

**AFFILIATION:**

1,2,3Universitas Internasional Batam

***CORRESPONDENCE :**

hery.haryanto@uib.edu

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Behavioral Biases and Crypto Investment Decision: Moderating Influence of Financial Literacy in Indonesia

Hery Haryanto¹, Larventy³, Johny Budiman³

Abstract

Main Purpose - This research investigates how behavioral biases influence cryptocurrency investment decisions among Indonesian investors, with financial literacy as a moderating variable.

Method - A quantitative approach was adopted using data from 520 active cryptocurrency investors in Indonesia collected through convenience-sampled online questionnaires. PLS-SEM was used to evaluate the proposed reflective measurement model and hypothesized structural relationships.

Main Findings - Overconfidence, anchoring, mental accounting, loss aversion, and regret aversion significantly have positive effect on investment decisions, while herding behavior and representativeness yielded non-significant results. Financial literacy moderated only the relationships between overconfidence and loss aversion with investment decisions.

Theory and Practical Implications - By integrating seven cognitive and emotional biases alongside financial literacy as a moderator, this study advances behavioral finance theory and underscores the strategic value of investor education in curbing bias-driven decision-making in speculative digital markets.

Novelty - Departing from single-bias and traditional-market research traditions, this study constructs an integrated seven-bias framework and rigorously tests the boundary conditions imposed by financial literacy.

Keywords: Behavioral Finance, Cryptocurrency, Financial Literacy, Investment Decision, PLS-SEM

Abstrak

Tujuan Utama – Penelitian ini menganalisis pengaruh bias perilaku terhadap keputusan investasi cryptocurrency pada investor Indonesia dengan literasi keuangan sebagai variabel moderasi.

Metode – Penelitian ini menggunakan desain kuantitatif, dengan data yang dikumpulkan dari 520 investor cryptocurrency aktif di seluruh Indonesia melalui kuesioner online berbasis convenience sampling. PLS-SEM digunakan untuk menguji model pengukuran reflektif yang diusulkan serta hubungan struktural yang dihipotesiskan.

Temuan Utama – Overconfidence, anchoring, mental accounting, loss aversion, dan regret aversion masing-masing memberikan pengaruh positif yang signifikan secara statistik terhadap keputusan investasi; sementara herding behavior dan representativeness menunjukkan hasil yang tidak signifikan. Literasi keuangan hanya memoderasi hubungan antara overconfidence dan loss aversion terhadap keputusan investasi.

Implikasi Teori dan Kebijakan – Dengan mengintegrasikan tujuh bias perilaku dan literasi keuangan sebagai moderator, studi ini memperluas kajian behavioral finance serta menekankan pentingnya edukasi investor dalam mengurangi keputusan investasi yang dipengaruhi bias pada pasar digital spekulatif.

Kebaruhan Penelitian – Berbeda dari tradisi penelitian yang berfokus pada satu bias atau pasar tradisional, penelitian ini membangun kerangka terintegrasi yang mencakup tujuh bias dan menguji secara rigor batasan-batasan yang ditentukan oleh literasi keuangan.

Kata Kunci: Perilaku Keuangan, Mata Uang Kripto, Literasi Keuangan, Keputusan Investasi, PLS-SEM

INTRODUCTION

The rapid growth of financial technology over the past decade has supported the development of cryptocurrency as a new alternative investment instrument, attracting significant attention in Indonesia (Arriqoh & Zoraya, 2024; Prasetyo & Kurniasari, 2023). As of 2024, the global cryptocurrency market capitalization reached approximately USD 3.26 trillion, with Bitcoin as the largest contributor (CoinMarketCap, 2024). In Indonesia, the growing public confidence in cryptocurrency trading is reflected in the significant rise in transaction value. As reported by BAPPEBTI, the total value of cryptocurrency assets trading in Indonesia was IDR 556.53 trillion between January and November 2024, amounting to a 356.16% increase from IDR 122 trillion in the corresponding period in the previous year (BAPPEBTI, 2024). The rise is attributable to technological innovations and the prospect of high profits; but it comes at the expense of exposure to great risks caused by extremely volatile prices and market instability (Garcia et al., 2014).

This risk involved in cryptocurrency investment is evidenced by various incidents experienced in cryptocurrency markets. The TerraUSD and LUNA project failure in May 2022 (Liu et al., 2023) and the subsequent FTX bankruptcy in November 2022 (KPMG, 2022) provide a clear example of how poor financial decisions made by investors lacking proper financial knowledge could lead to huge losses and reduce investor confidence in cryptocurrencies.

From the perspective of behavioral bias, cryptocurrency investments are influenced by numerous forms of cognitive biases, such as herding, representativeness, anchoring, overconfidence, loss aversion, mental accounting, and regret aversion (Almansour et al., 2023; Fadillah et al., 2025; Kaur et al., 2024; Sood et al., 2025; Vukovic & Mateljan, 2025). Such biases can result in judgment distortions that adversely affect investment decisions, especially in markets characterized by high degrees of speculation, such as cryptocurrencies.

In terms of behavioral biases, financial literacy plays an essential role in forming the investors' response to these cognitive tendencies. People who have more financial literacy are able to analyze information, estimate risks adequately, and make more informed decisions about their investments (Adil et al., 2022; Chen et al., 2023). Although there is an increasing number of studies confirming that financial literacy mitigates the impact of cognitive biases (Chen et al., 2023; Fanta & Mutsonziwa, 2021), the results of empirical analyses show some inconsistency. Specifically, in 2024, the financial literacy rate in Indonesia was estimated at approximately 65.43%, which may contribute to increased vulnerability to biases and irrational decision-making in cryptocurrency investments (OJK, 2024).

While there have been numerous studies undertaken in relation to behavioral biases and investment decision-making, several gaps remain in the current body of literature. Previous studies have largely examined behavioral biases in isolation rather than considering their combined influence within a single investment decision context (Almansour et al., 2023; Handoko et al., 2026; Kaur et al., 2024; Marheni, Jenny, & Agustin, 2023; Sood et al., 2025). Moreover, the literature has predominantly focused on traditional financial markets, leaving the highly volatile and speculative nature of cryptocurrency markets relatively underexplored (Bihari et al., 2025; Budiman et al., 2025; Mahmood et al., 2024). Although financial literacy has been widely examined for its direct influence on investment behavior, its potential moderating role in mitigating the effects of behavioral biases has received comparatively limited attention (Adil et al., 2022; Budiman et al., 2025; Mahmood et al., 2024). These limitations are further evident in the Indonesian context, where empirical research on behavioral biases and financial literacy among cryptocurrency investors remains relatively limited (Fadillah et al., 2025; Fadli et al., 2024; Marheni et al., 2023). Taken together, these gaps indicate that the joint influence of multiple biases in a highly speculative, comparatively unregulated market such as Indonesian cryptocurrency, moderated by investors' financial literacy, has not yet been adequately tested, despite clear theoretical grounds, drawn from Heuristics-and-Biases Theory and Prospect Theory, for expecting financial literacy to shape how these biases translate into investment choices.

Accordingly, this study examines the influence of herding, overconfidence, representativeness, anchoring, mental accounting, loss aversion, and regret aversion on cryptocurrency investment decisions among Indonesian investors, with financial literacy as a moderating variable. Its contribution lies not merely in combining multiple biases or in studying the Indonesian market as a, but in testing whether financial literacy performs its theoretically expected protective function under the specific conditions of a young, high-volatility, largely self-regulated asset class in which price-reference information is unusually visible and retail participation is dominated by socially networked, community-driven trading (via platforms such as Telegram and Discord). This setting allows the study to examine whether the bias-mitigating role commonly attributed to financial literacy in conventional markets also holds, or breaks down, in a market structure that differs sharply from the ones in which that role has typically been documented.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Herding, Heuristic, and Prospect Theory

The evolution of financial theory saw the emergence of behavioral finance, which recognizes that investments are not always made rationally. In this regard, behavioral finance takes into consideration psychological aspects in order to give a more realistic explanation for investment behavior. (Oruganti et al., 2025; Shefrin & Statman, 1985; Tversky & Kahneman, 1972, Tversky & Kahneman 1974, Tversky & Kahneman 1979, Tversky & Kahneman 1991)

These concepts form the basis of the above framework, which are mainly Herding Theory, Heuristics and Biases Theory, and Prospect Theory. According to Herding Theory, investors usually herd because of information asymmetry and social pressure, hence the irrationality of some market behavior (Devenow & Welch, 1996; Ding & Li, 2019). Under Heuristics and Biases Theory, the process through which individuals simplify their thinking process in order to make decisions during uncertainty can lead to systematic errors like overconfidence, representativeness, and anchoring (Dias et al., 2019; Hjeij & Vilks, 2023; Tversky & Kahneman, 1974). On the other hand, under Prospect Theory, people make decisions using a reference point and they are loss-averse, meaning that losses are valued more than gains of equal magnitudes (Tversky & Kahneman, 1979, Tversky & Kahneman 1991). Besides, other related concepts include mental accounting and regret aversion since they play a role in how investors feel about their gains and losses as well as decision making (Loomes & Sugden, 1982; Thaler, 1985).

Investment Decision

Investment decision refers to the process of selecting among various investment alternatives in order to achieve optimal returns within an acceptable level of risk (Bodie et al., 2014). Within the framework of traditional finance theory, investment decisions are assumed to be rational and utility-maximizing (Fama et al., 1969; Markowitz, 1952). However, behavioral finance demonstrates that such decisions are frequently shaped by psychological biases and cognitive limitations (Tversky & Kahneman, 1979). In the context of cryptocurrency, investment decision tend to be more speculative in nature, given the pronounced volatility, limited regulatory oversight, and persistent information asymmetry that characterize this market conditions that collectively render investors more susceptible to behavioral biases (Almansour et al., 2023).

Herding Behavior and Investment Decision

Herding behavior describes the tendency of investors to follow the actions of others when faced with uncertainty, which can result in irrational investment decision (Devenow & Welch, 1996; Mahmood et al., 2024). Such behavior is often triggered as a result of asymmetric information and social influence, especially during times of market instability, and is especially notable in markets involving speculation, like that of cryptocurrency, which often provide confusing price indicators (Srivastava et al., 2025). Unlike traditional investments, cryptocurrency operates in a highly

speculative and decentralized environment, which can heighten the influence of social cues and emotional responses on investment decisions (Islam et al., 2024). When investors prioritize the behavior of the crowd over independent analysis, they may make investment decisions that deviate from rational judgment. This tendency can be further reinforced by fear of missing out (FOMO), causing investors to follow prevailing market trends rather than conduct independent evaluations of an asset (Gupta & Shrivastava, 2022). A growing body of empirical evidence supports a positive relationship between herding behavior and investment decision. For instance, Abdeldayem & Aldulaimi (2024) find a significant positive association between herding behavior and investment decision among investors in GCC countries. Consistent findings are reported by Kartini and Nahda (2021), Rahyuda and Candradewi (2023), and (Arriqoh & Zoraya, 2024) which demonstrate a significant and positive effect of herding on investment decision in the Indonesian context.

H1: Herding behavior has a positive and significant effect on investment decision.

Overconfidence and Investment Decision

Overconfidence is defined as the state in which people believe in themselves more than what their actual knowledge and predictive capabilities about market trends entail (Altaf & Jan, 2023; Ricciardi & Simon, 2000). In the behavioral finance literature, overconfidence has been associated with related concepts such as the better-than-average effect, illusion of control, miscalibration, and unrealistic optimism, all of which reflect an individual's tendency to overestimate their own abilities or the accuracy of their judgments (Glaser & Weber, 2017; Kaur et al., 2024). Due to this bias, individuals become overly confident in their judgment, and underestimate the size of potential losses (Altaf & Jan, 2023; Jain et al., 2022). In cryptocurrency markets, this tendency may become more pronounced during periods of strong price increases, which individuals may perceived their gains as evidence of superior knowledge than others and invest more into cryptocurrency (Iamin, 2025). There are several studies indicating the positive impact of overconfidence on the process of making investment decisions (Kaur et al., 2024; Mahmood et al., 2024; Nurbarani & Soepriyanto, 2022)

H2: Overconfidence has a positive and significant effect on investment decision.

Representativeness and Investment Decision

Representativeness bias is defined as the psychological inclination among people who determine probability through the resemblance to historical data, instead of basing their judgment on statistical facts (Ahmad et al., 2025; Tversky & Kahneman, 1972). As a result, investors use past experiences in judging investment options, disregarding fundamentals of investing and the conditions prevailing within the market (Hafez, 2021). In general, representativeness bias causes investors to buy securities that were successful in the recent past and refrain from trading in the securities that underperformed in the past a form of overreaction, which may distort judgment (Ahmad et al., 2025). With regard to cryptocurrencies, where large amounts of market information and historical price movements are readily observable, representativeness bias may become more pronounced as investors rely on mental shortcuts to process information rapidly (Handoko et al., 2026). Handoko et al (2026) further indicate that heuristic biases, including representativeness, significantly influence investor behavior in cryptocurrency trading, particularly when market fluctuations and rapid information dissemination increase investors' reliance on cognitive shortcuts. Several studies provide empirical evidence for the strong and positive correlation between representativeness bias and investors' choices (Gurung et al., 2024; Kartini & Nahda, 2021; Shahzad et al., 2024; Yasmin & Ferdaous, 2023).

H3: Representativeness has a positive and significant effect on investment decision.

Anchoring and Investment Decision

Anchoring is a cognitive process through which people make decision based on the first information available in an uncertain situation (Tversky & Kahneman, 1974). With regards to investment,

the anchoring process can occur whereby the investor makes a reference to the initial cost of acquisition or even the maximum price that has been reached during history (Tversky & Kahneman, 1974). Investors may also rely on limited information, such as recent news, trading volume, or past price movements, as reference points when making investment decisions (Jain et al., 2022). This then determines whether the person buys or sells investments. People who make decisions based on a reference value will be less capable of making adjustments based on the new information available, resulting in systematic mistakes (Mahmood et al., 2024). In highly volatile cryptocurrency markets, investors may anchor their expectations to previously observed price conditions or perceptions of cryptocurrency as a safe-haven asset and fail to sufficiently adjust their judgments when new information becomes available, potentially leading to distorted investment decisions (Popova et al., 2025). Research findings show that anchoring has a positive and significant effect on investment decision (Ahmad et al., 2025; Gurung et al., 2024; Kartini & Nahda, 2021; Srivastava et al., 2025).

H4: Anchoring has a positive and significant effect on investment decision.

Mental Accounting and Investment Decision

Mental accounting is the phenomenon that occurs in the form of cognitive predisposition for investors to evaluate their financial actions individually rather than as part of one whole portfolio (Thaler, 1985). Mental accountants tend to allocate their money to different mental accounts depending on the origin or destination of the funds, resulting in inappropriate investment choices and asset management (Heath & Soll, 1996). The common example of mental accounting is the evaluation of losses and gains in relation to their cost of acquisition, which affects portfolio development and asset management practices (Shefrin & Statman, 1985). In the context of cryptocurrency investment, Indonesian investors may apply mental accounting by separating and evaluating their cryptocurrency funds as distinct financial categories, which can influence their investment decision-making (Ginting et al., 2023). Moreover, the unique characteristics of cryptocurrency as a digital asset may strengthen mental accounting because investors tend to mentally segregate cryptocurrency from everyday spending and perceive it as a distinct store of wealth (de Almeida et al., 2026). In cryptocurrency trading where investments can be made at different price points through various platforms, the investor's cognitive predispositions related to mental accounting might cause further irrational compartmentalization and unwillingness to sell underperforming assets. Research proves that there is a direct correlation between greater proneness to mental accounting among investors and increased risk sensitivity, which has a positive impact on investment decisions (Adiputra et al., 2024; Bai, 2023).

H5: Mental accounting has a positive and significant effect on investment decision.

Loss Aversion and Investment Decision

Under the context of prospect theory, the concept of loss aversion is used to describe the phenomenon whereby people tend to feel more pain in case of losses as compared to the joy in equivalent gains (Tversky & Kahneman, 1979, Tversky & Kahneman 1991). The differential sensitivity of people to outcomes causes them to avoid taking up losses as well as booking their profits prematurely. This is a common cause of poor decision-making when managing a portfolio and often causes investors to keep losing positions longer than they should while exiting winning positions much earlier than they need to. The tendency is referred to as the disposition effect (Shefrin & Statman, 1985). In cryptocurrency markets, loss aversion may become more pronounced because high volatility and uncertainty make investment valuation more difficult and increase investors' sensitivity to negative market movements (Skwarek, 2025). Furthermore, previous evidence indicates that individual investors' cryptocurrency decisions are influenced by loss aversion, particularly when investors continue to hold declining assets to avoid realizing losses (Kaur et al., 2024). Extensive research shows that loss aversion plays an essential role in influencing the decisions made by investors (Ahmad et al., 2025; Bihari et al., 2025; Handoko et al., 2026; Hossain & Siddiqua, 2024).

H6: Loss aversion has a positive and significant effect on investment decision.

Regret Aversion and Investment Decision

Regret aversion refers to the inclination of an individual towards avoiding decision-making scenarios that might result in feelings of regret in the future, leading to delays and conservative approaches towards investments (Bihari et al., 2025; Loomes & Sugden, 1982). This bias operates through the anticipated emotional outcomes of regret and disappointment that an individual expects as a consequence of making a decision under conditions of uncertainty (Bleichrodt & Wakker, 2015); rather than reacting to outcomes after they occur, investors pre-emptively shape their decisions around the emotions they expect to feel if those decisions turn out badly. This anticipatory mechanism becomes especially consequential when investors face unfavorable outcomes or potential losses, as recent evidence shows regret aversion shaping investor behavior differently across market conditions (Kim & Ohk, 2025). Consequently, investors affected by regret aversion could decide not to sell assets that underperform because of reluctance to realize losses or sell off profit-making positions for fear of experiencing regret later. Within the highly volatile field of cryptocurrency trading, where reversals frequently occur, the anticipation of these emotions would have a considerable impact on decision-making. Research consistently supports the existence of a positive and statistically significant effect of regret aversion on investment decisions (Bihari et al., 2025; Gurung et al., 2024; Hafez, 2021)

H7: Regret aversion has a positive and significant effect on investment decision.

Financial Literacy and Investment Decision

Financial literacy can be defined as the capability to understand and use financial information to make sound economic decisions (Lusardi & Mitchell, 2014). Sufficient financial literacy allows one to assess risks associated with different investments, use financial tools effectively, and refrain from rash decisions (Klapper et al., 2015). In behavioral finance, financial literacy is regarded as an essential moderating variable since it affects investor's reaction to certain behavioral biases (Adil et al., 2022; Chen et al., 2023). Individuals with high financial literacy have the ability to process market data in a rational way and make appropriate choices based on this information without resorting to heuristic methods and emotions. There is evidence that financial literacy can reduce the effect of behavioral biases on the investment choice made (Budiman et al., 2025; Gulzar et al., 2024). Finances literate investors pay more attention to their own analytical assessment compared to market trends or personal impressions. Moreover, having adequate financial knowledge helps individuals assess possible risks and financial consequences of certain actions. However, several studies report inconsistent findings, suggesting that financial literacy may not always significantly moderate the relationship between behavioral biases and investment decisions (Mahmood et al., 2024; Reddy et al., 2026). These inconsistent results indicate that the moderating role of financial literacy remains an important issue for further investigation, particularly in the context of cryptocurrency investment decisions.

H8: Financial literacy weakens the effect of herding behavior on investment decisions.

H9: Financial literacy weakens the effect of overconfidence on investment decisions.

H10: Financial literacy weakens the effect of representativeness bias on investment decisions.

H11: Financial literacy weakens the effect of anchoring bias on investment decisions.

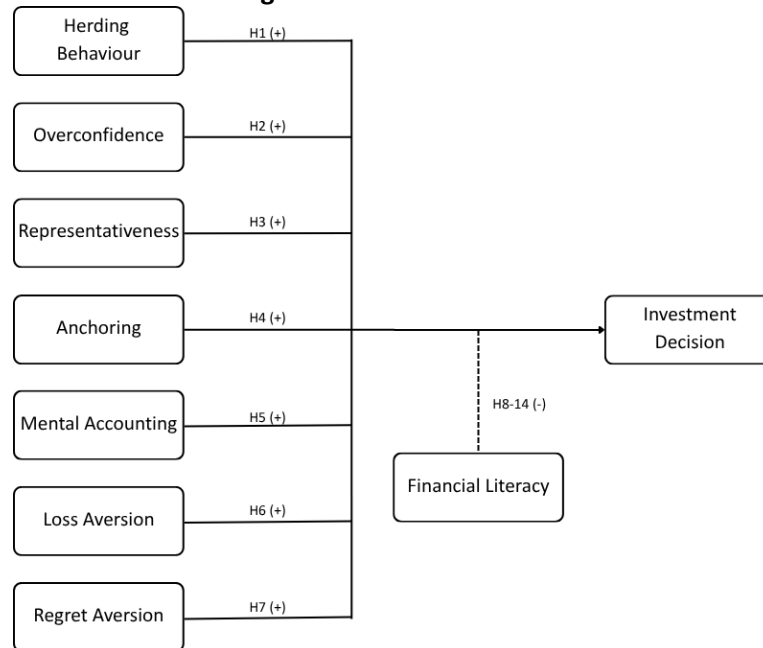
H12: Financial literacy weakens the effect of mental accounting on investment decisions

H13: Financial literacy weakens the effect of loss aversion on investment decisions

H14: Financial literacy weakens the effect of regret aversion on investment decisions.

Referring to the explanation above, this study proposes an expanded research model examining Investment Decision as the dependent variable, influenced by behavioral finance factors—namely Herding Behavior, Overconfidence, Representativeness, Anchoring, Mental Accounting, Loss Aversion, and Regret Aversion—as independent variables, whereas financial literacy functions as a moderating variable, as shown in Figure 1.

Figure 1. Research Model



Source: Author, 2025

RESEARCH METHOD

The study population consists of Indonesian individuals who have actively invested in cryptocurrency. Respondents were required to have direct, personal experience in cryptocurrency investment, thereby excluding individuals with only passive or indirect exposure. Convenience sampling technique was applied whereby the participants involved were selected based on their accessibility and willingness to take part in the study. Data collection was carried out between 26 November 2025 and 8 April 2026 through distribution of the questionnaire via Google Forms among cryptocurrency communities and networks in Indonesia using Telegram and Discord groups as well as investment networks in general. The determination of the minimum sample size needed is done by applying the recommendation given in (Hair et al., 2017) where the suggested sample size for SEM is 10 times the number of the indicators. As there are 41 indicators altogether, the minimum sample size needed is 410. However, this research was able to collect a total of 600 samples, with 520 valid samples used for further analysis.

In this study, the methodology of Partial Least Squares Structural Equation Modeling (PLS-SEM) is applied for analyzing the data which is appropriate for studying complicated associations between several variables including the moderating effect on those associations. The applicability of PLS-SEM can be justified by the ability of the model to cope with both reflective measurement models and complex structural relationships, offering efficient parameter estimation and high statistical power (Hair et al., 2017). The survey in this research is divided into two basic components: information about the respondent's demographics and measurement items evaluated on a scale of 1 ("strongly disagree") to 5 ("strongly agree"). The independent variables are Herding Behavior (HB), Overconfidence (OV), Representativeness (RE), Anchoring (AN), Mental Accounting (MA), Loss Aversion (LA), and Regret Aversion (RA), whereas the dependent variable is Investment Decision (ID). Financial Literacy (FL) works as a moderator. The operational definitions and measurement items of all variables are presented in Table 1.

Table 1. Variable Measurement

Variable	Indicator	Reference
Herding Behavior (HB)	HB1: I follow other investors' choices when deciding which cryptocurrencies to invest in. HB2: I consider other investors' decisions regarding cryptocurrency trading volume when making investment decisions. HB3: I follow other investors' decisions to buy and sell cryptocurrencies when making investment decisions. HB4: I quickly adapt to adjustments in other investors' decisions and more likely to follow their behavior in the cryptocurrency market.	Fadli et al. (2024), Kaur et al. (2024), Vukovic & Mateljan (2025)
Overconfidence (OV)	OV1: I believe that my capability and knowledge in the crypto market can lead to better-than-market performance. OV2: I am aware of the optimal timing for entering and exiting my investment positions in the crypto market. OV3: I rely more on my own investment opinions than on those of people around me. OV4: I trade in cryptocurrency more frequently compared to other investors.	Kaur et al. (2024)
Representativeness (RE)	RE1: I buy cryptocurrencies that are currently trending and avoid those that have performed poorly in the past. RE2: I use trend analysis of several cryptocurrencies that represent the market to make investment decisions for all the cryptocurrencies I own. RE3: I buy cryptocurrency because I believe it has attractive characteristics or qualities. RE4: I rely only depend on selective and limited informational sources when investing. RE5: I tend to hold cryptocurrencies that best represent the evidence or information I believe in.	Shahzad et al. (2024)
Anchoring (AN)	AN1: I rely on my previous investment experiences when making decisions. AN2: I anticipate the changes in cryptocurrency prices in the future based on recent crypto prices AN3: I invest in cryptocurrencies mainly because of the expectation of high returns. AN4: I believe that high returns in the market are caused by excessive trading activity in cryptocurrency. AN5: I estimate prices by relying on an initial value.	Shahzad et al, 2024

Mental Accounting (MA)	MA1: I am reluctant to sell crypto assets that previously yielded high returns, even though their prices are currently declining. MA2: I do not consider the overall performance of my investment portfolio, but focus on returns from each individual account. MA3: I incline to evaluate each component of my investment portfolio separately. MA4: I tend to disregard the relationship between risk and return in my investments.	Budiman et al. (2025)
Loss Aversion (LA)	LA1: I consider investment losses more important than missed investment gains. LA2: I feel anxious when the value of my cryptocurrency investments decreases significantly. LA3: I avoid increasing my cryptocurrency investments when market conditions are unfavorable. LA4: I keep cryptocurrencies that have declined in value and sell cryptocurrencies that have increased in value.	Hossain & Siddiqua (2024)
Regret Aversion (RA)	RA1: I feel upset after selling profitable cryptocurrencies when I still hold other losing crypto assets that have not been sold. RA2: If the price of a cryptocurrency I sold continues to rise, I feel regret and disappointment. RA3: I avoid purchasing cryptocurrencies that I consider to be obviously overvalued. RA4: I sell profitable cryptocurrencies because I am afraid their prices will decline again. RA5: I am willing to pay additional money to obtain extra benefits from cryptocurrency investments. RA6: I hold my investments because I believe that prices will soon revert.	Wangzhou et al. (2021), Yasmin & Ferdaous (2023)
Financial Literacy (FL)	FL1: I believe I have a good overall understanding of financial matters. FL2: I am familiar with investment-related knowledge. FL3: I feel confident in my ability to make investment decisions.	Wangzhou et al. (2021)
Investment Decision (ID)	ID1: I feel satisfied with the cryptocurrency investment decisions I make. ID2: I believe that I make accurate cryptocurrency investment decisions. ID3: I achieve cryptocurrency investment returns that are higher than average market returns. ID4: I make all of my cryptocurrency investment decisions independently. ID5: I consider the returns from my crypto portfolio to be sufficient justification for my investment decisions.	Kaur et al. (2024)

Source: Authors (2026)

RESULTS

Descriptive demographic statistics of the questionnaire respondents are displayed in Table 2. Out of 520 respondents, more than half were male (56.92%), while females made up 43.08%. The largest age group comprised those aged 26–35 years (59.81%), while the next age category was 18-25 years (35.77%) and older than 35 years (4.42%). Thus, cryptocurrency investments in Indonesia mainly consist of young and middle-aged people who are actively employed and are likely to be easily attracted to digital financial products. As for the level of education, the largest share consisted of respondents with senior high school degrees (39.23%), followed by undergraduate/post-graduates (30.77%) and diploma holders (29.81%), with a very small number of respondents having only secondary school diplomas (0.19%). Most respondents (76.92%) worked in the private sector, followed by civil servants (10.96%), entrepreneurs (9.62%), non-employed (2.31%) and students (0.19%). Monthly income was primarily in the range of IDR 5,000,000-10,000,000 (82.50%), implying a demographic similar to that of the Indonesian working class. Of note is that most respondents (59.07%) stated that they have had cryptocurrency investment experience for more than three years, with another 19.31% investing for two to three years. Therefore, a high share of cryptocurrency experts improves the validity of self-reported answers.

Table 2. Descriptive Demographic Statistics of Respondents

Characteristic	Criteria	Frequency	Percentage
Gender	Female	224	43.08%
	Male	296	56.92%
Age	18 - 25 years	186	35.77%
	26 - 35 years	311	59.81%
	>35 years	23	4.42%
Education	Secondary school	1	0.19%
	Senior high school	204	39.23%
	Graduated (S1/S2/S3)	160	30.77%
	Diploma (D1/D2/D3)	155	29.81%
Occupation	Student	1	0.19%
	Private employee	400	76.92%
	Civil servant	57	10.96%
	Entrepreneur	50	9.62%
	Not Working	12	2.31%
Monthly Income (IDR)	< Rp5.000.000	49	9.42%
	Rp5.000.000 - Rp10.000.000	429	82.50%
	Rp10.000.000 - Rp15.000.000	32	6.16%
	> Rp15.000.000	10	1.92%
Experience in Investing in Cryptocurrency	< 1 year	46	8.88%
	1-2 years	66	12.74%
	2-3 years	100	19.31%
	>3 years	306	59.07%

Source: Data Processed (2026)

According to the test findings, the Variance Inflation Factor (VIF) varied from 1.856 to 3.244. The VIF values for all the variables fell well short of the generally acceptable VIF threshold of 5. This means there was no presence of multicollinearity in this research. Of the variables in this study, Regret

Aversion had the highest VIF value of 3.244, followed by Mental Accounting (3.135) and Financial Literacy (3.054).

Table 3. Collinearity Statistic

	VIF
AN -> ID	2.633
FL -> ID	3.054
HB -> ID	2.093
LA -> ID	2.531
MA -> ID	3.135
OV -> ID	1.856
RA -> ID	3.244
RE -> ID	2.504

Source: Data Processed (2026)

The validity through convergent validity was measured based on the outer loadings and the AVEs of the measures for each of the constructs as shown in Table 4. The criterion for validity through the convergent validity is that the loading must exceed 0.70 while the criterion for adequacy of convergent validity is that the AVE must exceed 0.50 (Hair et al., 2017). Meanwhile, internal consistency reliability was determined based on the criteria of having Cronbach's Alpha and Composite Reliability that are greater than 0.70 (Hair et al., 2017). It should be observed that all constructs have satisfied the criteria for validity and reliability as demonstrated in Table 4.

Table 4. Validity and Reliability Test

Variables	Indicator	Outer Loading	AVE	Cronbach Alpha	Composite Reliability
AN	AN1	0.805	0.610	0.840	0.842
	AN2	0.817			
	AN3	0.741			
	AN4	0.727			
	AN5	0.810			
FL	FL1	0.761	0.647	0.728	0.732
	FL2	0.829			
	FL3	0.822			
HB	HB1	0.818	0.639	0.812	0.813
	HB2	0.771			
	HB3	0.803			
	HB4	0.807			
ID	ID1	0.784	0.550	0.795	0.798
	ID2	0.738			
	ID3	0.718			
	ID4	0.744			
	ID5	0.722			
LA	LA1	0.800	0.621	0.797	0.800
	LA2	0.803			

	LA3	0.798			
	LA4	0.752			
MA	MA1	0.834	0.624	0.799	0.802
	MA2	0.777			
	MA3	0.795			
	MA4	0.751			
OV	OV1	0.820	0.658	0.827	0.829
	OV2	0.811			
	OV3	0.820			
	OV4	0.795			
RA	RA1	0.772	0.559	0.842	0.843
	RA2	0.792			
	RA3	0.777			
	RA4	0.723			
	RA5	0.709			
	RA6	0.706			
RE	RE1	0.815	0.614	0.842	0.844
	RE2	0.764			
	RE3	0.823			
	RE4	0.768			
	RE5	0.744			

Source: Data Processed (2026)

Regarding the analysis of discriminant validity, two methods were employed: Fornell-Larcker criteria and HTMT ratio. From the perspective of the results obtained from the analysis of Fornell-Larcker criteria shown in Table 5, it can be concluded that for most constructs, the internal correlations of the constructs are under the criterion since their values are less than the square root of AVE. However, a problem related to the discrimination ability of constructs may arise regarding the Financial Literacy and Investment Decision, since their correlation is above the square root of the AVE value. As for the HTMT results demonstrated in Table 6, again, while for most pairs of constructs, the ratio is below the criterion of 0.90, it is above this limit in case of Financial Literacy and Investment Decision, which is 0.978. This implies that there exists a significant amount of conceptual similarity between the two constructs since financial literacy involves knowledge and the ability to make decisions, whereas investment decision involves the practical application of such an ability. It is important to note that even though this limitation exists, it only applies to this particular pair of constructs, and all other constructs show discriminant validity. As such, the two constructs are kept intact to maintain the theoretical integrity of the proposed model. In future, it is recommended that the measure of these constructs be improved through item differentiation, for example, distinguishing the subjective and objective aspects of financial literacy (Fornell & Larcker, 1981; Hair et al., 2017).

Table 5. Fornell-Larcker Criterion

	AN	FL	HB	ID	LA	MA	OV	RA	RE
AN	0.781								
FL	0.608	0.805							
HB	0.635	0.512	0.800						
ID	0.701	0.747	0.588	0.742					
LA	0.658	0.584	0.559	0.683	0.788				

MA	0.647	0.677	0.571	0.697	0.638	0.790			
OV	0.559	0.538	0.503	0.617	0.538	0.557	0.811		
RA	0.655	0.609	0.616	0.728	0.649	0.715	0.570	0.748	
RE	0.603	0.614	0.582	0.651	0.612	0.624	0.560	0.689	0.783

Source: Data Processed (2026)

Table 6. Heterotrait-monotrait ratio (HTMT)

	AN	FL	HB	ID	LA	MA	OV	RA	RE
AN									
FL	0.773								
HB	0.764	0.653							
ID	0.853	0.978	0.726						
LA	0.802	0.760	0.686	0.852					
MA	0.789	0.886	0.706	0.870	0.795				
OV	0.668	0.692	0.606	0.757	0.659	0.681			
RA	0.778	0.773	0.740	0.885	0.788	0.870	0.679		
RE	0.713	0.778	0.701	0.792	0.742	0.758	0.665	0.814	

Source: Data Processed (2026)

According to the model fit shown in Table 7, the proposed structural model has proven itself to be adequately aligned with the empirical data. Specifically, the SRMR value of 0.052 in respect to the saturated model is well below the suggested optimal threshold of 0.08, which speaks to a satisfactory model fit. As for the NFI, the calculated value of 0.812, although not reaching the suggested optimal threshold of 0.90, still appears satisfactory given that the current research can be regarded as exploratory, and thus the criteria for model evaluation are more relaxed (Hair et al., 2017). In this case, the calculated value allows one to consider the structural model as an acceptable one, which can serve as a starting point for interpreting the results.

The explained variance (R Square, R^2) of 0.770 in respect to the investment decision (ID) variable reveals that the overall variance of 77% in investment decisions is explained through overconfidence, herding behavior, anchoring, representativeness, mental accounting, loss aversion, regret aversion, and financial literacy.

Table 7. Model Fit

	Saturated model
SRMR	0.052
NFI	0.812
R-square	
ID	0.770

Source: Data Processed (2026)

The results of the structural model have been presented in Table 8 below, which details the path coefficients and p-values of each relationship. According to the results obtained, it can be stated that the variables Anchoring ($\beta = 0.152$, $p = 0.029$), Loss Aversion ($\beta = 0.146$, $p = 0.001$), Mental Accounting ($\beta = 0.104$, $p = 0.047$), Overconfidence ($\beta = 0.093$, $p = 0.032$), and Regret Aversion ($\beta = 0.165$, $p = 0.001$) indicate a significantly positive correlation with Investment Decision, implying that these variables have a considerable contribution to the process of investment decision making. Contrarily, Herding Behavior ($\beta = -0.015$, $p = 0.686$) displays a negatively correlated but insignificant connection, whereas Representativeness ($\beta = 0.018$, $p = 0.674$) demonstrates a weakly positive but equally insignificant correlation with Investment Decision.

Table 8. Direct Findings

	Coefficients	P values	Result	Hypothesis
AN -> ID	0.152	0.029	Significant	Accepted
HB -> ID	-0.015	0.686	Insignificant	Rejected
LA -> ID	0.146	0.001	Significant	Accepted
MA -> ID	0.104	0.047	Significant	Accepted
OV -> ID	0.093	0.032	Significant	Accepted
RA -> ID	0.165	0.001	Significant	Accepted
RE -> ID	0.018	0.674	Insignificant	Rejected

Source: Data Processed (2026)

Table 9 depicts the end results of the moderation analysis, showing the interaction effects of Financial Literacy on each behavioral factor in relation to Investment Decision. As shown below, there are significant moderating effects of Financial Literacy found on the association between Loss Aversion and Investment Decision ($\beta = 0.128$, $p = 0.032$) and Overconfidence and Investment Decision ($\beta = -0.178$, $p = 0.011$). It can be seen that the positive interaction effect of Financial Literacy on Loss Aversion suggests that people who have more knowledge about finance would feel a more intense loss aversion in their investment decision-making process. On the contrary, it is indicated by the negative interaction effect of Financial Literacy on Overconfidence that people who are financially literate would not be affected easily by overconfidence.

Meanwhile, the interaction effects between Financial Literacy and other behavioral factors, including Regret Aversion ($\beta = -0.051$, $p = 0.581$), Representativeness ($\beta = -0.032$, $p = 0.596$), Anchoring ($\beta = 0.078$, $p = 0.263$), Herding Behavior ($\beta = -0.023$, $p = 0.665$), and Mental Accounting ($\beta = -0.059$, $p = 0.493$), show no meaningful relationship with Investment Decision. These results show that the moderator variable, Financial Literacy, is not significantly related to the other variables with respect to Investment Decision. Thus, it can be seen from the results that the moderation effect of Financial Literacy is selective in nature.

Table 9. Indirect Findings

	Coefficients	P values	Result	Hypothesis
FL x RA -> ID	-0.051	0.581	Insignificant	Rejected
FL x RE -> ID	-0.032	0.596	Insignificant	Rejected
FL x AN -> ID	0.078	0.263	Insignificant	Rejected
FL x LA -> ID	0.128	0.032	Significant	Rejected
FL x HB -> ID	-0.023	0.665	Insignificant	Rejected
FL x MA -> ID	-0.059	0.493	Insignificant	Rejected
FL x OV -> ID	-0.178	0.011	Significant	Accepted

Source: Data Processed (2026)

DISCUSSION

The results obtained in this study reveal some useful information regarding the impact of behavioral bias and financial literacy on investing. Herding behavior (H1) had no significant effect on cryptocurrency investment decisions, indicating that respondents' choices were not determined by other investors' buying, selling, or portfolio choices. This result is consistent with [Budiman et al. \(2025\)](#), who found that herding bias did not significantly affect Indonesian stock-investment decisions and attributed this outcome to access to varied information and independent analysis. [Fadli et al.](#)

(2024) similarly reported that herding did not directly determine cryptocurrency investment experience among Indonesian investors, interpreting this pattern as investor maturity and self-analysis. This evidence supports the proposition that crowd signals need not be decisive in crypto-related choices. Similar findings also found by Gurung et al. (2024), Marheni et al. (2023), and Nurbarani & Soepriyanto (2022). These studies indicate that an insignificant effect does not mean social information is absent; rather, it does not override personal judgment. Herding Theory is qualified: information asymmetry and social pressure may induce imitation, but their influence weakens when investors possess familiarity, analytical confidence, and accumulated experience. Given that most respondents had more than three years of cryptocurrency investing experience, they may be better able to distinguish informative market developments from speculative noise and therefore rely more heavily on personal analysis (Devenow & Welch, 1996).

However, the result contrasts with Abdeldayem & Aldulaimi (2024), Kartini & Nahda (2021), Mahmood et al. (2024), who report a positive herding effect. These differences may reflect sample experience and measures of herding. Herding is more likely where investors are inexperienced, uncertain, reliant on peers, or lack private information. Financial literacy did not alter this relationship either (H8), echoing Fadillah et al. (2025) and Mahmood et al. (2024), implying that experience may already have reduced dependence on crowd signals. Platforms should continue prioritise transparent risk disclosures, credible market data, and analytical tools over “trending” or “most bought” prompts for seasoned users, while protecting newer investors who may remain susceptible to social pressure.

The significant positive effect of overconfidence (H2) indicates that investors with greater confidence in their knowledge and trading judgement are more likely to make cryptocurrency investment decisions. In a highly volatile market, such confidence may accelerate participation because investors interpret uncertain price movements as opportunities they can evaluate or time successfully, even when the underlying information is incomplete (Altaf & Jan, 2023). Kaur et al. (2024) also explain that this bias remains relevant even among investors with market experience. This finding is consistent with prior evidence showing that overconfidence significantly increases investment decisions in cryptocurrency and other financial markets (Ahmad et al., 2025; Mahmood et al., 2024; Nurbarani & Soepriyanto, 2022). The consistency across these studies suggests that overconfidence can encourage investors to act on their own judgements, particularly when market conditions are uncertain and information is incomplete. However, the evidence is not uniform. Abideen et al. (2023) reported model-dependent relationships between behavioural biases and investment decisions, while Adil et al. (2022) found no significant effect of overconfidence among female investors. These differences indicate that the effect of overconfidence may depend on investor characteristics, market context, and the way behavioural biases and investment decisions are measured.

The finding therefore supports behavioural-finance theory by showing that investment decisions are not necessarily based on fully rational evaluation of available information. Instead, perceived competence may increase investors’ willingness to act despite uncertainty. However, a positive effect on investment decisions should not be interpreted as evidence of better decision quality or higher investment performance, as greater confidence may also encourage excessive risk-taking. This distinction is important because the result captures investment behaviour rather than the quality of the resulting decision. The negative moderating effect of financial literacy on the relationship between overconfidence and investment decisions (H9) further indicates that financial knowledge can weaken the tendency of overconfident investors to act on their confidence. This result is consistent with Adil et al. (2022) and Budiman et al. (2025), who found that financial literacy significantly reduced the influence of overconfidence on investment-related outcomes. Related evidence also suggests that financial literacy can shape cryptocurrency investment intention and increase awareness of overconfidence bias (Prasetyo & Kurniasari, 2023; Usriyono & Wahyudi, 2023). Taken together, these findings suggest that financial literacy does not necessarily eliminate overconfidence, rather, it may encourage investors to evaluate their judgements more carefully

before making investment decisions. Accordingly, the results highlight the importance of investor education that goes beyond financial product knowledge. Financial education should also strengthen debiasing practices, such as assessing risk, considering diversification, and comparing expected returns with potential losses, while companies and regulators can provide risk warnings and decision-support tools to reduce excessive certainty and encourage more careful investment decisions. Such measures may help investors maintain confidence while reducing the likelihood that excessive certainty translates into poorly evaluated investment actions.

The insignificant effect of representativeness (H3) indicates that investors' decisions are not primarily driven by past price patterns, company performance, or other familiar information. This finding is consistent with previous studies that reported no significant relationship between representativeness and investment decisions (Baker et al., 2019; Gulzar et al., 2024; Mahmood et al., 2024; Rozak et al., 2025; Sudirman et al., 2023; Tahir & Danarsari, 2023). Further studies suggested that higher educational levels may reduce reliance on representativeness by encouraging investors to evaluate information more comprehensively (Baker et al., 2019; Tahir & Danarsari, 2023). The result may also reflect the characteristics of the present sample, which largely consists of experienced investors who may be less reliant on historical patterns when evaluating cryptocurrency assets.

However, this finding contrasts with Hafez (2021) and Kartini & Nahda (2021), who found that stock investors relied on past performance, familiar companies, and market-related news when making investment decisions. Gurung et al. (2024) also reported a positive but insignificant relationship, suggesting that representativeness may still have a limited role in investment behaviour. These differences indicate that the influence of representativeness may vary according to investor characteristics, market conditions, and the available information. In the Indonesian cryptocurrency market, which is still relatively new, rapid changes in prices, technology, and market conditions may further reduce the relevance of historical patterns for predicting future outcomes.

The insignificant moderating effect of financial literacy on representativeness (H10) is consistent with Mahmood et al. (2024) and Sadeeq (2025). This finding indicates that financial literacy does not significantly alter the influence of representativeness on cryptocurrency investment decisions. Financially literate investors may still rely on familiar patterns or recent performance when information is uncertain, suggesting that financial knowledge alone may not eliminate heuristic-based decision-making. Therefore, financial education should also address behavioural biases, while cryptocurrency platforms and financial institutions can provide risk disclosures, historical-performance warnings, and decision-support tools that encourage investors to consider broader and more current information rather than relying solely on past patterns.

Hypothesis 4 finds anchoring to have a significant positive effect on crypto investment decisions, indicating that investors anchor judgments to prior reference points, past prices, historical highs, rather than fully incorporating new market information. Ahmad et al. (2025) explain that investors often build price forecasts from a single reference point (a past price, trading volume, or recent headline), leaving their assessments poorly adjusted to current conditions. This result aligns with prior evidence that anchoring meaningfully shapes investment behavior across contexts, including Nepalese investors (Gurung et al., 2024) and Pakistani investors, where financial literacy failed to weaken the effect (Mahmood et al., 2024). Srivastava et al. (2025) go further, identifying anchoring as the single most influential bias among those tested in their sample of working women investors, highlighting its stronger influence compared with other well-known biases.

Contrary to this finding, Marciano et al. (2025) found that anchoring did not significantly influence investment decisions among investors in Indonesia, Japan, and Thailand. This difference may be related to the heterogeneous characteristics of their sample, as the study combined investors from three countries with different economic, cultural, and market structures. The authors also acknowledged that the relatively small sample of 232 respondents across these countries may limit the generalizability of the findings.

Nevertheless, the moderating effect of financial literacy on the relationship between anchoring and investment decisions (H11) was insignificant. This finding is consistent with [Mahmood et al. \(2024\)](#), who reported that financial literacy did not significantly moderate the relationships between behavioral biases and investment decisions. [Sadeeq \(2025\)](#) similarly found that financial literacy did not significantly moderate the relationship between heuristic-driven biases and investment decision-making, suggesting that basic financial knowledge or investment experience may not be sufficient to mitigate behavioral biases when investors lack more specialized investment-related knowledge. Therefore, even financially literate investors may remain susceptible to anchoring when making investment decisions, particularly when market uncertainty and complexity encourage reliance on readily available reference points. Practically, this implies financial-literacy programs alone cannot curb anchoring. Investors should be prompted to interrogate reference prices directly asking whether a discount from a prior all-time high reflects genuine undervaluation or mere proximity bias. Platforms could support this by pairing historical prices with real-time volatility and volume data, while educators embed behavioral-bias literacy alongside conventional risk and diversification training.

Mental accounting (H5) has a positive and significant effect on cryptocurrency investment decisions; therefore, H5 is accepted. This finding indicates that investors tend to separate their financial resources into different mental categories and make investment decisions according to the purpose assigned to each category. The result is consistent with [Adiputra et al. \(2024\)](#) and [Bai \(2023\)](#), who found that investors use mental accounts to evaluate costs, benefits, and the allocation of their available funds. [Ginting et al. \(2023\)](#) further show that mental accounting is relevant among Indonesian cryptocurrency investors because investors use mental categorization to manage their portfolios and financial resources. This finding also supports [Zhang & Sussman \(2018\)](#) theory which explain that individuals categorize financial resources according to their perceived purpose and evaluate these categories differently. In the context of cryptocurrency, this mechanism may lead investors to treat crypto funds as a separate speculative account, allowing them to accept greater risk without perceiving the investment as equivalent to using their essential savings. More recent international evidence also indicates that mental accounting remains applicable in cryptocurrency settings, suggesting that the digital nature of crypto assets does not eliminate individuals' tendency to assign different meanings and purposes to their money ([de Almeida et al., 2026](#)).

This tendency is particularly relevant to cryptocurrency because investors may mentally separate funds intended for speculative investments from funds reserved for regular financial needs. Such categorization can make investors more willing to allocate a specific portion of their resources to cryptocurrency because the perceived risk is confined to a particular mental account. However, the effect is not universal. [Winata et al. \(2025\)](#) found that mental accounting did not significantly influence cryptocurrency investment decisions among Generation Z investors, indicating that categorizing funds does not always translate into actual investment behavior. This contrast suggests that mental accounting becomes influential when investors actively use these categories as a basis for determining how much money they are willing to expose to cryptocurrency risk.

In contrast, the moderating effect of financial literacy on the relationship between mental accounting and cryptocurrency investment decisions (H12) is insignificant; therefore, H12 is rejected. This finding suggests that financial literacy may improve investors' ability to understand financial information and investment risks, but it does not necessarily change the psychological tendency to categorize and evaluate financial resources through mental accounts. This result is consistent with [Suriadi et al. \(2023\)](#) and [Wibowo & Widianingsih \(2025\)](#), who found that financial literacy has a limited or insignificant association with mental accounting in investment decisions. [Suriadi et al. \(2023\)](#) further explain that mental accounting is strongly related to psychological factors and behavioral biases, which may reduce the influence of financial knowledge on how investors categorize their financial resources. This is particularly relevant to cryptocurrency investment, where investors may recognize the risks associated with cryptocurrency but continue to rely on psychological processes

when allocating funds. Therefore, financial literacy may support investors in evaluating financial activities, but it does not necessarily weaken the influence of mental accounting on cryptocurrency investment decisions. The finding also indicates that improving financial literacy alone may be insufficient to reduce behavioral influences in cryptocurrency investment, suggesting that financial education should be complemented with strategies that strengthen investors' awareness of psychological biases and encourage more systematic evaluation of investment decisions.

The findings imply that cryptocurrency platforms and financial educators should not rely solely on increasing financial knowledge. Investors should also be encouraged to establish clear investment budgets, distinguish speculative funds from essential savings, and regularly reassess whether their mental allocation remains consistent with their actual risk capacity. Regulators and investment platforms can support this process through risk disclosures, educational tools, and portfolio-monitoring features that encourage investors to evaluate their overall financial position rather than viewing cryptocurrency funds in isolation.

Loss aversion (H6) has a significant positive influence on cryptocurrency investment decisions. This finding indicates that investors tend to place greater weight on potential losses than on equivalent gains when making investment decisions. This tendency is particularly relevant in the cryptocurrency market, where high price volatility and uncertainty can make it difficult for investors to assess the value and future performance of digital assets. This proves theory that negative price movements may receive greater psychological attention and encourage investors to make decisions aimed at avoiding or limiting losses (Skwarek, 2025). Therefore, the significant effect of loss aversion suggests that cryptocurrency investment decisions are not determined solely by objective evaluations of potential returns but are also shaped by investors' psychological responses to the possibility of losing money.

The finding is consistent with previous studies showing that loss aversion influences investors' decisions (Ahmad et al., 2025; Bihari et al., 2025; Handoko et al., 2024; Hossain & Siddiqua, 2024; Kaur et al., 2024; Yasmin & Ferdaous, 2023). In particular, Kaur et al. (2024) found that individual cryptocurrency investors may continue holding declining assets because realizing the loss is psychologically difficult. This behaviour reflects the tendency to avoid realizing losses even when selling the asset may be a more rational choice based on its prospects. In a highly volatile cryptocurrency environment, where prices can change substantially within a short period, such psychological reactions may become more influential because investors are frequently exposed to gains and losses.

The moderating effect of financial literacy on the relationship between loss aversion and cryptocurrency investment decisions is significant, but in the opposite direction to what was hypothesized. Instead of weakening the influence of loss aversion, financial literacy strengthens it. H13 is therefore rejected, not for lack of significance, but because the direction of the effect contradicts the original hypothesis. Interestingly, this result indicates that higher financial literacy does not make investors more resistant to loss-averse behavior when investing in cryptocurrency, it amplifies it. These findings align with (Sang, 2026; Vrdoljak et al., 2026) theory, which explains that higher digital financial literacy can be associated with greater confidence, faster market responsiveness, and more active cryptocurrency investment decisions, indicating that financial literacy does not necessarily reduce affect-driven investment behavior. For investors, understanding loss aversion can help them recognize the tendency to hold losing assets or make decisions based on fear of losses. Investors should combine financial knowledge with clear risk limits and investment plans. For financial educators and advisors, financial education should also address behavioral biases, not only financial knowledge. Meanwhile, cryptocurrency platforms and regulators can provide clearer risk information and educational resources to support better investment decisions. Overall, the findings show that financial literacy alone may not reduce loss-averse behavior, making awareness of psychological biases equally important.

Regret aversion (H7) exerts the strongest positive influence on cryptocurrency investment decisions among the biases examined, indicating that investors weigh the anticipated pain of a wrong decision more heavily than the pursuit of returns. This surfaces as two errors: holding losing assets to avoid confirming a bad call and selling winners too early to pre-empt a future decline. [Bihari et al. \(2025\)](#), using regression and neural-network analysis of 337 retail investors, identify regret aversion as the single strongest predictor of investment choice driven largely by investors' fear of making mistakes. This is corroborated across markets by [Gurung et al. \(2024\)](#), [Hafez \(2021\)](#), [Yasmin & Ferdaous \(2023\)](#), who each report regret aversion as a significant driver of investment decisions among Nepalese, Egyptian, and other individual investors. Cryptocurrency's volatility likely amplifies this tendency. Frequent, visible price swings continually force investors to reassess whether a decision was "right," sharpening the emotional stakes of every buy, hold, or sell decision.

[Wangzhou et al. \(2021\)](#) offer a partial counterpoint, finding that financial literacy weakens regret aversion's effect among real estate investors, which is a market defined by stability and long holding periods, unlike crypto's rapid repricing, which likely limits how far literacy alone can offset regret-driven behavior here. This finding is consistent with H14, financial literacy does not significantly moderate regret aversion's effect on crypto investment decisions. [Hariono et al. \(2023\)](#) attribute this to the persistence of fear and regret even among financially knowledgeable investors. [Negara & Rahyuda \(2025\)](#) also find that financial literacy significantly moderates cognitive biases but fails to moderate emotional biases such as regret aversion, because biases originate from impulse rather than an information deficit. [Adil et al. \(2022\)](#) similarly report financial literacy's moderating effect on emotional biases as statistically insignificant, in contrast to its stronger role for knowledge-dependent biases. Together, these findings support classifying regret aversion as an emotional rather than cognitive bias, not in what investors know, which is precisely why financial-knowledge interventions struggle to weaken it. Addressing regret aversion in crypto markets may therefore require behavioral coaching or structured decision protocols rather than financial-literacy education alone.

CONCLUSION

This study concludes that cryptocurrency investment decisions among Indonesian investors are shaped by a combination of behavioral biases and financial literacy. Overconfidence, anchoring, mental accounting, loss aversion, and regret aversion tend to encourage investment decisions, while herding and representativeness do not appear to be dominant drivers in the studied context. Financial literacy plays a selective rather than universal moderating role, indicating that financial knowledge does not automatically reduce the influence of behavioral biases and may interact differently with cognitive and emotional tendencies. These findings generally support behavioral finance theory by demonstrating that cryptocurrency investment decisions cannot be understood solely through rational financial evaluation, as psychological factors remain relevant in a highly uncertain and volatile market. Therefore, improving investment outcomes requires not only financial knowledge but also greater awareness and management of behavioral biases. Investors, educators, platforms, and regulators should consider combining financial education with behavioral-bias awareness, risk management, and structured decision-making approaches to support more disciplined cryptocurrency investment decisions.

RECOMMENDATION

The recommendation are divided into two:

1. Practical advice: For investors, the findings suggest that improving financial knowledge should be accompanied by awareness of behavioral biases, particularly overconfidence, anchoring, mental accounting, loss aversion, and regret aversion. Investors are encouraged to use clear investment plans, risk limits, and structured decision-making rather than relying solely on emotions or market signals. Cryptocurrency platforms and financial educators can support this

by providing clearer risk information, behavioral-bias education, and decision-support features that encourage more careful investment evaluation.

2. Theoretical Suggestions: Future research should address several limitations of this study. First, the use of convenience sampling, the concentration of experienced cryptocurrency investors, and the limited focus on seven behavioral biases may restrict the generalizability of the findings; future studies could include more diverse investors, particularly novice investors, and examine additional psychological and social factors. Second, the cross-sectional and self-reported data provide only a snapshot of investor behavior and may not capture changes across different cryptocurrency market conditions. Longitudinal research could therefore provide a better understanding of how behavioral biases influence investment decisions over time. Finally, the measurement of financial literacy should be further refined, particularly the FL3 item and the distinction between financial literacy and investment decision, as the high HTMT value indicates potential overlap between the two constructs. Future studies should develop clearer measurement items and distinguish objective and subjective financial literacy to strengthen construct validity.

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