

Investment Mindset: Unveiling Behavioral Bias, Enhancing Financial Literacy, and Delving into Risk Perspectives in Stock Investment Decisions

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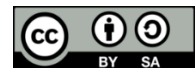
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ABSTRACT

Effective investment decision-making requires rational analysis, but is often influenced by psychological biases such as overconfidence and herding. This study examines the stock investment decisions of Generation Z in East Java, an age group closely tied to technology. The focus is on analyzing investment behavior, particularly the influence of overconfidence and herding bias, as well as the impact of financial literacy, through the mediation of risk perception. The study was conducted on 228 respondents aged 18–25 years who invested in the Indonesian Stock Exchange. Data collection and analysis used the SEM-PLS method through SmartPLS software. The results of the study indicate that risk perception is able to mediate the relationship between herding and overconfidence bias with investment decisions. However, risk perception cannot mediate the relationship between financial literacy and investment decisions. These findings contribute to the understanding of financial behavior, as well as guide Generation Z investors in making wiser investment decisions through a theoretical framework based on risk perception.

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1. INTRODUCTION

Generation Z is a generation that grew up amid rapid technological advancements, making it easier for them to adapt to the use of digital technology. However, this generation is also susceptible to the fear of missing out (FOMO) phenomenon, which causes them to tend to follow trends, including in investment decisions [1]. Results of the national strategy survey on Indonesian financial literacy [2] shows that the financial literacy index of Indonesian society reaches only 38.03%, while the financial inclusion index in Indonesia stands at 76.19%. This indicates an imbalance in knowledge and practice within society, which allows for behavioral bias in decision-making. Indeed, rational investment decisions play a crucial role in determining investment outcomes [3], [4], [5]. Various studies show that psychological biases such as overconfidence and herding, as well as the level of financial literacy, influence investment behavior [6], [7], [8]. Overconfident investors tend to be too confident and ignore market information [9], [10]. Meanwhile, investors exhibiting herd bias are more likely to follow the decisions of others, particularly in situations where market information is uncertain [11], [12], [13], [14]. This condition may result in poor decision-making, potentially causing financial losses or missed investment opportunities [15].

Several studies show that herding bias significantly influences investment decisions, where investors tend to follow the market majority when making decisions [16], [17]. However, previous research found that herding bias does not always significantly influence investment decisions [18], [19]. These inconsistent findings suggest that herding bias can hinder the optimization of investment returns, depending on the context and characteristics of investors. Furthermore, financial literacy plays a vital role in investment decision-making. Several previous studies indicated that financial literacy reflects an individual's ability to understand fundamental financial concepts and assess risks, thereby contributing to

overall financial well-being [20], [21]. Therefore, it is not surprising that the level of individual financial literacy determines the quality of their investment decision-making. Overall, although empirical evidence exists regarding the influence of overconfidence bias, herding bias, and financial literacy on investment decisions, these findings remain varied and context dependent [13], [22], [23], [24], [25], [26], [27], [28], [29]. Several other studies have shown contradictory results [30], [31], [32], [33], [34], [35]. Therefore, risk perception needs to be considered as a mediating variable to explain these psychological relationships more comprehensively [36], considering that risk perception can influence how investors respond to market uncertainty.

Risk perception is one of the important factors that influences investors' investment decisions [37]. This perception is subjective, formed from an individual's assessment of the level of uncertainty and control over a particular situation [38], [39]. In the context of behavioral finance, cognitive biases such as overconfidence and herd behavior have been shown to influence how investors perceive risk. Investors who experience overconfidence bias tend to assess risk too optimistically due to previous success or because they overestimate their ability to understand uncertain situations [40], [41]. As a result, investors often make irrational investment decisions. Meanwhile, herding behavior—or the tendency to follow the actions of other investors—also influences risk perception and decision-making, particularly in the context of institutional investors [42], [43]. Building on this phenomenon, the present study aims to analyze the influence of financial literacy, overconfidence, and herding bias on investment decisions, with risk perception serving as a mediating variable. The findings are expected to contribute to the advancement of behavioral finance research, particularly in understanding the role of risk perception in investment decision-making amid the dynamic nature of financial markets.

2. LITERATURE REVIEW

2.1 *Overconfidence, Risk Perception, and Investment Decision*

Overconfidence is a type of heuristic bias that refers to an investor's excessive self-confidence in their own abilities or judgments [14]. In certain contexts, overconfident investors may indirectly generate lower returns than those who approach investment decisions more rationally [44]. This is due to investors' excessive belief in their own abilities and knowledge, which can lead them to underestimate the risks involved. Prior studies have also highlighted that overconfidence has a significant impact on investment decisions and performance [45], [46]. Other research has also emphasized that the influence of behavioral biases, especially overconfidence bias, plays a significant role in shaping investment decisions [47], [48].

Apart from overconfidence, investment decisions can also be influenced by risk perception. Risk perception emerges when individuals demonstrate a high level of optimism that certain actions or events will result in favorable outcomes [10], [49]. Optimistic investors are more likely to choose risky assets over risk-free alternatives. They often exhibit overconfidence and a strong preference for engaging in high-risk investments [50]. Moreover, previous research suggests that individuals with a relatively high tendency toward confidence also exhibit a relatively high level of financial risk tolerance [51]. Consequently, they are more likely to make high-risk investment decisions, which may adversely impact their investment performance. Based on this rationale, the hypothesis of this study is:

H1: Overconfidence behavior has a significant influence on investment decision.

H2: Overconfidence has a significant influence on risk perception.

H3: Risk perception has a significant influence on investment decision.

H4: Risk perception mediates the influence of overconfidence on investment decision.

2.2 *Herding Behavior, Risk Perception, and Investment Decision*

Herding behavior is a key concept within the field of behavioral finance. Behavioral finance itself is a discipline that examines human financial behavior in the modern era, representing a synthesis of behavioral patterns and cognitive factors that contribute to irrational financial decision-making [52]. Herding behavior, in particular, refers to a behavioral bias in which investors tend to follow the actions of the majority when making financial decisions [12], [25]. Previous studies have indicated that investors tend to base their decisions on the actions of others, suggesting that herding behavior significantly influences investment decision-making [14], [30], [53], [54], [55].

Herding behavior can arise from a heightened perception of risk regarding stock returns [56]. Such behavior may also be driven by investors' tendency toward risk aversion as a means to minimize the likelihood of financial losses [57], [58]. Thus, it is not surprising that some investors exhibit herding behavior due to their inability to face the potential downside of their investments. These investors often assume that following the majority's decisions will make their portfolios more secure. Prior research has identified a strong correlation between herding behavior and perceived risk [59], as well as between risk perception and investment decisions [50], [60]. Referring to the above explanation, the hypotheses of this study are as follows:

H5: Herding behavior has a significant influence on investment decision.

H6: Herding behavior has a significant influence on risk perception.

H7: Risk perception mediates the influence of herding behavior on investment decision.

2.3 *Financial Literacy, Risk Perception and Investment Decision*

Risk and return are two interrelated things, which can be likened to two sides of a coin that are inseparable from each other, where both also have an important role in business growth. Business and financial risks are assumed to increase rapidly given the instability of the prevailing economic system

[61]. Lack of availability of market information will have an impact on increasing perceived risk and reducing accuracy in investment decision-making [62]. Lim et al. (2018) in their research also explained that risk perception has an important role in developing new capabilities to achieve optimal investment results [63]. Therefore, knowledge and availability of information play an important role in the accuracy of investment and financial risk assessments, which in turn will have an impact on investment performance in investment decision making.

The results of Canikli's (2019) research also found that risk perception can be explained by personality and advanced financial literacy [42]. Actual financial knowledge in the decision-making process, provided that financial knowledge is possessed, triggers positive changes in the decision maker's perception [63]. This condition occurs when an individual has a high level of financial literacy, then indirectly affects the level of perception or risk assessment of the individual from each decision-making process made, because the individual feels confident with the knowledge and abilities they have. However, in certain conditions, a high level of financial literacy can make business actors worry about the decisions they make. This is because too much information or knowledge obtained has an impact on more accurate risk assessments, but business actors are too afraid to make decisions because there are too many considerations of the impact of the risk. Several previous research results also show that there is a relationship between advanced financial literacy and personality with risk perception [42]; risk perception mediates the relationship between financial knowledge and behavioral intention [63]; risk perception moderates the relationship between financial literacy and investment decisions [62]. Thus, the hypothesis in this study is:

H8: Financial Literacy has a significant effect on Investment Decisions

H9: Financial literacy has a significant effect on Risk Perception

H10: Financial literacy has a significant effect on investment decisions through risk perception

3. METHODS

This study uses a quantitative approach to analyze the influence of financial literacy, overconfidence, herding behavior, and risk perception on investment decisions of Generation Z investors in East Java who participate in the capital market. Since the exact population is unknown, it is categorized as an infinite population [64]. The number of samples used was 360 respondents, referring to the approach proposed by Hair [65] which suggests the minimum number of samples is ten times the number of indicators in the model.

The selection of respondents was done by purposive sampling, which is a non-probabilistic technique in which only individuals who have become investors and have bought shares at least twice are used as research samples. Data collection was carried out using a 5-point Likert scale questionnaire, and secondary data were obtained from supporting literature. The data analysis technique used was Structural Equation Modeling–Partial Least Squares (SEM-PLS) with the help of SmartPLS 3.3.3 software.

Measurement Variable

a. Investment Decision

Investment decision is an investment decision made by individuals based on consideration of analysis results, investment objectives, and investment risks that have been made. The indicators used in this study were adopted from previous studies [66] i.e. comparison of investment return and risk levels, evaluation of investment performance.

b. Overconfidence

Overconfidence is a behavioral bias that occurs when investors tend to feel too confident about their skills, expertise, and intelligence. The indicators used to measure overconfidence are adopted from previous research [67] i.e., excessive trust controls uncertainty.

c. Herding Behavior

Herding behavior refers to a form of individual behavioral bias in which investors tend to follow and imitate the investment decisions of others or groups, rather than making independent decisions based on their own information. The indicators used to measure herding behavior in this study are derived from prior studies [45], [68] i.e. following the buy or sell decisions of other investors; selecting stocks based on the preferences of others; making stock choices influenced by the trading volume of other investors; and the rapidity with which herding behavior is exhibited.

d. Risk Perception

Risk perception is defined as an individual's evaluation of financial risks and the degree of uncertainty associated with those risks. The indicators for the risk perception variable are adapted from prior research and include risk understanding,

portfolio diversification, and the relationship between return and risk [37].

e. Financial Literacy

Financial literacy is the ability possessed by individuals encompassing knowledge and behaviors related to financial products and financial management. The indicators employed in this study are adapted from prior research and tailored to the field context, including debt management literacy, budgeting literacy, and financial services literacy [69], [70].

4. RESULTS AND DISCUSSION

4.1 Characteristics Respondents

The analysis of respondent characteristics was conducted to support the research findings, based on a sample of 360 participants. The characteristics considered in the analysis included gender, age, level of education, and occupation.

Table 1 Respondent Characteristics

Personal Demography	Indicator	Frequency	Procentage (%)
Gender	Male	266	73.89
	Female	94	26.11
Total		360	100
Age	18 th s/d 22 th	272	75.56
	> 22 th s/d 26 th	88	24.44
Total		360	100
Education Level	Elementary	0	0.00
	Junior High School	0	0.00
	Senior High School	170	47.22
	Undergraduate	190	52.78
Total		360	100
Firm Size	Student	284	78.89
	Entrepreneurship	64	17.78
	Government Civil Servant	12	3.33
Total		360	100.00

Source: (Primary Data, 2024-2025)

The results of this study indicate that the majority of respondents were male, accounting for 73.89% (266 respondents), with the dominant age group ranging from 18 to 22 years old, representing 75.56% (272 respondents). This suggests that most respondents belong to the younger Generation Z category, who are typically experimental in nature and tend to explore various types of investments and new strategies. The highest level of education was

predominantly at the Diploma/Bachelor level, comprising 52.78% (190 respondents), which may be due to their better understanding of investment concepts, risk analysis, and more advanced strategies. In terms of occupation, the majority of respondents were students, accounting for 78.89% (284 respondents), indicating that Generation Z students are showing interest in investing as part of their future planning after graduation.

4.1.2 Evaluation Model

The initial step in model evaluation involved testing the validity and reliability of the measurement items associated with the latent variables. Validity was assessed through factor loading values, where indicators are considered valid if the loading factor ranges between 0.60 and 0.70. For constructs with less established theoretical

support, a loading factor of 0.50 may still be deemed acceptable [71]. Another approach also suggests that loading values above 0.60 but below 0.70 may still be considered acceptable, on the condition that other indicators within the construct have loading values of at least 0.70 [72], [73].

Table 2 Validity and Reability

Variabel Laten	Items	Outer Loading	Cronbach Alpha	AVE	CR	Keterangan
<i>Financial Literacy</i>	X3.FL.3	0.728	0.643	0.570	0.796	Valid
	X3.FL.4	0.881				
	X3.FL.8	0.634				
<i>Herding Behavior</i>	X2.1	0.838	0.937	0.762	0.951	Valid
	X2.2	0.876				
	X2.3	0.881				
	X2.4	0.880				
	X2.5	0.855				
	X2.6	0.907				
<i>Overconfidence</i>	X1.1	0.886	0.975	0.787	0.978	Valid
	X1.10	0.910				
	X1.11	0.882				
	X1.12	0.956				
	X1.2	0.777				
	X1.3	0.924				
	X1.4	0.918				
	X1.5	0.828				
	X1.6	0.908				
	X1.7	0.844				
	X1.8	0.828				
<i>Risk Perception</i>	X1.9	0.964	0.955	0.820	0.965	Valid
	Z1.1	0.951				
	Z1.2	0.787				
	Z1.3	0.943				
	Z1.4	0.858				
	Z1.5	0.943				
<i>Investment Decision</i>	Z1.6	0.941	0.950	0.870	0.964	Valid
	Y1.1	0.905				
	Y1.2	0.949				
	Y1.3	0.937				
	Y1.4	0.939				

Source: Prepared by author, 2024-2025

Outer model testing was performed to confirm the validity and reliability of the measurement instrument. Items with factor loadings below 0.60 were eliminated, following the recommendations of prior research [72], [74]. Following the elimination process, 31 of the 33 items were found to be valid, having met the required threshold. Convergent validity was also confirmed, as all

constructs exhibited Average Variance Extracted (AVE) values exceeding 0.50 [75], [76]. Reliability was assessed through composite reliability and Cronbach's alpha, with all values surpassing the minimum required thresholds of 0.70 and 0.60, respectively [75], thus, all constructs in this study were deemed to be reliable.

The next step involves testing the inner model. Inner model analysis refers to the structural modeling approach employed to predict and evaluate causal relationships among latent constructs [75]. Evaluation of the inner model can be conducted through three parameters, including the coefficient of determination (R^2) and predictive relevance (Q^2). The results reveal that the R^2 value for Investment Decision is 0.853, indicating that Financial Behavior, Herding Behavior, and Overconfidence Bias collectively explain 85.3% of the variance in Investment Decision. The remaining 14.7% is attributed to other variables not examined in this study. Meanwhile, the R^2 value for Risk Perception is 0.965, suggesting that the same predictors account for 96.5% of the variance in Risk

Perception, with the remaining 3.5% explained by other external variables.

The Q-Square predictive relevance (Q^2) statistic is used to evaluate how well the research model and its parameters are able to predict the observed data [75]. A research model is deemed to have predictive relevance when the Q-Square predictive relevance (Q^2) value is greater than zero ($Q^2 > 0$). On the other hand, if the Q^2 value is less than zero ($Q^2 < 0$), it indicates that the model and its parameters lack predictive relevance [72]. Based on the calculation results, the Q-Square predictive relevance (Q^2) value is 0.994, equivalent to 99.4%. This indicates that the research model can explain 99.4% of the observed information within the scope of this study.

4.1.3 Hypothesis Testing

Table 3. Hypothesis Testing Results

	Hipotesis	Coefficient	Std Dev	P Values	Decision
H1	Overconfidence Bias -> Investment Decision	0.030	0.056	0.588	Ditolak
H2	Overconfidence Bias -> Risk Perception	-0.336	0.065	0.000	Diterima
H3	Risk Perception -> Investment Decision	0.857	0.134	0.000	Diterima
H4	Overconfidence Bias -> Risk Perception -> Investment Decision	-0.288	0.072	0.000	Diterima
H5	Herding Behavior -> Investment Decision	0.095	0.126	0.451	Ditolak
H6	Herding Behavior -> Risk Perception	0.656	0.064	0.000	Diterima
H7	Herding Behavior -> Risk Perception -> Investment Decision	0.562	0.103	0.000	Diterima
H8	Financial Literacy -> Investment Decision	-0.024	0.021	0.241	Ditolak
H9	Financial Literacy -> Risk Perception	-0.008	0.011	0.450	Ditolak
H10	Financial Literacy -> Risk Perception -> Investment Decision	-0.007	0.010	0.455	Ditolak

Source: Processed by Author (2025)

Based on the path analysis results, it was found that overconfidence bias does not significantly influence investment decisions ($p = 0.588$), but it does significantly affect risk perception ($p = 0.000$) with a negative direction. Therefore, H1 is rejected, and H2 is accepted. Meanwhile, risk perception is proven to have a significant positive effect on

investment decisions ($p = 0.000$), thus H3 is accepted. In addition, herding behavior was found to have no significant effect on investment decisions ($p = 0.451$), but it significantly influences risk perception ($p = 0.000$) in a positive direction, leading to the rejection of H5 and acceptance of H6.

The study also shows that financial literacy does not have a significant influence

on either investment decisions ($p = 0.241$) or risk perception ($p = 0.450$), with both relationships showing a negative direction, thus H8 and H9 are rejected. Furthermore, the findings indicate that risk perception serves as a full mediator in the relationship between overconfidence and investment decisions (H4), as well as between herding behavior and investment decisions (H7), with both hypotheses being accepted (H4: $p = 0.000$; H7: $p = 0.000$). However, risk perception does not mediate the relationship between financial literacy and investment decisions (H10), and thus H10 is rejected ($p = 0.455$). Accordingly, the findings affirm that risk perception serves as a crucial psychological mediating variable, channeling the effects of behavioral biases—specifically herding behavior and overconfidence bias—on investment decisions. However, this mediating role does not apply in the context of financial literacy.

DISCUSSION

The results of the study, conducted using a statistical approach, indicate that financial literacy does not have a significant effect on stock investment decisions among Generation Z investors in East Java. The majority of respondents in this study were aged between 18 and 22 years and were still active university students. This condition suggests that their financial priorities are more focused on daily needs, educational expenses, or recreational opportunities, making investment a lower priority. Income instability and limited understanding of basic financial concepts further explain why financial literacy has not yet become a relevant factor in influencing their stock investment decisions. In fact, statistical testing revealed a negative direction in the influence of financial literacy on investment decisions, indicating that higher financial literacy may actually discourage them from making investment decisions. This could be attributed to increased awareness of financial risks, including the potential of falling into high-interest debt, which fosters a more cautious or even risk-averse attitude toward investing. Furthermore, financial literacy was also found to have no significant influence on risk

perception among Generation Z investors. Nevertheless, investors in this group tend to exhibit a high level of risk perception, particularly concerning the potential loss of capital in stock investments. Their limited understanding of investment mechanisms leads to doubts about the suitability of stock investments in achieving their financial goals. The negative direction revealed by the statistical test indicates that lower financial literacy tends to increase risk perception, as fear of losses becomes more prominent due to their lack of confidence in understanding the selected investment instruments.

This study also found that herding behavior does not influence stock investment decisions among Generation Z in East Java. Most of the respondents were university students pursuing undergraduate degrees, who tend to analyze and verify information before making decisions. This suggests that their investment decisions are relatively rational and not merely driven by the actions of the majority of other investors. Nevertheless, the positive direction found in the influence of herding behavior on investment decisions indicates that when herding behavior does occur, there is a tendency to follow market trends. Conversely, a low level of herding behavior reflects an independent attitude in investment decision-making. Although herding behavior does not significantly affect investment decisions, it was found to have a significant influence on risk perception. Generation Z investors who tend to follow the actions of the majority exhibit risk perceptions that fluctuate depending on the market information they follow. This influence is positive, meaning that herding bias may improve risk perception if the information followed is positive, and worsen it if the information is negative. These findings are supported by previous research [77], [78] which states that herding behavior is often driven by investors' desire to avoid risk, leading them to follow the majority in order to minimize the potential for loss. Previous studies have also shown that herding behavior significantly influences risk perception, particularly in the context of highly uncertain stock markets [53].

In terms of overconfidence bias, the test results show that this bias does not influence investment decisions among Generation Z investors. This can be attributed to the characteristics of the respondents, who are relatively young and exhibit hesitation in making investment decisions due to their awareness of limited experience and knowledge. As a result, they tend to be more cautious when making investment decisions, particularly in stock investments. However, the positive direction of the influence of overconfidence bias on investment decisions indicates that when this bias increases, investors may become excessively confident, which can lead to losses due to misjudging investment opportunities. Conversely, a decrease in overconfidence bias contributes to more careful and well-planned investment decision-making. Meanwhile, overconfidence bias was found to have a significant effect on the risk perception of Generation Z investors. Overconfident investors tend to have a distorted perception of risk, as they overestimate potential gains and underestimate potential losses. These findings are reinforced by Assad (2020) and Chaudhary (2025), who argue that overconfidence bias causes investors to become excessively optimistic about their capabilities, which in turn diminishes their vigilance toward risk [50], [79]. Statistical test results indicate a negative relationship, suggesting that as the level of overconfidence increases, risk perception deteriorates, and conversely, lower overconfidence is associated with improved risk perception.

Furthermore, the study results show that risk perception has a significant influence on investment decisions. Generation Z investors tend to consider risk perception in their investment decision-making process. In this study, risk perception includes understanding of risk, portfolio diversification strategies, and comprehension of the relationship between return and risk. These findings are in line with prospect theory, which states that investment decisions are strongly influenced by subjective perceptions of risk. Investors with high-risk perception tend to make more conservative

decisions and place greater emphasis on the importance of diversification and risk management. Based on these results, it can be concluded that risk perception does not mediate the relationship between financial literacy and investment decisions. This is due to the absence of a direct effect of financial literacy on risk perception, despite the significant influence of risk perception on investment decisions. This condition indicates that financial literacy, either directly or indirectly, does not significantly influence stock investment decisions among Generation Z in East Java, and therefore does not function as a mediating variable. On the other hand, risk perception is proven to fully mediate the influence of herding bias on investment decisions. This means that herding bias can only affect investment decisions through risk perception. The statistical results show significant effects from herding bias on risk perception and from risk perception on investment decisions, while no direct effect is found from herding bias on investment decisions, indicating the occurrence of full mediation. Similarly, risk perception fully mediates the influence of overconfidence bias on investment decisions. This finding indicates that although overconfidence bias does not directly affect investment decisions, it can have a significant impact when risk perception is included as a mediating variable. Thus, in the context of Generation Z investors, risk perception plays a crucial role in bridging the influence of psychological biases on investment decisions, whereas financial literacy has not yet emerged as a dominant factor in this process.

5. CONCLUSION

This study aims to analyze the influence of financial literacy, herding bias, and overconfidence bias on investment decisions, with risk perception as a mediating variable among Generation Z investors in East Java. The results indicate that financial literacy does not have a significant effect on either investment decisions or risk perception. This is attributed to the respondents' characteristics, as the majority are students

who do not yet have a stable income, resulting in their financial literacy being limited to daily needs and not extending to investment-related matters. Risk perception also fails to mediate the relationship between financial literacy and investment decisions, indicating the absence of a mediating effect.

In contrast, herding bias and overconfidence bias do not directly influence investment decisions, but both significantly affect risk perception, which in turn significantly influences investment decisions. Therefore, risk perception fully mediates the influence of herding bias and overconfidence bias on investment decisions. These findings suggest that psychological factors—particularly risk perception—play a more

dominant role in influencing investment decisions among Generation Z than rational factors such as financial literacy. Accordingly, financial education for young generations should not only focus on improving financial literacy but also emphasize risk understanding and the impact of psychological biases in investment decision-making.

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