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THE MODERATING ROLE OF FINANCIAL LITERACY IN THE RELATIONSHIP BETWEEN MARKET SENTIMENT, SOCIAL MEDIA, AND GENERATION Z'S CRYPTOCURRENCY INVESTMENT DECISIONS

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Abstract

The rapid expansion of cryptocurrency has captivated Generation Z, yet its high volatility means investment decisions are strongly influenced by market sentiment indicators like the Fear and Greed Index (FGI) and social media information. Limited financial literacy can intensify behavioral biases. This study examines the effects of FGI and social media on Generation Z's cryptocurrency investment decisions, with financial literacy as a moderating variable. Using a quantitative approach, data were collected from 152 active cryptocurrency investors in the past six months via a Likert-scale questionnaire. Analysis was conducted using Partial Least Squares-Structural Equation Modeling (PLS-SEM) with SmartPLS 4 (v.4.1.1.4). Results show that both FGI and social media have significant positive effects on investment decisions. Financial literacy has a direct positive effect and significantly moderates the influence of both FGI and social media, attenuating the impact of sentiment and online information by fostering more rational decision-making. These findings highlight the importance of improving financial literacy to reduce emotional bias and enhance the quality of Generation Z's investment decisions in the cryptocurrency market.

Keywords: Fear and Greed Index, Social Media, Financial Literacy, Investment Decisions, Cryptocurrency

INTRODUCTION

Cryptocurrency has evolved from a niche technology into a mainstream investment alternative supported by blockchain's transparency and decentralization, which reduces reliance on intermediaries and fosters user trust in high-volatility markets (Hair Jr et al., 2021; Chakravarty & Sarkar, 2020). Growing adoption among digital natives further accelerates this shift, with Generation Z increasingly viewing crypto as part of their financial and lifestyle choices (Danurwenda & Suhartini, 2024; Palupi & Putranti, 2024)

Yet crypto prices remain highly volatile and sentiment-driven. Market-wide emotion is often summarized by the Fear and Greed Index (FGI), which investors use to time entries and exits—extreme "fear" often signals undervaluation, while "greed" may precede overheating (Gaies et al., 2023; Huang, 2024). At the same time, social media (e.g., X/Twitter, TikTok, Reddit) amplifies narratives at speed, enabling rapid herding and momentum bursts that can decouple prices from fundamentals (Kamil & Tanno, 2022). These dynamics are especially salient for Gen Z investors who rely heavily on online information flows (Danurwenda & Suhartini, 2024).

From a theoretical lens, behavioral finance, popularized by Kahneman & Tversky, explains why investors deviate from rational benchmarks under risk. Prospect Theory, as part of this framework, shows that loss aversion, framing, and reference dependence shape choices in volatile settings, while classic investment texts document the roles of biases such as overconfidence and herding in asset markets (Bodie et al., 2023). In crypto, where information is noisy and fast-moving, these biases interact with sentiment indicators (FGI) and social media cues to influence trading behavior (Nurbarani & Soepriyanto, 2022).

A growing body of evidence suggests financial literacy can buffer these effects. Higher literacy is associated with more disciplined information processing and better portfolio choices (Baihaqqi & Prajawati, 2023) Recent studies also show that literacy moderates the link between behavioral biases and investment decisions, as well as the influence of social media and risk tolerance, reducing impulsivity and improving decision quality (Amalia & Krisnawati, 2024). However, despite improvements, Indonesia's literacy levels remain relatively modest, leaving many new investors vulnerable to emotionally driven trades (Baihaqqi & Prajawati, 2023).

Research Problem and Objective. Building on these gaps, this study focuses on active Gen Z crypto investors in Indonesia to (1) assess the direct effects of market sentiment (FGI) and social media on investment decisions, and (2) test whether financial literacy moderates these relationships—strengthening rational decision-making and filtering biased signals. The study advances the literature by integrating sentiment (FGI), social media, and literacy within a single behavioral-finance framework for digital assets in an emerging market context (Huda et al., 2023; Palupi & Putranti, 2024)

Given the predictive orientation and the potential for non-normal, perception-based survey data, the study employs Partial Least Squares–Structural Equation Modeling (PLS-SEM) using SmartPLS 4. PLS-SEM accommodates complex models with moderators, reflective/ formative indicators, and smaller samples, and emphasizes out-of-sample prediction (Hair et al., 2021). The reliability–validity criteria and moderating-effect estimation follow established PLS-SEM guidance to ensure robust measurement and structural inferences (Hair Jr et al., 2021).

Collectively, this work contributes by clarifying how FGI and social media shape Gen Z crypto decisions and by demonstrating the buffering role of financial literacy, yielding implications for investor education, platform governance, and policy aimed at improving decision quality in Indonesia's rapidly developing crypto ecosystem (Kamil & Tanno, 2022).

REVIEW OF LITERATURE

Behavioral Finance and Prospect Theory

Investment decisions in volatile markets like cryptocurrency often deviate from rational benchmarks, a phenomenon best explained by Behavioral Finance Theory. This theory posits that psychological, emotional, and cognitive factors significantly influence investor behavior, leading to decisions that are not always optimal (Agustini et al., 2022). Unlike traditional finance, which assumes rational actors, behavioral finance acknowledges that investors are susceptible to market sentiment, social pressures, and subjective biases, particularly in high-risk environments.

A cornerstone of behavioral finance is Prospect Theory, developed by Kahneman and Tversky. It argues that individuals make decisions under uncertainty based on perceived gains and losses relative to a reference point, rather than absolute outcomes. A key tenet is **loss aversion**, where the psychological pain of a loss is felt more intensely than the pleasure of an equivalent gain. This bias can lead to irrational behaviors such as panic selling during market downturns—a direct response to the fear of further losses. Other relevant biases include herding behavior, where investors follow the actions of a larger group due to fear of missing out (FOMO), and overconfidence, where investors overestimate their analytical abilities, often fueled by market euphoria (greed). This theoretical lens is crucial for understanding how Gen Z investors navigate the cryptocurrency market.

Market Sentiment: Fear and Greed Index (FGI)

The cryptocurrency market is notoriously driven by collective emotion. The Fear and Greed Index (FGI) serves as a quantitative proxy for this market sentiment, measuring the dominance of fear and greed among investors. An extreme "fear" reading often suggests that the market is oversold and potentially undervalued, presenting a contrarian buying opportunity. Conversely, an extreme "greed" reading indicates market euphoria, suggesting that assets may be overvalued and a correction is possible (Gaies et al., 2023). For Gen Z investors, who are constantly exposed to market volatility, the FGI can act as a powerful psychological trigger. A state of market fear can amplify loss aversion, leading to reactive selling, while market greed can fuel herding behavior and FOMO-driven purchases, highlighting its potential impact on investor actions.

Social Media in Shaping Decisions

For Generation Z, or "digital natives," social media platforms like X (Twitter), TikTok, and Reddit are primary sources of information and social validation (Fadillah et al., 2022). In the context of crypto investing, social media acts as a powerful catalyst for information cascades and sentiment amplification. Narratives, whether accurate or not, can spread rapidly, influencing thousands of investors simultaneously. Influencers and online communities can create powerful herding effects, driving collective buying or selling waves that decouple asset prices from their fundamental values (Kamil & Tanno, 2022). This high-speed, often unvetted, information environment makes Gen Z investors particularly

susceptible to making decisions based on social trends rather than independent analysis, underscoring its relevance in modern investment behavior.

Financial Literacy

While psychological and social factors can drive irrational behavior, financial literacy is widely recognized as a cognitive buffer that promotes more rational decision-making (Otoritas Jasa Keuangan, 2022). Financial literacy encompasses the knowledge of financial concepts, the ability to manage personal finances, and the confidence to make effective investment decisions. Research shows that higher financial literacy is associated with better risk management, reduced susceptibility to behavioral biases like herding and overconfidence, and a greater ability to process information critically (Amalia & Krisnawati, 2024). In the context of this study, a financially literate investor is better equipped to interpret the FGI not as a command, but as a piece of data to be analyzed. Similarly, they are more likely to critically evaluate information from social media, verifying sources and filtering out noise. Financial literacy, therefore, may function as a "cognitive shield," potentially weakening the link between external stimuli (market sentiment, social media hype) and impulsive decisions, thus warranting investigation as a critical moderating factor.

RESEARCH METHOD

This study employed a quantitative approach with an explanatory research design to test the proposed hypotheses. Data were collected using a non-probability, purposive sampling method, targeting Indonesian Generation Z investors (aged 18-25) who had actively traded cryptocurrencies within the last six months. An online questionnaire was distributed through various investment communities, resulting in a final valid sample of 152 respondents. The sample was predominantly male (77%) and aged between 22-25 years (82.2%), with the majority having more than one year of investment experience (63.2%). All constructs in the research model were measured using multiple items on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. This method was chosen for its suitability for predictive research, its robustness with non-normally distributed data common in survey research, and its ability to handle complex models involving moderating (Hair Jr et al., 2021).

The analysis followed a two-stage approach. First, the measurement model (outer model) was assessed for reliability and validity. Convergent validity was evaluated using outer loadings (threshold > 0.70) and the Average Variance Extracted (AVE) (threshold > 0.50). Internal consistency reliability was assessed using Composite Reliability (CR) (threshold > 0.70).

Second, the structural model (inner model) was evaluated to test the research hypotheses. The significance of the path coefficients, including the interaction terms for the moderation analysis, was determined using a bootstrapping procedure with 5,000 resamples. Hypotheses were supported if the p-value was less than 0.05. The model's predictive power was assessed by the coefficient of determination (R^2), and the overall model fit was evaluated using the Standardized Root Mean Square Residual (SRMR).

RESULTS AND DISCUSSION

Sample Profile and Descriptive Statistics

The study surveyed **152** active Gen-Z crypto investors in Indonesia who had traded in the last six months. The sample is predominantly male (77%) and in the 22–25 age bracket (82.2%). Major exchanges used were led by Indodax (57.2%), followed by Binance (15.1%) and Tokocrypto (14.5%).

Table 1. Respondent profile (gender and age)

Category	Group	n	%
Gender	Male	117	77.0
	Female	35	23.0
Age	18–21	27	17.8
	22–25	125	82.2

Source: Author's calculation based on survey data.

Table 2. Primary exchange/platform used

Exchange	n	%
Indodax	87	57.2
Binance	23	15.1
Tokocrypto	22	14.5
Pluang	11	7.2
Pintu	9	5.9

Source: Author's calculation based on survey data.

Measurement and Structural Model Quality

Reliability and validity of all constructs were satisfactory: Cronbach's Alpha and Composite Reliability exceeded 0.70 for FGI (X1), social media (X2), Investment Decision (Y), and Financial Literacy (Z), meeting recommended thresholds for PLS-SEM. These criteria follow (Hair Jr et al., 2021) guidance for convergent/discriminant validity and internal consistency.

Model fit and explanatory power were adequate: SRMR = 0.069 (good fit), and $R^2(Y)$ = 0.754 (strong), indicating the model explains ~75% of the variance in investment decisions.

Table 3.
Model fit (SRMR) and explanatory power (R^2)

Indicator	Value	Interpretation
SRMR (estimated)	0.069	Good fit
R^2 (Y)	0.754	Strong

Source: SmartPLS 4 output (v.4.1.1.4).

Direct and Moderation Effects

Direct paths were all significant: FGI → Y (β=0.435; p<0.001), Social Media → Y (β=0.218; p=0.003), and Financial Literacy → Y (β=0.436; p<0.001). Moderating effects were also significant and negative: Z×X1 → Y (β=−0.178; p=0.047) and Z×X2 → Y

(β=−0.154; p=0.012), implying financial literacy attenuates the influence of FGI and social media on investment decisions.

Table 4.
Direct effects (path coefficients, bootstrapping)

Path	β (O)	T	p
X1 → Y (FGI → Decision)	0.435	5.652	0.000
X2 → Y (Social Media → Decision)	0.218	2.996	0.003
Z → Y (Financial Literacy → Decision)	0.436	6.414	0.000

Source: SmartPLS 4 output (v.4.1.1.4).

Table 5.
Interaction effects (moderation by financial literacy)

Interaction	β (O)	T	p
Z × X1 → Y	−0.178	1.989	0.047
Z × X2 → Y	−0.154	2.517	0.012

Source: SmartPLS 4 output (v.4.1.1.4).

Discussion

FGI's positive effect on investment decisions supports behavioral-finance views that market sentiment shapes actions in high-volatility assets. The result aligns with evidence that fear/greed dynamics co-move with crypto trading intensity and prices (Gaies et al., 2023), reinforcing sentiment's role among Gen-Z investors.

Social media's positive effect indicates that information flows—frequency of exposure, influencer opinions, and community discussions—translate into investment actions, consistent with prior work on digital content effects and herd behavior in young investors. The sample's platform choices (Table 2) also reflect a tightly networked market where information diffuses rapidly across local exchanges.

Financial literacy's positive direct effect suggests more literate investors make more deliberate and risk-aware choices (e.g., verification, diversification), in line with Indonesian evidence linking literacy to better decision quality (Baihaqqi & Prajawati, 2023).

Crucially, literacy attenuates (negative β) the effects of both FGI and social media. This pattern is theoretically coherent: literacy functions as a cognitive filter that tempers emotion-driven reactions and reduces susceptibility to opinion cascades, echoing moderation findings in related investing contexts and the behavioral framework in (Bodie et al., 2023). From a methods standpoint, these inferences rest on a well-specified PLS-SEM with strong reliability/validity and acceptable fit, following (Hair Jr et al., 2021)

CONCLUSION

This study finds that market sentiment, measured by the Fear and Greed Index (FGI), exerts a strong and positive effect on Generation Z's cryptocurrency investment decisions, and social media information also positively influences those decisions (FGI β=0.435, p<0.001; Social Media β=0.218, p=0.003). Financial literacy has a direct positive effect on investment decisions (β=0.436, p<0.001) and significantly moderates the impact of both FGI

and social media by attenuating their influence-i.e., higher literacy reduces investors' susceptibility to sentiment and social-driven impulses (interaction Z×X1 β=−0.178, p=0.047; Z×X2 β=−0.154, p=0.012). These empirical results are based on a PLS-SEM analysis of 152 active Gen Z crypto investors using SmartPLS 4 (v.4.1.1.4).

Theoretically, the findings extend behavioral finance and prospect theory literature by empirically demonstrating how an aggregate sentiment index (FGI) and rapid, networked social information jointly shape decisions in digital-asset markets and by showing financial literacy functions as a cognitive buffer that modifies these behavioral channels. This advances prior work on investor bias and moderation effects by integrating sentiment indices, social media dynamics, and literacy within a single predictive model for an emerging-market, Gen Z sample.

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