearity, while values above 5.0 indicate problematic levels that may

distort the reliability of the regression estimates.

Table 2. VIF Internal

Variable	Individual Investment Performance
Behavioral Biases	3.326
Financial Literacy	3.535
Investment Decision Making	3.269
Risk Tolerance	3.467

Source: primary data processing by author's (2025)

All VIF values in the model range from 3.269 to 3.535, which, although slightly above 3, remain well below the threshold of 5, indicating that there is no serious multicollinearity among the independent variables. These moderately elevated VIF values suggest some interrelationship among predictors—common in behavioral finance research—but not to a degree that would bias or inflate the regression estimates. Discriminant validity was further assessed using the Fornell-Larcker Criterion, which requires that the square root of each construct's AVE be greater than its correlations with other constructs, ensuring that each construct is distinct and well differentiated from others in the model.

Table 3. Validity for Discrimination

Variable	Behavioral Biases	Financial Literacy	Individual Investment Performance	Investment Decision Making	Risk Tolerance
Behavioral Biases	0.825				
Financial Literacy	0.896	0.835			
Individual Investment Performance	0.817	0.907	0.816		
Investment Decision Making	0.782	0.78	0.924	0.813	
Risk Tolerance	0.809	0.766	0.746	0.78	0.836

Source: primary data processing by author's (2023)

All diagonal values (square roots of AVE) are greater than the off-diagonal correlations, satisfying Fornell-Larcker discriminant validity.
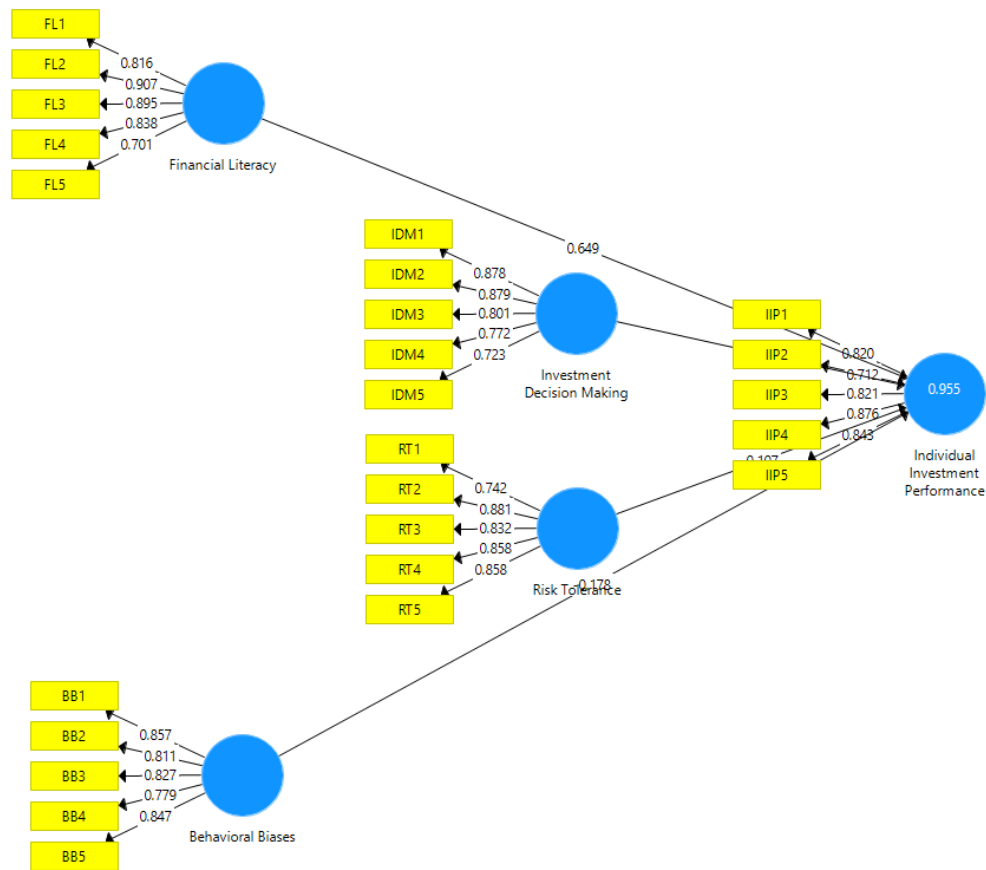
Figure 2. Hypothesis for the Internal Research Model

The coefficient of determination (R²) indicates how much variance in the endogenous variable—investment performance—is explained by the exogenous variables: financial literacy, investment decision making, risk tolerance, and behavioral bias. The R² value for investment performance is 0.637, meaning that 63.7% of its variance is accounted for by the model, which, according to Chin (1998), demonstrates substantial explanatory power. Additionally, the model's predictive relevance was assessed using the Q² value derived from the blindfolding procedure. With a Q² value of 0.428 for investment performance, the model shows strong predictive accuracy, as values greater than zero indicate meaningful predictive relevance.

4.3 Hypothesis Testing Discussion

The hypothesis testing in this study was performed using the bootstrapping method with 5,000 resamples in SmartPLS 3, generating outputs including the Original Sample (O), Sample Mean (M), Standard Deviation (STDEV), T-statistics, and p-values. The significance of each path coefficient was evaluated based on standard thresholds, where a T-statistic greater than 1.96 and a p-value less than 0.05 indicate statistical significance at the 95% confidence level.

Table 4. Hypothesis Test Results

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-statistic	p-Values	Results
Behavioral Biases -> Individual Investment Performance	0.478	0.478	0.054	3.326	0.001	Accepted

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-statistic	p-Values	Results
Financial Literacy -> Individual Investment Performance	0.649	0.647	0.06	10.746	0.000	Accepted
Investment Decision Making -> Individual Investment Performance	0.641	0.638	0.04	15.876	0.000	Accepted
Risk Tolerance -> Individual Investment Performance	0.307	0.402	0.045	2.396	0.003	Accepted

Source: primary data processing by author's (2025)

The hypothesis testing results reveal several significant relationships between the independent variables and individual investment performance. H1 shows that behavioral biases have a positive and significant effect on investment performance (O = 0.478, T = 3.326, p = 0.001), which, contrary to conventional expectations, may suggest that in the Indonesian context, certain biases such as overconfidence might lead to risk-taking behaviors that yield favorable outcomes; nonetheless, the potential mediating or moderating role of these biases warrants further exploration. H2 confirms that financial literacy is a dominant predictor of investment success (O = 0.649, T = 10.746, p = 0.000), reinforcing that investor who grasp concepts like diversification, inflation, and financial planning tend to align their decisions more effectively with their goals. H3 reveals that investment decision making also has a strong, positive, and highly significant effect (O = 0.641, T = 15.876, p = 0.000), supporting the view that strategic, data-driven, and goal-oriented decisions improve investment outcomes. Lastly, H4 indicates a positive yet comparatively weaker relationship between risk tolerance and investment performance (O = 0.307, T = 2.396, p = 0.003), suggesting that investors willing to accept higher levels of risk may be better positioned to achieve superior returns, particularly within volatile or emerging markets like Indonesia.

4.4 Discussion

a. Financial Literacy and Investment Performance

The study confirms a strong and significant positive relationship between financial literacy and individual investment performance, consistent with previous findings by [7] and [38]. Financially literate investors are better equipped to grasp key concepts such as inflation, diversification, compound interest, and long-term planning, enabling them to assess investment options more effectively, avoid common errors, and construct resilient portfolios. In Indonesia—where digital platforms have broadened access to investment—financial literacy serves as a critical safeguard against impulsive decisions, fraud, and poor financial judgment. Empirical evidence supports this link across various contexts: research at the IDX investment gallery of Muhammadiyah University of Makassar revealed that financial literacy significantly influences investment decisions [6], while a study in Banjarmasin highlighted that individuals with higher financial literacy tend to make more goal-oriented choices [1]. Similarly, findings from PT ASABRI in East Java affirmed the role of financial literacy in shaping personal finance decisions [8]. Moreover, financial literacy also

protects investors from fraudulent schemes, as shown in a study at PT. Indotech Scientific, where it was found to positively influence decisions alongside income by reducing susceptibility to illegal investments [39]. Supporting this, [40] demonstrated that financial literacy enables individuals to better assess risk and return, aligning their investment behavior with sound financial principles.

b. **Investment Decision Making and Investment Performance**

The analysis reveals a significant and positive relationship between investment decision making and investment performance, reinforcing previous studies by [34] and [41], which suggest that systematic, data-driven approaches lead to better portfolio outcomes. Investors who compare options, define clear financial goals, and rely on fundamental analysis rather than intuition or peer influence tend to achieve superior results. In the Indonesian context, where many retail investors depend heavily on social media or informal advice, this emphasizes the need for structured decision-making frameworks and professional guidance to enhance investment discipline and long-term success. Decision-making is also shaped by cognitive biases, risk tolerance, and external factors such as economic conditions and regulatory changes, which must be addressed to support sound financial behavior [17]. Tools like financial ratios, time value of money, and portfolio analysis play a crucial role in evaluating past performance and managing risk [19]. Financial literacy and investment experience further support rational decision-making, although overconfidence can weaken this relationship, indicating the importance of maintaining a balanced mindset [42]. Fundamental analysis is widely used by Indonesian investors and has been positively linked with investment success [43]; such investors are typically more aspirational, take greater risks, and often outperform those who rely solely on technical analysis [44].

c. **Risk Tolerance and Investment Performance**

The relationship between risk tolerance and investment performance is positive and significant, supporting the risk-return trade-off theory and findings by [35], which highlight that investors who can endure short-term volatility are more likely to achieve higher long-term gains. In emerging markets like Indonesia, higher risk tolerance encourages investment in equities, digital assets, and diversified portfolios that typically yield better returns than traditional low-risk instruments. However, the moderate effect size suggests that risk tolerance alone is not sufficient; it must be complemented by financial literacy and sound decision-making to optimize outcomes. Research shows that emerging markets exhibit a positive risk-return trade-off during stable periods, but this relationship weakens during market turbulence, emphasizing that risk tolerance is more effective under stable conditions [45]. Advanced models like the Regime Switching-GARCH better capture the nonlinear dynamics of these markets. Furthermore, individuals with higher risk tolerance are more inclined to invest in high-risk assets [46], but the benefits of such behavior are significantly enhanced when paired with financial knowledge and rational strategies [47]. Risk tolerance is also dynamic, fluctuating with market returns—rising in bullish conditions and falling in downturns—which may lead to suboptimal behaviors like buying high and selling low [48].

d. Behavioral Biases and Investment Performance

Contrary to many prior studies in behavioral finance [49], this study finds that behavioral biases have a positive and significant influence on investment performance, suggesting that certain biases may, under specific market conditions, contribute to favorable outcomes. Overconfidence, for example, can prompt decisive action during periods of uncertainty, while herding behavior may allow investors to benefit from upward trends in momentum-driven markets [50], [51]. Similarly, the affect heuristic has been shown to positively influence investment performance among Indian and U.S. investors, indicating that emotional reactions can sometimes align with profitable decisions [50]. However, this positive impact should be interpreted with caution, as the long-term effects of biases like anchoring and mental accounting have been found to negatively affect performance, particularly among Indian investors [50]. Disposition effect and overconfidence may also become detrimental over time, especially in the U.S. context, by encouraging the retention of losing investments or overestimation of market knowledge [50]. Importantly, financial literacy plays a moderating role by mitigating the negative effects of biases—such as anchoring in India and affect heuristic in the U.S.—and enhancing decision quality [50], [52]. Therefore, while some behavioral tendencies may yield short-term gains, they should not replace sound financial judgment, and education in behavioral finance remains essential for sustainable investment success.

e. Theoretical and Practical Implications

Theoretically, the findings of this study bridge rational decision-making theories, such as Modern Portfolio Theory, with behavioral finance perspectives, creating a more comprehensive model of the factors that drive individual investment performance. The significant influence of both cognitive and psychological variables underscores the importance of integrating these dimensions when modeling investor behavior. Practically, the results offer several actionable insights: financial educators should intensify literacy programs, especially for young and first-time investors; investment platforms and advisors are encouraged to implement risk profiling tools and structured decision-making guides; behavioral coaching or nudges can be employed to reduce the negative impact of biases while still allowing room for investor intuition; and regulators and market participants should promote responsible investing through educational tools, transparent disclosures, and public awareness initiatives.

f. Limitations and Future Research

Despite its strong findings, this study has several limitations. The use of cross-sectional data restricts the ability to observe changes in investor behavior over time, and the sample size of 200 respondents may not fully capture the diversity of investor segments across Indonesia. Additionally, the study does not examine potential moderating or mediating variables such as gender, income level, platform type, or emotional intelligence, which could influence the relationships among the studied constructs. Future research is encouraged to adopt longitudinal designs, investigate behavioral mediation effects, or compare investment behavior across various asset classes such as cryptocurrency, real estate, or ESG-based instruments. Experimental approaches may also

offer deeper insights into how financial literacy interacts with behavioral biases during real-time decision-making processes.

5. CONCLUSION

This research concludes that individual investment performance in Indonesia is significantly influenced by a combination of cognitive and behavioral factors. Financial literacy emerges as the most influential variable, indicating that investors who possess a solid understanding of financial principles are more likely to make informed and effective decisions. Investment decision making also plays a vital role, highlighting the importance of disciplined, goal-oriented, and data-driven strategies in achieving investment success. Risk tolerance contributes positively, though to a lesser extent, suggesting that investors who are comfortable with volatility and open to taking risks tend to realize higher potential returns.

Interestingly, behavioral biases—often linked to poor outcomes—also show a significant positive relationship with investment performance in this context, possibly due to situational factors in emerging markets like Indonesia, where confidence and trend-following behaviors may sometimes align with profitable conditions. These findings suggest that a balanced investment approach—one that combines strong financial knowledge, rational decision-making, measured risk-taking, and behavioral awareness—can enhance outcomes. The study recommends expanding financial education, incorporating behavioral coaching, and developing personalized risk assessment tools to support investor success. Future research should pursue longitudinal designs to track behavioral shifts over time, examine moderating variables such as demographics and platform preferences, and investigate how newer investment categories like digital assets and ESG-focused instruments influence investor behavior.

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