

The Effect of Financial Literacy on Cryptocurrency Investment Intention: The Mediating Role of Perceived Risk

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ABSTRACT

This study examines the effect of financial literacy on cryptocurrency investment intention and tests whether perceived risk mediates the relationship. A quantitative cross-sectional survey was conducted among 40 active cryptocurrency investors in Indonesia. The model was estimated using variance-based Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.29. The measurement model satisfied reliability, convergent validity, and discriminant validity requirements. The structural model shows that financial literacy has a positive and significant effect on investment intention ($\beta = 0.700$; $p < 0.001$) and, unexpectedly, also has a positive and significant effect on perceived risk ($\beta = 0.703$; $p < 0.001$). Perceived risk does not significantly affect investment intention ($\beta = 0.003$; $p = 0.495$), and the indirect effect of financial literacy through perceived risk is insignificant ($\beta = 0.002$; $p = 0.495$). These findings indicate that financially literate crypto investors may recognize more risks without becoming less willing to invest. Accordingly, financial literacy may operate primarily as a decision-enabling and risk-recognition capability rather than through a risk-reduction mechanism. The study contributes to the literature by distinguishing risk awareness from risk avoidance among active cryptocurrency investors and highlights the need for investor education that emphasizes risk-management competence.

Keywords : financial literacy, perceived risk, investment intention, cryptocurrency, PLS-SEM.

INTRODUCTION

Digital financial innovation has broadened retail investors' access to non-traditional assets, with cryptocurrency becoming one of the most visible examples. Unlike conventional securities, cryptocurrencies combine investment characteristics with blockchain technology, decentralized transactions, pronounced price volatility, cybersecurity exposure, and regulatory uncertainty. These features make crypto investing a particularly relevant setting for behavioral finance because investors must evaluate expected returns while processing unfamiliar and rapidly changing risks. Consequently, investment intention cannot be explained solely by return expectations; investors' financial capability and subjective risk assessment are also likely to matter.

Financial literacy provides a cognitive foundation for evaluating financial products and making informed decisions. It encompasses knowledge of concepts such as risk and return, diversification, compounding, transaction costs, and the consequences of financial choices (HUSTON, 2010; Lusardi & Mitchell, 2014). Both objective and perceived financial literacy have also been linked to financial behavior,

indicating that knowledge and confidence can jointly shape financial choices (Allgood & Walstad, 2016). Prior studies show that financial literacy is associated with participation in financial markets and the use of relatively complex investment products (Grohmann et al., 2018; van Rooij et al., 2011). In the crypto context, Fujiki (2021) reports that crypto-asset ownership is related to financial literacy and investment experience, while Hayashi and Routh (2025) find that cryptocurrency investors tend to display higher financial literacy and financial risk tolerance than non-owners. Jones et al. (2024) further show that general financial literacy and crypto literacy are positively related, suggesting that conventional financial knowledge helps investors understand digital assets.

However, the effect of financial literacy on cryptocurrency behavior is not necessarily linear or purely protective. Better-informed investors may be more capable of identifying price volatility, fraud, liquidity constraints, cybersecurity threats, platform failure, and regulatory uncertainty. Thus, greater literacy may increase the quality of risk recognition rather than simply lower perceived risk. Cascavilla (2024), for example, demonstrates that financial literacy influences how individuals interpret Bitcoin as money or as a speculative asset. This possibility is important because perceived risk refers to an investor's subjective assessment of uncertainty and potential losses, whereas risk tolerance concerns the amount of risk an investor is willing to accept. The two constructs should therefore not be treated as equivalent.

Perceived risk has frequently been incorporated into models of cryptocurrency adoption and holding intention. Huang (2019) shows that perceived risk and perceived value contribute to Bitcoin holding intention. Previous investment research also shows that financial literacy and risk perception jointly influence investment choice, while risk aversion and emotion can alter risky investment intention (Aren & Nayman Hamamci, 2020; Aren & Zengin, 2016). Yet the broader evidence is mixed. Bommer et al. (2023), through a meta-analysis, conclude that cryptocurrency intention is shaped by a combination of technological, economic, social, and psychological factors, which implies that perceived risk may not operate as a universal barrier. This issue may be particularly relevant among active investors. Individuals who already participate in crypto markets have crossed the initial adoption threshold and may regard volatility as an inherent feature of an asset class characterized by high-risk-high-return expectations.

The Indonesian setting is also relevant because participation in digital investment has grown rapidly, while investor characteristics remain diverse. Evidence on Bitcoin literacy also suggests that demographic differences can shape knowledge of cryptocurrency markets (Bannier et al., 2019). Abdullah et al. (2019) show that financial literacy and psychological factors are important in explaining intention toward risky digital investment in Indonesia. Nevertheless, relatively limited evidence explains whether perceived risk acts as the mechanism through which financial literacy affects cryptocurrency investment intention among

investors who already have actual market experience. Most studies emphasize ownership, adoption, general risk tolerance, or direct effects, leaving the mediating role of perceived risk less clearly established.

This study addresses that gap by examining financial literacy, perceived risk, and cryptocurrency investment intention in a single mediation model among active crypto investors. Recent evidence from university students also confirms that financial literacy can have complex, even opposing, relationships with cryptocurrency investment intention depending on intervening perceptions and attitudes (Phung et al., 2026). The study offers two main contributions. First, it focuses on investors with actual cryptocurrency experience rather than purely hypothetical adopters. Second, it tests whether financial literacy works through a risk-reduction mechanism or operates more directly as a decision-enabling capability. Based on the literature, four hypotheses are proposed: H1, financial literacy negatively affects perceived risk; H2, perceived risk negatively affects cryptocurrency investment intention; H3, financial literacy positively affects cryptocurrency investment intention; and H4, perceived risk mediates the effect of financial literacy on cryptocurrency investment intention.

RESEARCH METHODS

This study employed a quantitative explanatory design with a cross-sectional survey. The population consisted of cryptocurrency investors in Indonesia, while the final sample comprised 40 respondents who were active investors at least until June 2026. Respondents were selected using criterion-based non-probability sampling because actual investment experience was required to ensure that evaluations of risk and investment intention were grounded in market exposure. The sample consisted of 28 men (70.0%) and 12 women (30.0%); 21 respondents (52.5%) were Generation Z and 19 (47.5%) were Millennials.

Primary data were collected through a structured questionnaire using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Investment intention was treated as a proximal behavioral intention consistent with the logic of the Theory of Planned Behavior, in which intention represents an immediate antecedent of behavior (Ajzen, 1991). Financial literacy was operationalized as respondents' understanding of basic financial and investment concepts relevant to risk-return assessment, diversification, calculations, transaction costs, and risk management. Perceived risk captured respondents' subjective assessment of uncertainty and possible negative outcomes from cryptocurrency investment. Investment intention reflected respondents' willingness to continue, maintain, or increase cryptocurrency investment. The final measurement model contained three indicators for financial literacy, four for perceived risk, and five for investment intention.

The hypotheses were tested using variance-based PLS-SEM with SmartPLS 3.29. PLS-SEM was selected because the study emphasizes explained variance,

prediction, and estimation of direct and indirect relationships in a parsimonious model (J. Hair & Alamer, 2022; J. F. Hair et al., 2019). Model evaluation followed two stages. The measurement model was assessed using outer loadings, Average Variance Extracted (AVE), Cronbach's alpha, Composite Reliability, and the Heterotrait-Monotrait ratio (HTMT). The structural model was assessed using Variance Inflation Factor (VIF), R^2 , Q^2 , f^2 , bootstrapped path coefficients, and the specific indirect effect. Statistical significance was determined at $p < 0.05$. Indicators with loadings between 0.40 and 0.70 were retained when construct reliability and AVE remained satisfactory, consistent with PLS-SEM guidance.

RESULT AND DISCUSSION

Respondent Profile and Measurement Model

Bitcoin was the preferred cryptocurrency for 26 respondents (65.0%), followed by altcoins for nine respondents (22.5%) and Ethereum for five respondents (12.5%). Generation Z respondents were more concentrated in the less-than-one-year experience category, whereas Millennials were more represented among investors with more than three years of experience. This distribution suggests that the sample combined relatively new market participants with more experienced investors.

Table 1 Reliability and convergent validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
Financial Literacy	0.885	0.928	0.812
Investment Intention	0.799	0.854	0.548
Perceived Risk	0.757	0.844	0.577

All constructs met acceptable reliability and convergent validity requirements. Cronbach's alpha values ranged from 0.757 to 0.885, Composite Reliability ranged from 0.844 to 0.928, and all AVE values exceeded 0.50. Most indicator loadings exceeded 0.70. INV_01 (0.561) and PER_02 (0.633) were retained because the corresponding constructs still satisfied AVE and reliability criteria. Discriminant validity was also supported, with HTMT values of 0.755 for financial literacy-investment intention, 0.645 for financial literacy-perceived risk, and 0.630 for investment intention-perceived risk; all were below 0.90 (Henseler et al., 2016). VIF values were below 3.00, indicating no critical collinearity issue.

Structural Model and Hypothesis Testing

The result will be conduct based on hypothesis-testing results below:

Table 2 Hypothesis-testing results

Hypotesis	Path	β	t	p	Decision
H1	Financial Literacy → Perceived	0.703	12.182	<0.001	Rejected

H2	Risk Perceived Risk → Investment Intention	0.003	0.012	0.495	Rejected
H3	Financial Literacy → Investment Intention	0.700	4.449	<0.001	Support ed
H4	FL → Perceived Risk → Investment Intention	0.002	0.011	0.495	Rejected

The endogenous constructs showed moderate explanatory power. Financial literacy explained 48.1% of the variance in perceived risk ($R^2 = 0.481$), while financial literacy and perceived risk jointly explained 46.4% of the variance in investment intention ($R^2 = 0.464$). Predictive relevance was positive for both perceived risk ($Q^2 = 0.267$) and investment intention ($Q^2 = 0.205$). The effect size of financial literacy was large for perceived risk ($f^2 = 0.978$) and investment intention ($f^2 = 0.477$), whereas perceived risk contributed virtually no incremental explanatory power to investment intention ($f^2 = 0.000$).

Financial Literacy and Perceived Risk

The first hypothesis predicted that financial literacy would reduce perceived risk. The result shows the opposite: financial literacy has a positive and significant effect on perceived risk ($\beta = 0.703$; $p < 0.001$). H1 is therefore rejected. Rather than interpreting this finding as evidence that financial literacy makes investors more vulnerable, the result is better understood as a risk-recognition effect. Investors who understand diversification, risk-return trade-offs, transaction costs, and portfolio management may be more capable of identifying the multiple sources of uncertainty embedded in cryptocurrency.

This interpretation is compatible with research showing that cryptocurrency ownership is associated with financial literacy and investment experience (Fujiki, 2021) and that crypto investors can simultaneously possess higher financial literacy and greater risk tolerance (Hayashi & Routh, 2025). Jones et al. (2024) also demonstrate that financial literacy and crypto literacy are interdependent, while Cascavilla (2024) shows that financial literacy shapes how Bitcoin is conceptualized as a monetary or speculative asset. Taken together, these studies support an important distinction: better knowledge does not necessarily make an asset appear safer; it can make the investor's assessment of its risks more informed.

For investor education, this result implies that increased perceived risk should not automatically be viewed as an undesirable outcome of literacy programs. In a high-volatility market, recognizing risks accurately may represent a more mature financial judgment than underestimating them.

Perceived Risk and Investment Intention

Perceived risk does not significantly affect cryptocurrency investment intention ($\beta = 0.003$; $p = 0.495$), so H2 is rejected. Although cryptocurrency is widely regarded as a high-risk asset, the respondents in this study were already active investors. This distinction is important because individuals who remain in the market may have accepted volatility and uncertainty as normal features of cryptocurrency rather than as reasons to avoid investing.

The finding differs from the straightforward risk-deterrence assumption but is consistent with the broader literature showing that cryptocurrency intention is multidimensional. Huang (2019) establishes the relevance of perceived risk to Bitcoin holding intention, yet Bommer et al. (2023) demonstrate that crypto intention is simultaneously shaped by technological, economic, social, and psychological determinants. Among active investors, expected return, risk tolerance, trust, social influence, prior experience, and speculative motives may outweigh risk perception itself.

The result also highlights the conceptual difference between perceived risk and risk tolerance. Perceived risk reflects how risky investors believe an asset to be; risk tolerance reflects how much of that risk they are willing to bear. An investor can therefore acknowledge that cryptocurrency is highly risky while still intending to invest if the potential return is considered attractive or the investor feels capable of managing the exposure.

Financial Literacy and Investment Intention

Financial literacy has a positive and significant effect on cryptocurrency investment intention ($\beta = 0.700$; $p < 0.001$), supporting H3. The large effect size ($f^2 = 0.477$) indicates that financial literacy is not merely statistically significant but substantively important in this model. Investors with stronger financial knowledge may feel better equipped to compare risk and expected return, assess transaction costs, diversify, calculate potential losses, and recognize inappropriate investment propositions.

This finding is consistent with the broader financial-participation literature. van Rooij et al. (2011) show that financially literate individuals are more likely to participate in stock markets, while Fujiki (2021) links crypto-asset ownership to financial literacy and investment experience. Hayashi and Routh (2025) similarly report higher literacy among individuals using cryptocurrency primarily for investment. In Indonesia, Abdillah et al. (2019) also identify financial literacy as relevant to risky digital investment intention.

Accordingly, financial literacy may function as a participation-enabling capability. It provides investors with the cognitive resources required to understand a complex asset class and increases their confidence to act. However, a stronger intention to invest should not be equated with better investment performance. Outcomes may still depend on behavioral biases, timing, security practices, portfolio construction, and market conditions.

Mediating Role of Perceived Risk

The indirect effect of financial literacy on investment intention through perceived risk is insignificant ($\beta = 0.002$; $p = 0.495$), so H4 is rejected. The mediation fails because the second stage of the proposed mechanism is absent: financial literacy strongly predicts perceived risk, but perceived risk does not predict investment intention.

This result suggests that financial literacy affects investment intention mainly through a direct capability pathway rather than through a risk-reduction pathway. In practical terms, financially literate investors may recognize more risks and still remain willing to invest. The evidence therefore challenges the assumption that literacy encourages participation because it makes cryptocurrency appear less risky.

The non-significant mediation also opens a clearer future research agenda. Risk tolerance, financial self-efficacy, perceived behavioral control, trust, expected return, overconfidence, and fear of missing out may be more plausible mediators or moderators. Testing these mechanisms could clarify why risk awareness does not translate into lower intention among active investors.

Implications

Theoretically, the study distinguishes risk recognition from risk avoidance. Financial literacy can increase awareness of cryptocurrency risk without reducing investment intention, indicating that perceived risk and risk tolerance should be modeled separately. Practically, investor education should move beyond generic warnings that cryptocurrency is risky. Programs should emphasize portfolio allocation, position sizing, diversification, security hygiene, scam detection, risk-return assessment, and the consequences of leverage. Exchanges and regulators can support this objective through transparent risk disclosure, educational modules, security guidance, and tools that help retail investors evaluate portfolio exposure.

CONCLUSION

This study successfully concluded that *panic buying* behavior in times of uncertainty is not a standalone consumption activity, but rather a complex manifestation of the interaction between environmental risk perception, individual psychological anxiety, and social group pressure. The results of the structural analysis empirically demonstrate that environmental uncertainty has a significant

direct contribution in triggering unstable market behavior. However, the destructive power of this macro uncertainty becomes far more exponential when it successfully exploits people's emotional vulnerabilities. Through model testing, it was found that external uncertainty acts as the primary fuel that amplifies consumers' inner anxiety about future resource scarcity (Leach, 2022). Therefore, *panic buying* should be viewed as a maladaptive coping mechanism, in which excessive material possessions are used as an instinctive tool to restore a sense of control lost due to the crisis situation (Billore & Anisimova, 2021).

Furthermore, the main theoretical contribution of this study lies in successfully demonstrating the crucial role of *Fear of Missing Out* (FOMO) and social influence as dual mediating variables. The relationship between environmental uncertainty and the decision to hoard goods does not occur immediately in a linear manner, but rather is incubated and accelerated through both psychosocial pathways. FOMO has been shown to be a powerful internal psychological driver, where the competitive fear of being left behind compels consumers to make impulsive emergency purchases (Przybylski et al., 2013). At the same time, social influence acts as an external reinforcer through the social contagion effect, where individuals tend to imitate the hoarding actions of their peers to gain validation and a sense of normative security (Cialdini & Goldstein, 2004). This convergence between personal emotional anxiety (FOMO) and digital environmental pressure (social influence) is the primary driving force behind the mass panic phenomenon in the modern retail sector (Omar et al., 2021).

As a practical recommendation, these findings urge public policymakers and retail industry players to shift their crisis management paradigm from a focus on conventional logistics to a more humanistic psychosocial management approach. Given that *panic buying* is heavily mediated by FOMO and distorted social influence through digital media, primary interventions should focus on disrupting the information panic supply chain (Ahmed et al., 2021). Governments and retailers must design transparent, reassuring, and *real-time* data-driven crisis communication strategies to quell rumors of shortages before they escalate into nationwide panic (Yuen et al., 2020). Through healthy public narrative management and enhanced digital literacy, the public is expected to build stronger behavioral resilience, enabling them to remain rational and calm in the face of future disruptions and global uncertainties (Taylor, 2020).

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