The Risk Perception as a Mediator Between Herding and Overconfidence on Investment Decision by Gen Z in Indonesia

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ABSTRACT

Behavioral finance theory highlights how psychological factors can lead to poor investment decisions, which may threaten investors' trust in the stock market, discourage investments, and hinder economic growth. This study aims to examine how behavioral finance factors, particularly herding bias and overconfidence bias, influence investment decision on the Indonesia Stock Exchange through risk perception. The research was conducted using an online questionnaire distributed to 120 Gen Z stock investors and analyzed using PLS-SEM. The results show that herding and overconfidence biases have a significant positive influence on risk perception. Both herding and overconfidence biases have indirect positive influences on investment decision through risk perception. Although overconfidence bias and risk perception can directly affect investment decision, herding bias fails to do so. These findings highlight the importance of considering an individual's behavioral biases and risk perception, while policymakers should devise strategies to mitigate their impacts; so that investors can benefit from investing, which may eventually lead to the growth of the national economy.

Keywords: Behavioral Bias; Financial Psychology; Investment Intention; Perceived Risk; Young Investor

INTRODUCTION

Indonesia presents a favorable environment for investors who pursue prospective returns. The capital market in Indonesia has experienced significant growth, rendering it an attractive investment destination for both domestic and international investors. According to the observed patterns from the KSEI (2023), there has been a substantial rise in the population of individuals engaged in stock investment. Specifically, capital market investors have experienced a significant increase of 194.3 percent since 2020, increasing from 3,880,753 to 11,420,074 as of July 2023. However, according to Harsono (2019), Indonesia lags behind its neighboring countries in terms of the ratio of investors in capital markets to the entire population, with Singapore at 26 and Malaysia at 7.8. Moreover, based on data released by the Indonesian Central Securities Depository (KSEI,

2023), foreign investors maintain a significant majority in terms of total share assets in Indonesia, even though it is evident that the capital market has witnessed consistent growth in the number of investors over the years.

The growing enthusiasm of young individuals towards investment has played a substantial role in Indonesia. This is evident from the dominance of stock investors under 30, namely those belonging to the generational cohorts of Generation Z (Gen Z) and millennials, within the overall population of capital market investors. According to data from the KSEI (2023), over 46 years from the reopening of the capital market, 57.26% of investors were below 30 years of age in July 2023. The increase in investors under 30 years of age from 2020 to 2023 is shown in Figure 1. However, it is noteworthy that a mere 2 percent of the Indonesian population, which amounts to 277,861,527 individuals according to Worldometer (2023), engaged in investment activities in the capital market during the previous year.

Figure 1. Number of Investors Under 30 Years Old in 2020 – 2023
Source: KSEI (2023)

Stock investment decisions are often influenced by recommendations from individuals with significant social media following, also known as herding behavior. Kumar and Goyal (2015) investigate the return matrix associated with stock recommendations provided by influencers, focusing on certain holding periods. A total of 171 stock recommendations were examined, encompassing 107 stocks listed on the Indonesia Stock Exchange (IHSG), throughout the period spanning from the beginning of 2022 to November 2022. Based on the findings of the study, the advice provided by investors failed to produce any statistically significant improvement in the overall worth of the investor's portfolio. Further, the presence of an overconfidence bias has the potential to negatively impact investing outcomes, as individuals tend to overestimate their level of knowledge and hence disregard important market information (Sabir et al. 2019). This inclination towards overestimation can result in inaccurate judgments and decision-making processes. Gen Zers must also understand the risks and returns associated with each saving and investment option (IDN Research Institute, 2023). One of the riskiest investment options is to buy stocks because there is no assurance of financial success (Adil et al., 2022). To mitigate the possible risks, it is essential for everyone to thoroughly

grow their competencies to survive in a constantly changing market (Edward & Kaban, 2021).

The impact of generations on distinctive investing styles has been largely disregarded by financial psychologists. The idea that generational influences might cause irrationality has been challenged by research, particularly when it comes to Gen Z. Behavioral researchers have proposed investor cohorts using a variety of group-based views, but there are few attempts to describe investors as generational groups. The behavioral biases of the Gen Z age are rarely examined in research that has attempted to examine the patterns and biases among investor generations (Abul, 2019). Therefore, this study intends to fill this gap and provide novelty by understanding the behavioral biases, i.e. herding bias and overconfidence bias, in investment decisions among Gen Z in Indonesia through risk perception.

There are seven research questions raised in this study: (1) Is investment decision positively influenced by the herding bias of Indonesia's Gen Z investors? (2) Is investment decision positively influenced by the overconfidence bias of Indonesia's Gen Z investors? (3) Is investment decision positively influenced by the risk perception of Indonesia's Gen Z investors? (4) Is risk perception positively influenced by the herding bias of Indonesia's Gen Z investors? (5) Is investment decision influenced by the herding bias through risk perception? (6) Is risk perception positively influenced by the overconfidence bias of Indonesia's Gen Z investors? (7) Is investment decision influenced by the overconfidence bias through risk perception?

This study serves several contributions. First, it expands the existing literature on financial behavior and investment by examining the relationship between behavioral bias and investment decisions. Next, it provides insights into both theory and concrete evidence that may be utilized as reference material for information, discussions, and future research on issues concerning Indonesian investors. Furthermore, the results of this study can help develop strategies and interventions to improve the financial security of Gen Z investors and the overall stability of financial markets by assisting them in making more logical and informed investment decisions. Finally, this study provides practical insights for investors, policymakers, and the government in determining the factors that influence Gen Z's investment decisions in the Indonesia Stock Exchange.

LITERATURE REVIEW

Financial Behavior

Behavioral finance has grown significantly in recent decades, contributing valuable insights into investor behavior and enhancing the existing body of finance literature (Madaan & Singh, 2019). The area of finance is currently engaged in an extensive initiative to better understand investors' economic decisions, drawing on perspectives from behavioral, cognitive psychology, and traditional decision-making (Kumar & Goyal,

2016). Furthermore, behavioral finance examines the influence of psychological variables on stock market dynamics. Recent studies in the field of behavioral finance have provided compelling evidence against the commonly held beliefs in traditional finance (Jaiyeoba, 2020). By employing the psychological framework of human behavior to analyze financial markets and using it as a means of comprehending investor choices, the comprehension of the conduct exhibited by irrational investors can be enhanced.

Construct Definitions

Herding behavior refers to a behavior in which an investor imitates the actions of another investment driven by a variety of causes and specific situations (Wibowo et al., 2023). Many investors may exhibit a delayed response to new information instead of relying on the trading actions of those believed to possess a higher level of expertise.

Overconfidence has garnered significant attention from researchers in the financial industry as an essential component of behavioral bias. Overconfidence is defined as investors believing their knowledge to be more accurate than it was and that they could see the future better than others (Sabir et al., 2019). Individuals afflicted with overconfidence bias tend to overestimate their capabilities, reasoning ability, and accuracy of the information they possess, leading them to falsely estimate the potential risks associated with achieving their goals.

Studies have defined risk perception as individuals' views of an occurrence that has the potential to result in unfavorable outcomes. Risk perception refers to the cognitive process by which individuals assess and comprehend the degree of uncertainty and potential for negative outcomes linked to particular behaviors (Wibowo et al., 2023).

Investment decision refers to the skillful management of challenging circumstances encountered during the investment process (Ahmad, 2021). Investment decisions involve a combination of existing assets and prospective investment opportunities that yield a favorable net present value. Investment decisions aim to deliberate on the selection of assets intended to generate income (Jain, 2020) and realize future financial gains (Raut et al., 2018).

Hypothesis Development

Herding Bias and Investment Decision

Herding is a psychological factor that influences investor's decisions. This occurs when sensible people begin to act irrationally by relying on the opinions of others while making financial decisions. According to Kartini and Nahda (2021), investors in Indonesia abandon their own investment decisions during panics and instead choose to follow other investors because they believe that others have more knowledge about how the market would act.

H1: Investment decision is positively influenced by the herding bias of Indonesia's Gen Z investors

Overconfidence Bias and Investment Decision

Overconfidence bias is one of the most important factors affecting individual stock investors' choices. Kartini and Nahda (2021) reveal that overconfidence among investors results in irrational decision-making, ultimately leading to subpar performance. Consequently, the research suggests that individuals who exhibit overconfidence tendencies frequently experience significant financial costs and losses.

H2: Investment decision is positively influenced by the overconfidence bias of Indonesia's Gen Z investors

Risk Perception and Investment Decision

Risk perception in investment decisions includes the perspectives, evaluations, and understanding of investors regarding the potential dangers linked to a particular investment instrument. According to the study, investors engage in the process of evaluating potential risks that may arise in the future and exhibit a sense of assurance in their investment choices (Ahmed et al., 2022).

H3: Investment decision is positively influenced by the risk perception of Indonesia's Gen Z investors

Risk Perception as the Mediator

When making financial decisions, many investors have a propensity to follow the herd or overconfidence biases. Herding behavior results from the influence of risk perception on stock returns, as suggested by Almansour et al. (2023), and is supported by Wibowo et al. (2023) who stated that herding bias develops because of how much risk investors perceive from stock returns. Moreover, Almansour et al. (2023) state that investors with overconfidence tend to possess a positive view of risk and demonstrate a greater propensity to embrace a risky approach when making investment decisions.

H4: Risk perception is positively influenced by the herding bias of Indonesia's Gen Z investors

H5: Investment decision is influenced by the herding bias mediated by risk perception

H6: Risk perception is positively influenced by the overconfidence bias of Indonesia's Gen Z investors

H7: Investment decision is influenced by the overconfidence bias mediated by risk perception

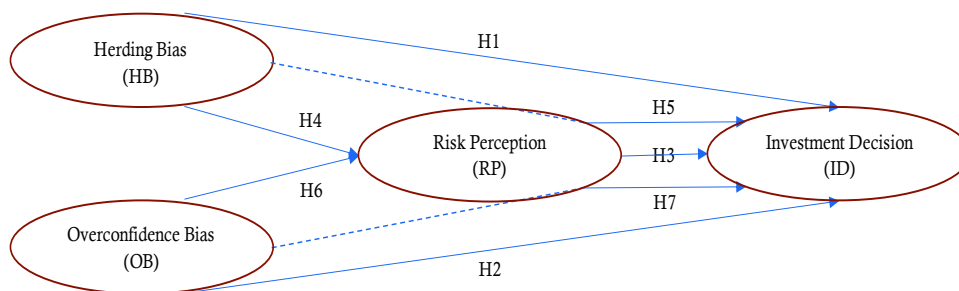The proposed hypothesis is illustrated by the research model shown in Figure 2.

Figure 2. Research Model

METHODOLOGY

This study used data gathered through a set of questionnaires distributed to the participants based on the planned sample characteristics. The Google Forms application served as a tool for tracking the data. Once participants finished and submitted the questionnaires, a screening and sorting procedure was implemented to identify and choose those that had been accurately completed following the instructions provided. The data obtained were collated and thoroughly analyzed using PLS-SEM analysis. A total of 120 respondents were collected in October 2023. The respondents were individuals aged between 17-26 years old and had invested in the Indonesia Stock Exchange. Investors' characteristics were determined by gender and the duration of their investments within the Indonesia Stock Exchange. A total of 126 individuals agreed to complete the questionnaires. However, six did not meet the specified requirements, resulting in a final sample size of 120 responses for analysis.

The respondents' demographic characteristics are presented in Table 1. There were 77 males and 43 females participated in the survey. The respondents were aged between 17 and 26 years, under Generation Z's age group. 84 individuals had invested for less than three years, and 36 individuals had invested for more than three years on the Indonesia Stock Exchange.

Table 1. Characteristics of Respondents

Description		Frequency	Percent
Gender	Male	77	64.2
	Female	43	35.8
Age (years)	17 - 26	120	100
Investment duration (years)	< 1	22	18.4
	1 - 2	34	28.4
	2 - 3	28	23.3
	3 - 4	14	11.6
	4 - 5	15	12.5
	> 5	7	5.8

All the constructs employed in this study were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). There were five items to measure the first independent variable, which was Herding Bias, taken from Baker et al. (2019) including statements such as "Other investors' decisions of buying and selling stocks affect my investment decisions" and "I usually react quickly to the changes in other investors' decisions and follow their reactions to the stock market". The second independent variable, Overconfidence Bias, was measured using seven items from Mumaraki and Nasieku (2016) including statements such as "I feel that I am always lucky to invest in the best deals" and "I believe that my skills and knowledge of the stock market can help me to outperform the market". Risk Perception was measured using four items adapted from Hossain and Siddiqua (2022), which contained statements such as "I am careful about stocks that show unexpected fluctuations in price or transaction" and "I generally have concerns about investing in stocks with a historical adverse performance in trading". Finally, there were five items to measure the dependent variable, which was Investment Decision taken from Halim and Pamungkas (2023). The statements used include "My investment decisions support my investment goals" and "I usually get what I expect from my investment decisions". To evaluate the questionnaire's validity and reliability, a pre-test was conducted with 30 participants who were not part of the survey population.

This study examined the relationships between latent constructs in the research model using the Partial Least Squares Structural Equations Modeling approach. There were two stages involved, i.e. evaluating the measurement model and structural model (Hair et al., 2019). The measurement model was examined by testing the validity and reliability, while the structural model was examined through tests of R^2, f^2, Q^2, path coefficients, and indirect effects.

RESULTS

Measurement Model

The purpose of the initial validity and reliability testing was to determine the degree of accuracy and consistency. The composite reliability (CR) value serves as the foundation for evaluating internal consistency reliability. When the reliability value falls between 0.70 and 0.90, it is deemed satisfactory to good (Hair et al., 2019). The study's CR values were discovered to range from 0.745 to 0.882.

According to the test results, the average variance extracted (AVE) value for each variable was above the threshold of 0.5, which is necessary for convergent validity (Hair et al., 2022). An adequate degree of internal consistency and accuracy is demonstrated in Table 2 for the values of CR and AVE, which signify the fulfillment of the reliability and validity constructs.

Finally, to ensure that every construct in the research model is unique from the other variables, it is critical to evaluate the discriminant validity of the reflective measurement

model. This study measured the similarity across constructs using the heterotrait-monotrait (HTMT) evaluation, where the value should be less than 0.90 (Henseler et al., 2015). Table 3 indicates that the obtained findings were below the threshold value, indicating that discriminant validity had been established and that the reflective variables were distinct from one another.

Table 2. CR and AVE Value

Construct	Item	CR	AVE
Herding Bias (HB)	HB1 HB2 HB3 HB5	0.822	0.536
Overconfidence Bias (OB)	OB1 OB2 OB3 OB4 OB5 OB6 OB7	0.882	0.522
Risk Perception (RP)	RP1 RP2 RP4	0.745	0.502
Investment Decision (ID)	ID1 ID2 ID3 ID4 ID5	0.853	0.538

Table 3. HTMT Ratio

Construct	1. HB	2. OB	3. RP	4. ID
1. Herding Bias				
2. Overconfidence Bias	0.365			
3. Risk Perception	0.608	0.723		
4. Investment Decision	0.323	0.682	0.796	

Structural Model

For the inner model, it is crucial to test the variance inflation factor (VIF) with a value less than three to determine the collinearity before evaluating the structural model. According to Becker et al. (2013), a greater VIF score suggests that there might be an issue with the collinearity of the variables. Table 4 demonstrates that the study did not have a collinearity problem because the inner VIF values were found to be below the predetermined limit.

Table 4. Collinearity Statistics

Construct	1. HB	2. OB	3. RP	4. ID
1. Herding Bias			1.080	1.165
2. Overconfidence Bias			1.080	1.373
3. Risk Perception				1.464
4. Investment Decision				

To assess the significance of items, direct effects, and indirect effects in the structural model, a bootstrap technique with 5,000 iterations was employed. Hair et al. (2022) state that the coefficient of determination (R^2) value, effect size (f^2), and cross-validated redundancy (Q^2) are used to evaluate the model quality.

When the value is measured at 0.25, 0.50, and 0.75 correspondingly, R^2 is considered weak, moderate, and considerable (Hair et al., 2019). This study's R^2 values for Risk Perception and Investment Decision were 0.317, and 0.431, respectively, as shown in Table 5. This indicates that predictor constructs with weak to almost moderate criteria have an impact on the variables.

According to Hair et al. (2019), f^2 greater than 0.02, 0.15, and 0.35 generally indicate modest, medium, and large effect sizes. According to Table 5, when it came to the impact of Investment Decision, the largest effect size was discovered in Overconfidence Bias (0.219), followed by Risk Perception (0.127), and Herding Bias (0.002).

For every endogenous variable, the Q^2 values should ideally be larger than zero to demonstrate how well the structural model predicts the construct. Q^2 values larger than 0, 0.25, and 0.5 generally denote small, medium, and high predictive relevance for the PLS-path model (Hair et al., 2019). According to the study's findings, all Q^2 values fell into the small to medium predictive power range.

Table 5. Structural Model Evaluation

Relationship	R^2	R^2 Adjusted	Effect Size (f^2)	Predictive Relevance (Q^2)
Herding Bias				
HB -> RP			0.079	
HB -> ID			0.002	
Overconfidence Bias				
OB -> RP			0.271	
OB -> ID			0.219	
Risk Perception	0.317	0.305		0.133
RP -> ID			0.127	
Investment Decision	0.431	0.416		0.206

Finally, a one-tailed test was used to explore each of the assumptions stated in this research. The results are shown in Table 6. All the hypotheses are supported except for

H1 where Investment Decision is not positively influenced by the Herding Bias (β = 0.032, t = 0.396). However, Investment Decision is found to be positively influenced by the Overconfidence Bias (β = 0.414, t = 4.536) and the Risk Perception (β = 0.325, t = 2.773), confirming H2 and H3 are justified. Risk Perception is also found to be positively influenced by the Herding Bias (β = 0.241, t = 2.948) and the Overconfidence Bias (β = 0.447, t = 6.833), which means H4 and H6 are accepted. Risk Perception is confirmed to mediate the relationship between Herding Bias and Investment Decision (β = 0.079, t = 1.781), as well as the relationship between Overconfidence Bias and Investment Decision (β = 0.146, t = 2.561) supporting H5 and H7. Figure 3 shows the relationship between the variables tested.

Table 6. Hypotheses Testing Results

Path	Direct Effect			Indirect Effect			Total Effect			Supported
	β	t-value	p-value	β	t-value	p-value	β	t-value	p-value	
H1. HB -> ID	.032	.396	.346				.110	1.296	.097	No
H2. OB -> ID **	.414	4.536	.000				.559	9.067	.000	Yes
H3. RP -> ID **	.325	2.773	.003				.325	2.773	.003	Yes
H4. HB -> RP **	.241	2.948	.002				.241	2.948	.002	Yes
H5. HB – RP – ID *				.079	1.781	.037				Yes
H6. OB -> RP **	.447	6.833	.000				.447	6.833	.000	Yes
H7. OB – RP – ID **				.146	2.561	.005				Yes

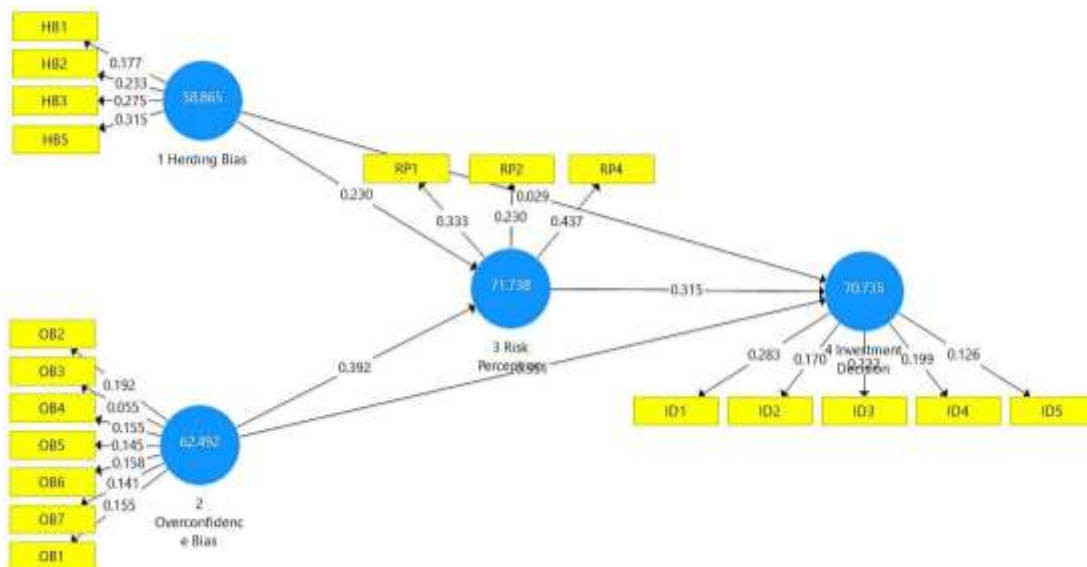*significant at p < 0.05
**significant at p < 0.01

Figure 3. Result Model

Importance-Performance Map Analysis

The relationship between each given attribute's significance and performance, as well as the difference between these attributes' actual results and expectations, are visualized using a technique known as Importance-Performance Map Analysis (IPMA) (Ringle & Sarstedt, 2016). The goal of IPMA is to identify the constructs that are low-performing but still reasonably significant for the target variable. Figure 4 illustrates the relatively high performance of all the variables utilized in this study to promote Investment Decision, with respective values for Herding Bias, Overconfidence Bias, and Risk Perception being 58.864, 62.492, and 71.738. Overconfidence Bias is the most important factor contributing to Investment Decision, yet it is not the highest performer compared to other antecedents.
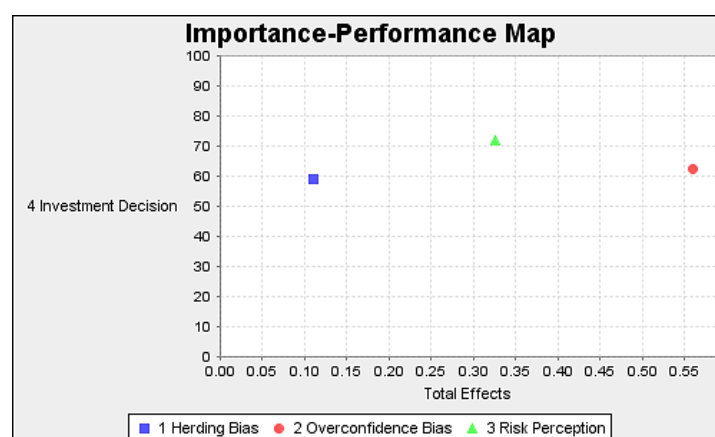

Figure 4. IPMA of Investment Decision

DISCUSSION

The results of this study complement earlier research showing that overconfidence bias and risk perception directly and positively affect investment decision (Ahmed et al., 2022; Kartini & Nahda, 2021). Herding bias and overconfidence bias are able to influence risk perception as found in the study by Wibowo et al. (2023). Moreover, risk perception functions as a mediator when herding bias and overconfidence bias influence investment decision, which strengthens the study by Almansour et al. (2023).

This study highlights the important role of overconfidence bias among Gen Z investors in Indonesia as it has a prominent influence on both risk perception and investment decision. The findings, however, show that investment decision is not affected directly by the herding bias; unless it is influenced through risk perception. Market participants, such as Gen Z investors, may follow herding behavior due to low-risk propensity and the perception that adversely affects their investment decisions (Ahmed et al., 2022). Thus, while herding bias itself does not directly impact investment decisions, it can influence them through its effect on risk perception.

This research, therefore, offers several implications for behavioral studies on young investors. Overconfidence can lead to excessive trading (Abideen et al., 2023), which results in poor investment decisions. Overconfident Gen Z members also tend to overlook relevant information that could help them make better decisions. Both herding and overconfidence biases can affect how young investors perceive risks (Weixiang et al., 2022), which can result in less-than-ideal investment decisions. Gen Z members may also underestimate the risks involved in their investments due to overconfidence bias, which could result in excessive risk-taking and possibly poor investment performance. To lessen the adverse effects of these biases, young investors can practice self-awareness, seek different viewpoints and advice (Vania & Kaban, 2022), inquire and reset their investment knowledge regularly, and think about utilizing a long-term plan to assist them in approaching financial decisions more carefully.

CONCLUSIONS

This study examines the determinants of investment decisions among Gen Z investors. It is then accomplished by testing the role of behavioral biases, which are herding and overconfidence biases, through risk perception. The proposed research model was tested and the results yielded three significant findings. First, the overconfidence bias plays a significant role, both directly and indirectly, in influencing investment decisions among Gen Z investors in Indonesia. Second, both herding and overconfidence biases are found to have significant effects on risk perception. Third, although herding bias fails to directly impact investment decisions, it can influence them through risk perception.

Finally, this study has a few limitations that present opportunities for further research. Future studies should address the issue of a small number of respondents by including more Gen Z participants from various cities in Indonesia. To investigate the roles of various predictors, mediators, and moderators in investment decisions, more research can test these hypotheses. Additionally, utilizing a range of measurements of the variables would strengthen the robustness of this study.

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