FINANCIAL DETERMINANTS OF INVESTMENT DECISION MAKING IN FRAUDULENT SCHEMES WITH SCAM AWARENESS AS A MEDIATING VARIABLE AND RISK TOLERANCE AS A MODERATING VARIABLE

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Abstract: This study explores how financial literacy, financial behavior, and financial stress influence investment scam awareness, as well as how this awareness shapes investment decisions among Generation Z in Indonesia. This study applies Protection Motivation Theory (PMT) to explain how threat recognition and coping responses explain investors' behavior. Quantitative approach was used for this research with data sourced using an online questionnaire survey distributed to Generation Z investors in Indonesia through purposive sampling method. The data were evaluated using Structural Equation Modeling Partial Least Squares (SEM-PLS) using SmartPLS 4 to test the relationships between variables. The findings indicate that financial literacy has a positive and significant effect on investment scam awareness, allowing individuals to better recognize fraudulent schemes. In contrast, financial behavior and financial stress show no significant effect on awareness of investment scams. Furthermore, scam awareness does not directly affect investment decisions, but risk tolerance was proven to moderate this relationship. These findings show that although financial literacy improves scam awareness, investment decisions are also shaped by other factors. This work offers additional insight to existing literature by delivering a deeper understanding of how financial determinants shape investment decision-making in fraudulent investment contexts, especially among Generation Z investors in Indonesia.

Keywords: *Financial Literacy, Investment Scam Awareness, Investment Decisions, Risk Tolerance, Generation Z*

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1. Introduction

Investigations towards investment scams have been conducted both nationally and internationally (Kasim et al, 2023; Lev et al., 2022). In Indonesia, OJK received over 72,000 complaints regarding digital frauds, including skimming, phishing, social engineering, and sniffing (Pajow & Polontoh, 2024). These types of digital fraud serve as an entry point for investment scams, where scammers use social media, fake websites, and persuasive testimonials to make fraudulent investment offers more attractive (Ramli et al., 2023). Ramli et al. (2023) also explain that scammers often manipulate social media by creating fake investment companies that promise high returns, attracting victims through social media posts,

links, and fake news articles, which are supported by fake testimonials. The rise of digital platforms makes it easier for scammers to spread fraudulent investment offers and manipulate victims using digital clickbait (Zainuddin et al., 2024). This explains why an increase in digital fraud complaints increases the risks of falling for fraudulent investment schemes.

According to Kasim et al. (2023), investment scams can be dangerous, especially in developing countries. At the same time, there is a serious increase in the capital market participation in Indonesia, growing from 2.5 million in 2020 to 12.17 million in 2023 (Yusup & Gunawan, 2024), with continued growth reported by the Indonesian Central Securities Depository (KSEI) until December 2024. This rapid growth shows the rising interest in the investment sector, but also raises concerns. As the number of investors in Indonesia increases, their participation and curiosity toward various types of investment also rise, including those with high risks (Tahir & Danarsari, 2023). Therefore, it is crucial to understand the determinants that influence investors' investment decisions, especially to avoid falling into fraudulent investments. The significant increase in both investor numbers and fraudulent investment cases in Indonesia increases the urgency for this research to further assess factors that can reduce investment decisions in scam instruments.

By the end of December 2024, the capital market investors in Indonesia were dominated by Generation Z, primarily those under 30 years old, and represented around 54.83% of the total (KSEI, 2024). According to Fisu et al. (2024), Generation Z is widely recognized as the generation that was born between the year of 1997-2012 and raised in an environment that was tremendously influenced and surrounded by the internet and technology. Shaped by rapid technological growth, Generation Z enjoys things that are instant and often focuses on quick satisfaction (Chan & Lee, 2023). The tendency to prefer instant solutions drives Generation Z investors to seek quick short-term profits from the market due to their impatience and result-oriented mindset (Chen et al., 2018; Pašiušienė et al., 2023). The impatience aligns with Ponzi scheme tactics, promising high-return opportunities with little risk, which should raise suspicion (Heyman, 2023; Kasim, 2020; Mohammed, 2021). Many investment scams promise high returns in a short period, using these promises as bait to draw in investors (Boyle et al., 2025). Therefore, understanding investment decisions is a crucial aspect in protecting this vulnerable group. According to Rahman & Gan (2020), an investment decision is usually described as the allocation of funds into assets for future returns, often requiring sacrifice of short-term benefits. These decisions influence both financially and emotionally (Vuković & Pivac, 2023).

Previous studies highlighted that investment decisions are determined by different factors, including financial behavior (Adil et al., 2021; Nugraha et al., 2022; Purwidianti et al., 2023), financial literacy (Gui et al., 2021; Nugraha et al., 2022), and financial stress (Kasim et al., 2023; Obamuyi et al., 2018; Ramadhan, 2025). Financial behavior affects psychological and behavioral biases that often lead to irrational decisions (Adil et al., 2021; Purwidianti et al., 2023). While financial literacy is recognized as an important component that shapes people's financial decision-making ability, and the condition of limited financial knowledge and understanding potentially leading individuals to fall victim due to poor risk assessment (Gui et al., 2021; Padil et al., 2021). This underlines the importance of financial literacy in helping people make smarter and safer investment decisions (Padil et al., 2021). Financial stress also shapes decision-making since people struggling with financial difficulties have a higher tendency to engage in high-return investments in hopes of improving their current situation (Kasim et al., 2023; Jack & Ibekwe, 2018). In the midst of the COVID-19 pandemic, the

financial crisis increased fraudulent investment cases (Ibekwe et al., 2021). This argument is validated by Ahmed et al. (2025), who found that financial stress grew significantly during the COVID-19 era. Stress reduces critical thinking and increases risky decisions, which makes them more exposed to investment scams (Kasim et al., 2023; Obamuyi et al., 2018).

However, the existing academic findings appear to be inconsistent concerning the correlation between financial behavior, financial literacy, and financial stress towards investment decisions. Research from Dinarjito (2023) found that overconfidence, herding, and loss aversion, as part of financial behavior factors, do not affect investment decisions. Yet, some studies found no link between financial literacy and investment decisions (Hala et al., 2020; Arianti, 2018), while others reported a positive effect (Nugraha et al., 2022). Evidence of financial stress directly influencing investment decisions remains limited, yet research done by Ismail & Zaki (2019) proves that financial stress affects how people control their finances, which makes them more likely to take risky financial decisions when under financial stress. Financial stress changes people's attitudes, social norms, and sense of control as a response to the uncertainty, which could push them to make riskier investment decisions (Heo et al., 2020; Ramadhan, 2025).

Previous studies that examined how financial aspects influence people's investment decisions have indicated a possible indirect relationship between these variables. There are many factors to consider, but this research focuses on the need to test awareness of investment scams as the mediator variable, since in previous studies, the variable has served in a different role. In a study done by Kasim et al. (2023), awareness of investment scams is positioned as the dependent variable, while Padil et al. (2021) reported that it does affect investment decisions. In addition, several studies show inconsistent results between financial behavior, financial literacy, and financial stress toward investment decisions. These inconsistencies show the importance of mediation variables in explaining the process of how these financial aspects, as independent variables, influence investment decisions as the dependent variable (MacKinnon et al., 2007; Sivalogathasan & Jahufer, 2024). The inconsistencies of role and result serve as the basis of this research to test the awareness of investment scams as a mediator that connects financial behavior, financial literacy, and financial stress to investment decisions in avoiding fraudulent schemes.

To conclude, Indonesia's rising number of young investors is accompanied by increased exposure to investment scams. Generation Z's tendency to seek a quick return makes them more vulnerable to fraudulent investment (Chen et al., 2018; Pašiušienė et al., 2023). Given the condition, this research aims to explore the mediation factor of investment scam awareness within the relationship between financial behavior, financial literacy, and financial stress in affecting investment decisions as well as how the moderator of risk tolerance contributes in the relationship between awareness and investment decisions.

This study contributes by offering a more comprehensive view of investment decision making especially in avoiding fraudulent schemes by combining psychological and financial aspects. Previous studies not clearly positioned awareness as a mediating variable and risk tolerance in the same model, which makes this research different from previous findings. The outcomes are intended to strengthen the theoretical basis of Protection Motivation Theory (PMT) especially in explaining how people result in taking protective investment decisions. In addition, it also expected to offer insights that can result in improving financial education and fraud prevention programs among young investors towards fraudulent investment risks.

2. Literature Review
2.1. Protection Motivation Theory (PMT)

Protection Motivation Theory (PMT), originally developed by Rogers (1975), is regularly considered for its ability to explain how individuals respond when they recognize threats (Rogers, 1975; Yilmaz, 2023). PMT is commonly applied in marketing and behavioral finance to understand how people react to financial risks and protective investment decisions (Rajendran & Shenbagaraman, 2017; Yilmaz, 2023). PMT is relevant in this study because it helps explain how individuals respond and deal with threats in decisions related to the investment context specially to avoid scams. In the context of investment decisions, especially to avoid investment scams, PMT suggests that when investors recognize a high threat, they are more likely to adopt protective behavior. Proven by research of Padil et al (2021), which stated that when people are more aware of investment scams, they have more tendency to choose safer investment decisions. This is a way for people to protect themselves by seeking more information to avoid fraudulent investments. The previous statement is also supported by Tsang et al (2023), where PMT suggests that when people are in a dangerous or threatening condition, they are motivated to protect themselves since they are aware that it is likely to affect them. In this study, PMT will help explain how Generation Z investors respond through their investment decisions towards threats like investment scams when they are aware of them. This theory is considered a reliable way to predict how people act to protect themselves (Anderson & Agarwal, 2010).

In this study, investment scams are seen as a threat. PMT helps explain how people evaluate the risk of investment scams and how their ability to cope influences their investment decisions. According to Protection Motivation Theory, people evaluate a threat through two stages, including threat appraisal and coping appraisal (Lin et al., 2022). Threat appraisal helps explain how people evaluate the likelihood of a threat, while coping appraisal explains how people assess their ability to respond or cope with it (Lin et al., 2022). These processes explain how financial behavior, financial literacy, and financial stress shape investment scam awareness and influence the investment decisions of an individual. Financial stress is connected to the threat appraisal process, as people under financial pressure tend to feel more vulnerable to financial risks, which can reduce their awareness of potential scams. Besides, financial literacy and financial behavior are linked to coping appraisal since both show the ability to manage risks, analyze investment options, and respond through the decision-making process. Investment scam awareness is positioned as the outcome of these appraisals, influencing how people respond when making investment decisions to avoid fraudulent offers. In addition, risk tolerance moderates this relationship by influencing whether awareness influence the protective actions.

2.2. Financial Behavior to Awareness of Investment Scams

Financial behavior is defined as any actions or patterns of behavior related to managing money, including the use of cash, credit, and savings (Sabri et al., 2022). It is known as how people manage or control their savings, spending, and budgeting (Rey-Ares et al., 2021; Sabri et al., 2022). According to Abdallah et al (2024), any behavior, actions, and decisions made by individuals related to financial management are defined as financial behavior.

Investment scam awareness involves recognizing the signs of fraudulent investments and understanding the tactics used (Padil et al., 2020). People with a stronger pattern of financial behavior, specifically those who are good at savings and financial planning, are better prepared

to identify potential risks in investment options because this behavior requires careful consideration of long-term goals, risk evaluation, and the urgency to protect financial resources. Being able to identify risks of financial products increases the awareness of people towards fraudulent investment signs and tactics. Limited studies are exploring the relationship between financial behavior towards investment scam awareness. However, research done by Kasim et al. (2023) reveals that among retirees, financial behavior does not significantly affect awareness of investment scams, while another study by Dinar (2024) found that several financial behavior aspects are proven to be able to affect the awareness of investment scam within Generation Z workers.

Due to the limited number of existing researches that tested the relationship between them, this research is design to investigate the correlation between financial behavior on investment scam awareness among Generation Z in Indonesia. A previous study by Dinar (2024) explains that Generation Z workers who exhibit strong financial behavior were better able to assess investment offers. This aligns with the idea that people who practice strong financial behavior have the skills needed to be able to identify risks that associated with investment scams. As people with good financial behavior tend to pay attention to how financial products work and evaluate the credibility, it increases their awareness of fraudulent investment offers.

According to Protection Motivation Theory, people with strong financial behavior have higher threat appraisal and coping appraisal. Their threat appraisal allows them to be able to recognize the potential risks of fraudulent offers, while coping appraisal indicates their confidence in handling those risks. This awareness process happens before they make any investment decisions, since people critically evaluate warning signs and activate their sense of alert on possible scams. Thus, people with good financial behavior are not only capable of managing money effectively but also better aware of fraudulent schemes because they evaluate investment offers critically, as well as the consequences, since it could affect their financial well-being. From these reasoning, the hypothesis below is established:

H1: There is a significant relationship between financial behavior and awareness of investment scams.

2.3. Financial Literacy to Awareness of Investment Scams

Maheshwari et al. (2023) explained that financial literacy represents the ability and capacity of people to understand information related to economic and financial matters to make better decisions regarding financial planning, saving, debt management, and retirement. Financial literacy reflects people understanding of basic concepts in economics and finance, combined with the capacity to implement the understanding and skills needed to manage money and support long-term stability of financial well-being (Chowdhury et al., 2024; Muat et al., 2025). People with higher financial literacy are able to evaluate different financial options, prepare for the upcoming financial needs, and respond to various financial conditions effectively (Rahman et al., 2021).

A high and strong level of financial literacy is necessary in recognizing potential risks and identifying fraudulent investment schemes. People with better financial knowledge can critically evaluate financial market offers, detect warning signs of scams, and make safer financial decisions (Yusup & Gunawan, 2024). The Protection Motivation Theory supports this idea by suggesting that people with advanced knowledge about financial threats are more likely to recognize potential scams and take preventive actions as a result. According to PMT, people with higher financial literacy demonstrate stronger coping appraisal, which shows their ability

to process information, evaluate risks, and respond to financial threats such as fraudulent investment schemes (Rogers, 1975; Lin et al., 2022). Their understanding of financial instruments motivates them to adopt protective actions by being more careful towards suspicious offers.

Further supporting this, two different studies done by Kasim et al. (2023) prove that financial literacy appears to significantly affect awareness of investment scams. Both findings imply that improving financial literacy significantly improves the awareness of potential scams, helping individuals protect themselves from fraudulent investments. In this study, the desire for quick returns of Generation Z points out the value of financial literacy in improving their awareness and ability to avoid falling into fraudulent investment schemes. Additionally, people with better financial literacy are more capable of detecting and recognizing potential signs that involved investment fraud. Based on these findings, the hypothesis below is proposed:

H2: There is a significant relationship between financial literacy and awareness of investment scams.

2.4. Financial Stress to Awareness of Investment Scams

Rodrigues et al. (2023) described financial stress as an uneasy feeling that comes when a person struggles to meet daily needs or manage both short and long-term financial responsibilities, due to limited income, debt, job loss, financial insecurity, or other economic challenges. This psychological pressure not only reduces person's well-being but also weakens the ability to think critically and assess risks clearly (Dziwornu & Mawuena, 2025; Guan et al., 2022). As a result, people under financial stress may fail to notice warning signs and become more vulnerable to fraudulent investment offers (Kasim et al., 2023; Obamuyi et al., 2018).

During difficult times of economic instability, particularly the COVID-19 pandemic, the financial crisis increased fraudulent investment cases (Ibekwe et al., 2021). When people feel pressured to secure their finances quickly, they tend to be less careful and more easily influenced by persuasive tactics used in scams. This condition shows that financial stress can reduce the level of awareness of fraudulent investment because people under pressure tend to ignore potential threats to gain quick financial solutions.

According to Protection Motivation Theory (PMT), financial stress is linked to the threat appraisal process. People who experience financial stress tend to be more vulnerable to financial risks, which reduces their coping appraisal. When coping ability is low, people become less careful which can lead into impulsive behavior. Furthermore, people under financial stress may see investment offers as opportunities rather than threats, due to their urgent need for financial solutions (Kasim et al., 2023). This condition prevents them from being able to recognize warning signs and lowering their awareness process. Thus, financial stress affects awareness of investment scams by reducing people's capacity to critically evaluate and analyze investment offers. Based on these findings, the following hypothesis is proposed:

H3: There is a significant relationship between financial stress and awareness of investment scams.

2.5. Awareness of Investment Scams to Investment Decisions

Awareness of investment scams is related to the knowledge and understanding that people have about fraudulent investments, which can be developed through education, personal

experience, or information (Lee et al., 2018; Padil et al., 2021). It includes recognizing common signs of investment scams, such as promises of unrealistic high returns with no risk investment. Awareness of these characteristics of scams helps people make safer investment decisions since it prevents them from falling into fraudulent investments.

According to Protection Motivation Theory (PMT), when people recognize threats, they are driven to adopt protective behaviors to protect themselves (Rogers, 1975). In this research, awareness of investment scams indicates the recognition stage of financial threat, which activates the protection motivation of individuals and influences them to make protective investment decisions. When Generation Z becomes aware of the risks of scams, they have a higher tendency to protect themselves as a result by seeking and analyzing more information, being more careful when choosing between investment options, and avoiding offers that seem unrealistic. PMT highlights that people who are aware of potential threats tend to adopt protective actions, such as making safer and careful decisions, especially in avoiding fraudulent investment schemes.

For Generation Z, who often seek quick returns which more vulnerable to scams, awareness of investment scams plays a critical position in shaping their investment decisions. Being aware of the risks correlated with high-return investments helps Generation Z set more realistic expectations for returns. This awareness allows them to avoid making impulsive and risky decisions that could lead them to experience financial losses. Therefore, awareness of investment scams influences Generation Z's investment decisions by guiding them to make safer investment decisions especially in avoiding fraudulent investments since they are able to recognize those potential risks and scams. From this reasoning, the hypothesis below is developed:

H4: There is a significant relationship between awareness of investment scams and investment decisions.

2.6. Risk Tolerance as the Moderator between Awareness of Investment Scams and Investment Decisions

Being aware of investment scams helps investors recognize warning signs and avoid suspicious offers, which leads to safer investment decisions (Padil et al., 2021; Özçelik & Kurt, 2024). However, the awareness itself cannot determine how people act, as their tolerance for risk also serves as an important aspect. Risk tolerance is the level of comfort people has when taking financial risks (Ishfaq et al., 2020). According to Protection Motivation Theory (PMT), being aware of threats can encourage people to be more careful and take protective action. Yet, whether this awareness turns into safer investment decisions also depends on people's risk tolerance. Those with lower risk tolerance tend to act carefully, while those people with higher tolerance may still pursue risky investments despite being aware of the potential fraud. This shows that risk tolerance potentially weakens or strengthen the impact of scam awareness on investment decisions.

Findings from existing studies reported that risk tolerance directly impacts investment decisions (Ishfaq et al., 2020; Samsuri et al., 2019). Besides, awareness of investment scams helps people recognize risks and adopt protective behaviors (Özçelik & Kurt, 2024). Based on this, risk tolerance is expected to serve as a moderating role between scam awareness and investment decisions in avoiding fraudulent investments. Consequently, the hypothesis below is established:

H5: Risk tolerance moderates the relationship between awareness of investment scams and investment decisions.

2.7. Awareness of Investment Scams as the Mediator between Financial Behavior, Financial Literacy, Financial Stress, and Investment Decisions

Investment decisions are shaped by various factors, including financial behavior (Adil et al., 2021; Nugraha et al., 2022; Purwidianti et al., 2023), financial literacy (Gui et al., 2021; Nugraha et al., 2022), and financial stress (Kasim et al., 2023; Obamuyi et al., 2018; Ramadhan, 2025). Within this research, investment scam awareness is positioned as a mediating variable between these financial aspects to investment decisions.

People with a higher level of financial behavior tend to critically evaluate and analyze financial products before making decisions, which helps them become more aware of potential risks and warning signs of investment scams (Adil et al., 2021; Purwidianti et al., 2023). Higher financial literacy strengthens this awareness by allowing people to recognize the characteristics of fraudulent schemes and assess whether an investment offer is trustworthy (Arora and Chakraborty, 2023; Utami and Sitanggang, 2021; Waheed et al., 2020). Besides, people under financial stress tend to be less aware and more vulnerable to scams due to the pressure of gaining quick returns in a short time (Kasim et al., 2023; Jack & Ibekwe, 2018).

Therefore, awareness of investment scams is a mediating variable that connects these financial aspects to investment decisions. People with better financial literacy and financial behavior build higher awareness regarding scams, which leads to better and safer investment decisions, especially in avoiding those fraudulent schemes. While financial stress can weaken awareness and increase the vulnerability of falling into fraudulent investment schemes. Thus, this study develops the following hypotheses:

H6a: Awareness of investment scams mediates the relationship between financial behavior and investment decisions
H6b: Awareness of investment scams mediates the relationship between financial literacy and investment decisions
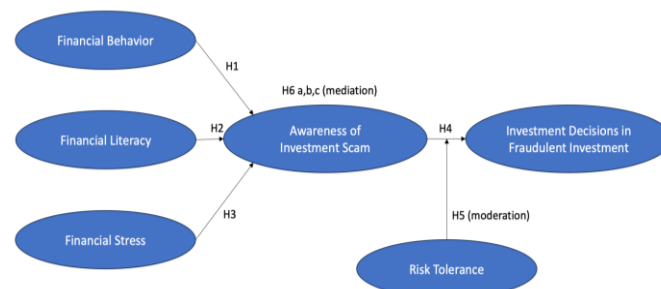*H6c: Awareness of investment scams mediates the relationship between financial stress and investment decisions*

Figure 1. Research Model
Source: Author's own work (2025)

3. Research Method
Variables and Measurements

The questionnaire items applied to evaluate the constructs of this research were adapted from Rahman et al. (2021) for financial behavior and financial stress, Giraldo et al. (2024) for financial literacy, Ling (2023) for awareness of investment scams, Ahmad (2020) for

investment decisions, and Rahman et al. (2019) for risk tolerance. A five option Likert scale was utilized to represent all variables, from 1 (strongly disagree) to 5 (strongly agree). Likert scale is broadly adopted as a fundamental psychometric tool within the area of education and social sciences research (Joshi et al., 2015). The constructs and measurement items were adapted and adjusted so that they align with the research focus and questions of this study thus it fits with the target respondents. The online questionnaire of this study was structured into 7 sections. The opening part of the questionnaire captured the respondents' information regarding the demographic background. While sections 2 to 7 included items that assessed the level of financial behavior, financial literacy, financial stress, awareness of investment scams, investment decisions, and risk tolerance of all respondents, using a five option of Likert Scale, with a few modifications. The modifications were made to make the questionnaire more understandable and to minimize misperception.

Sample and Data Collection

This study uses a quantitative approach since it concentrates on gathering and examining numerical data intended to evaluate the variables' relationships. Slater (2024) mentioned that quantitative research methods use tools to be able to test hypotheses in a clear and trustworthy way by collecting information transparently, making sure the data and measurements are valid and reliable. The process of collecting data was performed by distributing an online questionnaire designed with the Google Form platform, which give participants the flexibility to complete the survey at any time that was convenient for them (Nayak and Narayan, 2019). The method helps ensure that the data collected for this research was accurate based on respondents' knowledge and understanding. The target population was Generation Z individuals living on Java Island in Indonesia who have either invested before or have experienced investment scams, as this group dominates Indonesia's capital market and is vulnerable to fraudulent investments. The inclusion of potential victims is based on the characteristics of Generation Z, who often seek quick returns, making them more susceptible to falling for fraudulent investments. Wu et al. (2022) described that distributing questionnaires to a well-defined target population can improve the response rate and data quality in a positive way. Therefore, only individuals who qualified and fulfilled the criteria of having previous experience in investments or having been involved in investment scams were invited to complete the survey.

In this research, a non-probability sampling was used, specifically the purposive sampling method, where participants are included according to the relevance of this study criteria. The criteria that participants need to fulfill are Generation Z, who have either invested before or have experienced investment scams. The minimum acceptable sample size was determined through the G*Power software, with a power set at 0.90, effect size 0.1, and a 5% significance level, providing in a minimum of 108 participants. A total of 112 valid responses that met the criteria were gathered and processed for analysis, fulfilling the required minimum number of respondents.

Data analysis

All analytical procedures in this study were run through SmartPLS version 4 with the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. The respondents' profile was also summarized to present their demographic information. According to Hair et al. (2019), PLS-SEM is considered suitable for this research since it facilitates the examination of complex relationships among variables.

Measurement Model

This study assessed the measurement model to verify its reliability and validity. The reliability assessment relied on Cronbach's alpha, composite reliability, and rho_A, where values higher than 0.70 reflect internal consistency reliability (Hair et al., 2019). Validity is verified through both convergent and discriminant validity. The analysis of validity that concentrates on convergent validity verified through the average variance extracted (AVE) values (Hair et al., 2022). Convergent validity was established if the average variance extracted (AVE) was above 0.50 (Hair et al., 2022). To test discriminant validity, this research used the heterotrait–monotrait ratio of correlations (HTMT) to make sure that constructs were distinct from each other, because it has been proven to delivers a more reliable outcome than the traditional methods that using the Fornell–Larcker criterion or cross-loadings, which often fail to confirm validity issues (Hair et al., 2022). Discriminant validity is established when the HTMT values are below 0.90, indicating that the constructs are clearly differentiated from one another (Hair et al., 2022).

Structural Model

In PLS-SEM, checking for possible multicollinearity utilizing the variance inflation factor (VIF) is important because when predictors are highly correlated, it is also capable to impact the accuracy of estimates and standard errors (Hair et al., 2019). According to Hair et al. (2019), acceptable VIF values are typically below 3, while values between 3 and 5 may indicate concern, but they still can be used, and VIF scores above 5 indicate serious multicollinearity (Hair et al., 2019; 2022). In this study, VIF values were tested to confirm that the predictor did not show problematic collinearity before testing the structural model analysis.

After validating the multicollinearity issues, analysis of the structural model was conducted to confirm the relationship of proposed hypotheses. In this study, the testing of hypotheses was performed by the examination of path coefficients together with their statistical significance. The path coefficients (original sample estimates) describe both the strength and direction of the relationship among the variables. Bootstrapping with 5,000 resamples was used to find the significance of the relationships, providing the t-statistics and p-values (Hair et al., 2022). A relationship is identified as significant when the p-value is below 0.05 or when the confidence interval does not include zero.

Both direct and indirect effects were examined. Mediation analysis was managed to test the role of mediator, awareness of investment scams, between financial behavior, financial literacy, and investment decisions. The mediation effect was considered supported if the indirect path was significant and complemented or substituted the direct effect, tested through bootstrapping with 5,000 subsamples (Hair et al., 2022).

The moderating effect of risk tolerance was also evaluated to determine whether it affects the relationship between investment scam awareness and investment decisions. The moderation analysis was examined through the use of product indicator approach (Hair et al., 2022). A moderation effect is recognized significant when the p-value is below 0.05 or when the confidence interval does not include zero.

To evaluate the model's explanatory power, the coefficient of determination (R^2) was used, where values of 0.75, 0.50, and 0.25 represents substantial, moderate, and weak explanatory power, in order (Hair et al., 2019). Predictive relevance (Q^2) was determined with the blindfolding test, in which values above zero show predictive capability and higher values represent stronger prediction (Hair et al., 2017). Effect size (f^2) was also measured to define

each predictor's contribution to the dependent variables, where values of 0.02, 0.15, and 0.35 viewed as small, medium, and large effects (Hair et al., 2022).

4. Result and Discussion
4.1. Result

Table 1 presents the participants profile specifically explain the participants' demographic characteristics. The table shows that all of them already meet the criteria as Generation Z, whose ages ranged from 17-28 years old. The gender was dominated by female respondents at 58.93% and 41.07% of male respondents. In terms of domicile, all of the respondents were living on Java Island. In addition, of 112 respondents in total, 41.07% were the victims of investment fraud.

Table 1. Respondents Profile

Demographics	Characteristics	Frequency	Percentage
Age	17-28 years old (Gen Z)	112	100%
Gender	Male	46	41.07%
	Female	66	58.93%
Domicile	Java Island	112	100%
Fraud Victimization	Yes	46	41.07%
	No	66	58.93%

Source: Author's own work (2025)

Table 2 presents the constructs, items, references, and outer loadings values obtained from the analysis. All items demonstrate acceptable outer loading values that are above the defined threshold value of 0.70, revealing that they are valid indicators in representing each construct.

Table 2. Variables, Items, and Outer Loadings of the construct

Variables	Items	Outer Loadings	References
Financial Behavior			
FB5	I must cut my living expenses.*	0.768	Rahman et al. (2021)
FB6	I run into financial troubles because I do not have enough money.*	0.869	
FB9	I cannot afford to do things I would enjoy doing.*	0.736	
Financial Literacy			
FL1	I consider myself knowledgeable on financial services (banks).	0.805	Giraldo et al. (2024)
FL2	I possess good knowledge of financial planning services and products.	0.715	

FL3	I can recall bank-specific attributes (differentiators) of the various banks.	0.757	
FL5	I have knowledge of inflation.	0.758	
FL6	I have knowledge of risk diversification.	0.716	
Financial Stress			
FS1	I feel stress about my personal finances in general.	0.883	Rahman et al. (2021)
FS2	I worry about being able to fulfil monthly financial commitment.	0.837	
FS3	I worry about having enough money to pay for daily expenses.	0.777	
FS4	I feel stress thinking about the total amount of money that I owe.	0.851	
FS6	I feel helpless in dealing with the financial problems in my life.	0.775	
Awareness of Investment Scams			
AIS1	I can potentially fall victim to scams when investing in stocks/high-risk assets on unreliable exchanges.	0.756	Ling (2023) with modification
AIS2	I understand that any investment scheme promising abnormally high returns is not trustworthy.	0.838	
AIS3	I am aware that investments guaranteeing consistent positive returns regardless of overall market conditions are not to be trusted.	0.773	
Investment Decisions			
ID1	I frequently participate in speculative or high-return investment schemes.	0.840	Ahmad (2020) with modification
ID2	I prefer high-yield, unregulated investments over traditional, lower-risk options.	0.846	
ID3	I invest in unverified or high-risk assets, such as offshore funds, cryptocurrency schemes, or multi-level investment programs.	0.807	
ID4	I commit money to long-term investments with unclear financial backing and high promised returns.	0.847	
Risk Tolerance			

RT1	If I believe an investment will carry profit, I am willing to borrow money to make this investment.	0.905	Rahman et al. (2019)
RT2	I believe I need to take more financial risks if I want to improve my financial position.	0.871	

(*) indicates a reverse variable
Source: Author's own work (2025)

Reliability Test

Internal consistency reliability was performed using Cronbach's alpha, rho_A, and composite reliability (rho_c). The analysis outcomes show that all Cronbach's alpha values were range from 0.701 to 0.885, exceeding the minimum acceptable level of 0.70. Furthermore, rho_A values ranged from 0.717 to 0.905, and composite reliability values fell between the range of 0.832 to 0.914, meaning that all of them meet the recommended range of 0.70 to 0.90. Table 3 provides the detailed findings of the reliability assessment.

Table 3. Results of the reliability test

	Cronbach's alpha	Composite reliability (rho_A)	Composite reliability (rho_c)
AIS	0,701	0,717	0,832
FB	0,708	0,734	0,835
FL	0,814	0,849	0,866
FS	0,885	0,905	0,914
ID	0,857	0,875	0,902
RT	0,734	0,745	0,882

Source: Processed Data (2025)

Validity Test

Convergent validity for each construct was evaluated using the Average Variance Extracted (AVE) for all indicators, with the value exceeding 0.50 (Hair et al., 2022). Table 4 reveals the results of each AVE value that exceeds 0.50, confirming the presence of convergent validity in this model. Discriminant validity was evaluated using the heterotrait–monotrait ratio of correlations (HTMT). The results of HTMT show that all values fall between 0.126 to 0.890, which are lower than the conditions of 0.90 (Table 5). These results confirmed the presence of discriminant validity in the research model.

Table 4. Results of average variance extracted for convergent validity analysis

Construct	Average Variance Extracted (AVE)
Awareness of Investment Scam	0.624
Financial Behavior	0.629
Financial Literacy	0.564
Financial Stress	0.681

Investment Decisions		0.697
Risk Tolerance		0.789

Source: Processed Data (2025)

Table 5. Heterotrait-Monotrait (HTMT) ratio of discriminant validity analysis

	AIS	FB	FL	FS	ID	RT	RT x AIS
AIS							
FB	0,439						
FL	0,413	0,403					
FS	0,344	0,890	0,237				
ID	0,129	0,353	0,465	0,456			
RT	0,134	0,362	0,386	0,530	0,780		
RT x AIS	0,343	0,126	0,117	0,180	0,310	0,235	

Source: Processed Data (2025)

Multicollinearity Test

Before testing the hypotheses, the structural model was reviewed for possible multicollinearity issues. This was done by evaluating the inner VIF values for each predictor construct. As revealed in Table 6, all VIF values fall below the recommended threshold (3 or below), which suggests that there are no multicollinearity issues in this research.

Table 6. Inner Model Multicollinearity

Variables	AIS	FB	FL	FS	ID	RT	RT x AIS
AIS					1.122		
FB	2.140						
FL	1.106						
FS	2.019						
ID							
RT					1.073		
RT x AIS					1.160		

Source: Processed Data (2025)

Path Coefficients and Hypothesis Testing (Direct & Indirect Effect)

Table 7 summarizes the findings from the hypothesis tests, revealing the path coefficients, t-statistics, and p-values for all proposed relationships within the model. The analysis was conducted to determine whether each hypothesis is supported or rejected. The results reveals that financial literacy (FL) positively and significantly impact the awareness of investment

scams (AIS), supporting H2. In contrast, financial behavior (FB) has a negative and insignificant effect. Furthermore, financial stress (FS) has a positive insignificant effect on scam awareness.

On the other hand, awareness of investment scams (AIS) has a negative effect but does not show significant effects on investment decisions. In addition, risk tolerance (RT) was revealed to significantly moderate the relationship between awareness of investment scams and investment decisions, supporting H5. The mediating effects of investment scam awareness on the interactions between financial behavior, financial literacy, and financial stress on investment decisions (H6a–H6c) were not significant. However, the direction of the effects implies that financial behavior has a slight positive effect, while financial literacy and financial stress show a weak negative effect on investment decisions through scam awareness.

Hypothesis	Path	Original Sample	t-statistics	p-values	Statement
H1	FB → AIS	-0.152	1.176	0.239	Rejected
H2	FL → AIS	0.279	3.408	0.001	Accepted
H3	FS → AIS	0.122	0.878	0.380	Rejected
H4	AIS → ID	-0.004	0.042	0.967	Rejected
H5	Moderating Effect of RT on AIS → ID	0.169	2.462	0.014	Accepted
H6a	FB → AIS → ID	0.001	0.032	0.975	Rejected
H6b	FL → AIS → ID	-0.001	0.037	0.970	Rejected
H6c	FS → AIS → ID	-0.001	0.027	0.979	Rejected

Source: Processed Data (2025)

Coefficient of Determination (R^2)

The coefficient of determination (R^2) was applied to measure the explanatory power of the dependent variables. The results show that the R^2 value for awareness of investment scams (AIS) is 0.183, and for investment decisions (ID) is 0.434. The adjusted R^2 values are 0.160 for AIS and 0.418 for ID. This means that the independent variables contribute 18.3% to explain of the variance in investment scam awareness and 43.4% of the variance for investment decisions. Based on Hair et al. (2019), the R^2 value of 0.434 reflects moderate explanatory power, while 0.183 indicates weak explanatory power.

Predictive Relevance (Q^2)

The predictive relevance (Q^2) of this research was tested by applying blindfolding method. The results show that the Q^2 value for awareness of investment scams (AIS) is 0.109, and for investment decisions (ID) is 0.407. Hair et al. (2017) mentioned that Q^2 values exceeding 0 mean the model has predictive capability, where higher values imply stronger predictive

relevance. Using this criterion, the models provide predictive relevance for both dependent variables.

Effect Size (f²)

The effect size (f²) was applied to determine each predictor's contribution to the dependent variable's explained variance (R²) value. The output reveals that the effect sizes range from 0.000 to 0.603. The risk tolerance (RT) construct has the largest effect size on investment decisions (ID) with a value of 0.603. The interaction of RT and AIS shows an effect size of 0.041 on investment decisions (ID). The effect sizes of financial behavior (FB), financial literacy (FL), and financial stress (FS) on awareness of investment scams (AIS) are 0.013, 0.086, and 0.009, respectively, while awareness of investment scams (AIS) has an effect size of 0.000 on investment decisions (ID)

4.2. Discussion

The findings show that financial literacy significantly affects investment scam awareness, while financial behavior and financial stress do not. The effect of financial literacy indicates that respondents with better financial knowledge tend to be more able to identify investment scams and recognize suspicious investment offers, which aligns with the study of Kasim et al. (2023). This also aligned with the Protection Motivation Theory (PMT), where being aware of fraudulent schemes is part of the threat evaluation process. Literacy improves the ability of people to evaluate potential threats and recognize the signs of fraudulent schemes. This supports previous studies (Ahmad, 2020; Ling, 2023), which stated that financial literacy is a protective factor in avoiding scams and is consistent with Giraldo et al. (2024), who also revealed that financial literacy acts as a critical aspect in shaping financial decisions. In contrast, financial behavior and financial stress did not demonstrate significant effects towards investment scam awareness. The reason behind this is that good financial behavior, including budgeting, saving, and managing expenses, focuses on money management, which does not involve the evaluation of fraud risk (Kasim, 2023). Similarly, Generation Z's financial behavior is impacted by lifestyle, literacy, digital skills, attitude, and ethics (Pokharel & Maharjan, 2024), which these factors focus on money management and self-control rather than protection from fraud. This aligns with Dinar and Pramesti (2024), who found that Gen Z's spending and saving behaviors, which are part of the financial behavior, exist as lifestyle patterns. This means that individual will continue to act according to their financial habits regardless of their awareness of fraudulent schemes. This explains why financial behavior has been proven to have a negative and insignificant effect on scam awareness. Moreover, financial stress did not significantly affect investment scam awareness because stress tends to reduce critical thinking, which weakens their ability to recognize fraudulent schemes. (Yang, 2022). Financial stress leads people to make emotionally driven decisions rather than logical threat evaluation (Machado & Almeida, 2024). Under financial pressure, people experience emotional overload and focus more on short-term survival. This implies that financial stress tends to trigger emotional rather than rational responses in individuals. Studies show that stress alone does not improve awareness but can make people more vulnerable by weakening their decision-making (Kasim et al., 2023; Fa-Kaji et al., 2022). Thus, aligned with Protection Motivation Theory, financial stress weakens the ability to recognize fraudulent schemes.

Another finding is that awareness of investment scams shows a negative and insignificant effect toward investment decisions. Based on Protection Motivation Theory (PMT), awareness represents the threat recognition stage, but awareness does not automatically result in adopting

protective coping responses. A study found that although awareness increases knowledge of fraud risks, it does not always lead to fewer fraud cases, due to emotional, social, and situational factors that influence the process involved in making decisions (Jensen et al., 2024). Similarly, research done by Ahmad (2025) found that behavioral biases can reduce the protective effect of awareness, where people ignore the potential threats and still engage in risky investments. Thus, this shows that awareness alone is not enough to change investment decisions. This explains why scam awareness does not directly lead to safer investment decisions.

For the mediating tests, the results show that awareness of investment scams does not mediate the association between financial behavior, financial literacy, financial stress, and investment decisions within Generation Z respondents. Although financial literacy was proven to affect investment scam awareness, validated by studies of Kasim et al. (2023) and Padil et al. (2021), the absence of a significant relationship between scam awareness and investment decisions explains why all of the indirect effects were not supported. From the Protection Motivation Theory (PMT) perspective, the process from threat awareness to protective action seems to be interrupted among Generation Z respondents. Although they are aware of potential investment scams, several factors may prevent this awareness from turning into safer investment decisions. These factors include overconfidence, optimism bias, and low confidence in managing investments, which can reduce their caution (Dinarjito, 2023; Nugraha et al., 2022; Gui et al., 2021). Emotional and impulsive tendencies, such as fear of missing out or preference to seek over high and quick returns, also affect the rational evaluation of risks (Chen et al., 2018; Pašiušienė et al., 2023; Kasim et al., 2023). Social factors, including advice from friends and current social media trends weaken the impact of scam awareness on investment decisions (Fisu et al., 2024; Chen et al., 2018; Pašiušienė et al., 2023).

However, risk tolerances proven to be able to moderate scam awareness on investment decisions. The reason behind is because risk tolerance shapes how people turn their threat recognition into action. Investors that possess a high tolerance of risk may still choose risky investments, although they are aware of potential fraud (Tjondro et al., 2025). Those who demonstrate lower tolerance tend to be more cautious and careful in deciding (Singh et al., 2022; Rajasekar et al., 2022). This shows a consistency related to the Protection Motivation Theory (PMT) concept, revealing that protective responses are affected not only through threats but also by the amount of risk which the investor is comfortable and willing to accept.

Hence, the results prove that awareness of investment does not mediate the linkage between financial behavior, financial literacy, financial stress, and investment decisions within Generation Z respondents. Risk tolerance also affects how Generation Z responds, as high-risk tolerant investors may engage in risky investment, although they are aware of the potential fraud. In addition, these findings reveal that improving financial literacy is not enough because both personal traits and social influence also impact the investment decisions of Generation Z. Therefore, ideas that focus on developing emotional control, critical thinking, and responsible risk taking should be encouraged, especially among young investors like Generation Z. For policymakers and financial institutions, the results show the importance of strengthening investor education that focuses not only on financial knowledge but also on behavioral and psychological aspects. Increasing digital financial literacy and strictly monitoring of online investment offers and promotions are crucial to better prevent young investors from falling into fraudulent schemes.

5. Conclusions

This research aims to explore how financial behavior, financial literacy, and financial stress impact how Generation Z in Indonesia make investment decisions, with awareness of investment scams as a mediating variable and risk tolerance as a moderator. The results show that financial literacy positively and significantly impact investment scam awareness, while financial behavior and financial stress do not. This finding indicates that Generation Z investors who demonstrates stronger capacity of financial literacy tend to have a stronger ability to identifying fraudulent investment offers and potential risks, align with the Protection Motivation Theory (PMT), where financial literacy serves as a key factor in the ability of recognizing threats.

However, awareness of investment scams fails to demonstrate effect on investment decisions. Although Generation Z investors may be aware of the potential of scams, the awareness alone is not enough to change their decisions. As the result, awareness does not mediate the relationship between financial behavior, financial literacy, and financial stress with investment decisions. The findings also reveal that risk tolerance is able to moderate the relationship between awareness of investment scams and investment decisions. Investors with higher risk tolerance tend to be engage and participate in risky investments, although they acknowledge the potential fraud, while those with lower risk tolerance are more careful and selective.

These findings still have certain limitations that highlight potential opportunities for future research. Considering the R^2 values for awareness of investment scam (0.183, adjusted $R^2 = 0.160$) and (0.434, adjusted $R^2 = 0.418$) for investment decisions, indicate that the model can only explain these variables relatively low to moderate level. The evidence shows that the independent variables analyzed here can not fully explain the dependent variable, which means there are additional factors that potentially contribute to form investment decisions, especially for the context of avoiding fraudulent investments. To conclude, this study uses self-reported data gathered through online questionnaires, which possibly contain response bias. In addition, the scope of this research is limited to Generation Z who live on Java Island, which may also limit the scope of the findings to other regions or age groups. Upcoming research can include respondents from different areas or countries to provide a broader comparison. Lastly, this study only examines financial behavior, financial literacy, and financial stress as the main factors. Future research can include other behavioral aspects, including overconfidence or loss aversion, to further explore a deeper and better understanding of the determinants that shape investment decisions and investment scam awareness among investors.

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