

The Psychology Behind the 'Buy' Button: The Role of Overconfidence, Neuroticism, and Sensation Seeking in Stock Investment Decisions in Batam City

Johney Budiman^{1*}, Isnaini Nuzula Agustin², Jessica Tania³

^{1,2,3} Batam International University, Indonesia

*Corresponding Author: johney.budiman@uib.ac.id

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ABSTRAK

The rapid growth of retail investors in Indonesia, dominated by Generation Z, reflects positive developments in the capital market. However, this is not always accompanied by rational investment decision. This phenomenon indicates the influence of behavioral and psychological factors in the investment decision-making process. This study aims to examine the influence of behavioral bias on investment decisions, with risk perception as a mediating variable. Using surveys, numerical research technique was used with an emphasis on freshly collected data. The study sample included 365 respondents from Generation Z and Millennials in Batam City, Riau Islands, who are actively involved in the capital market. Using Structural Equation Modeling-Partial Least Squares (SEM-PLS) assisted by SmartPLS software, data analysis was carried out. The results show that risk perception and sensation seeking have a significant positive effect on investment decisions, with sensation seeking also having a significant effect on risk perception. Neuroticism has a significant negative effect on investment decisions but not on risk perception, while overconfidence is only significant on investment decisions. Mediation occurs only for sensation seeking. These findings highlight the importance of improving financial literacy and risk awareness to encourage more rational and sustainable investment decisions, especially among young investors.

INTRODUCTION

Indonesia has experienced significant investment market growth in recent years, with an increasing number of retail investors, dominated by millennials and Gen Z (Willie Kurnijanto *et al.*, 2025). The capital market plays a crucial role in economic development, especially in developing countries. The growth of retail investors in Indonesia actually exacerbates the problem of irrational investment decisions due to behavioral biases, where investors tend to be overconfident and underestimate risk, neuroticism increases excessive anxiety, and sensation seeking encourages impulsive risk-taking. This leads to significant financial losses and market volatility, especially among the younger generation, who

dominate participation (Leiwakabessy *et al.*., 2021). However, the increase in the number of investors is not always accompanied by rational and informed investment decision-making.

Many individual choices about how to invest are influenced by factors such as an investor's personality, the environment they find themselves in, their values, and their emotions (Haqqani *et al.*., 2025). The primary motivation for investors or the public to invest in the stock market is to achieve higher returns compared to investing in other financial instruments. The stock market offers profit opportunities in the form of dividends and capital gains.. Therefore, investors need to have the ability to process and analyze all available information before making investment decisions (Leiwakabessy *et al.*., 2021).

Since 2020, there has been a significant increase in the number of investors on the Indonesian stock exchange. In 2020, there were 3.8 million investors with Single Investor Identification (SID). This number increased dramatically in 2021, growing by 93%, or 3.6 million SIDs, bringing the total to 7.4 million SIDs. Then, in 2022, the number of investors increased by another 38%, or approximately 2.8 million SIDs, reaching 10.3 million SIDs. This increase continued in 2023, with a 17.9% increase, or 1.9 million SIDs, bringing the total to 12.1 million SIDs. In 2024, investors increased by another 22.2%, or approximately 2.7 million SIDs, to 14.8 million SIDs. To date, the number of SIDs has reached nearly 17 million, valued at approximately IDR 650.61 trillion. This situation indicates a growing public interest in digital assets as both an investment option and a means of transaction.

Furthermore, Indonesian stock market investors set a new record in July 2025, reaching a total of 17,016,329 SID. This result demonstrates that the addition of investors has exceeded the target of two million new investors. Compared to the 14,871,639 SID at the end of 2024, the number of capital market investors increased by 2,144,690 SID, or 11.42% (Bursa Efek Indonesia, 2025). The Indonesian Central Securities Depository (KSEI, 2025) reported that the number of investors on the Indonesian stock exchange has grown rapidly over the past year, jumping 17.44 percent, from 16.99 million to 17.46 million investors by July 2025. This figure demonstrates the public's enthusiasm for investing in the capital market. Developments in financial technology and ease of digital access have driven a significant increase in retail investor participation in Indonesia. According to OJK (2024) data, the number of investors in the capital market has doubled in the past five years. However, financial literacy remains a major challenge, and psychological biases still predominantly influence investment decisions (Yoga *et al.*., 2025).

The capital market in the Riau Islands Province (Kepri) continues to show a significant upward trend. According to data from the Financial Services Authority (OJK), the number of Single Investor Identification (SID) holders in the Riau Islands reached 483,909 as of December 2025, representing a 38.39 percent increase compared to the previous year. Over the past three years, the number of stock investors in the Riau Islands has continued to grow. In 2023, there were 308,557 investors, increasing to 349,666 investors in 2024, and then soaring to 483,909 investors in 2025.

He added that the OJK will continue to encourage expanded public access and understanding of safe and officially registered capital market products and services. Regionally, Batam City has the largest number of investors in the Riau Islands, with 334,801 SID holders."Batam's dominance as a center of economic growth in the Riau Islands has contributed to high public participation in the capital market. However, we also continue to

promote equitable financial literacy and inclusion across all regencies and cities," he explained (Fm, 2026).

This study employs three main theoretical foundations, namely the Theory of Planned Behavior (TPB), Prospect Theory, and Behavioral Finance Theory, to explain how personality characteristics influence investment decision. The Theory of Planned Behavior is also used as a foundation for understanding how attitudes and risk perception mediate the influence of personality on investment decisions. The Theory of Planned Behavior (Ajzen, 1991) is based on the principle that individuals' attitudes drive their behavior. Behavioral intentions are driven by perceived behavioral control, subjective norms, and attitudes. Therefore, the TPB helps understand and predict investor behavior in selecting their investment portfolios (Rajasekar *et al.*, 2023). Prospect Theory, developed by Kahneman and Tversky in 1979, provides a framework for understanding investment decisions under pressure. It explains that people evaluate outcomes based on a set of benchmarks, with loss aversion and framing impacts influencing their risk preferences. Research (Khezri *et al.*, 2023) concludes a causal relationship between elements of prospect theory, such as risk attitudes, personal judgment, overconfidence, and traders' decision-making, which is influenced by collective behavior, mindset, and emotional control.

Behavioral Finance Theory introduced by Thaler (1999) explains that investors decisions are influenced by psychological factors, cognitive biases, and emotional aspects, causing individuals to behave irrationally in financial decision making. . This theory emphasizes that behavioral factors play a significant role in financial and investment decisionmaking, particularly in stock trading. Behavioral biases can arise due to investors' limited ability to process and analyze information, potentially impacting the quality of investment decisions (Ahmed *et al.*, 2022). Investment decision is a policy or choice made by an investor to invest funds in one or more assets to achieve profitable returns in the future. Every individual who invests naturally desires to make the most ideal decision. Investment decisions are the result of a complex combination of financial and psychological factors (Jiang *et al.*, 2024).

Investment decisions are the process by which an investor chooses among various financial assets or investment opportunities under conditions of uncertainty, influenced by psychological, cognitive, and emotional factors, rather than solely based on rational analysis (Adiputra, 2021). The behavior of making investment decisions describes the process of making personal financial and investment-related decisions, which is influenced by a number of variables including financial knowledge, financial attitudes, financial behavior, self-control, psychological biases, and the outside environment (Nabilah *et al.*, 2025).

Investors might display excessive confidence, believing they have greater trading expertise than they actually possess, largely due to their past achievements. Individuals often make poor financial choices because they typically struggle to grasp financial principles (Gambetti *et al.*, 2022). Ramashar *et al.*, (2022) Investors choose among many investing alternatives based on the possible hazards and unpredictability connected with their investing activities. Individual who invest might display overconfidence, believing they have greater trading expertise than actually do, largely influenced by their past achievement (Karki *et al.*, 2024). Kumar *et al.*, (2024) highlighted sensation seeking as a predictor of aggressive investment behavior. However, (Almansour *et al.*, 2023) emphasized the need to examine risk perception as a mediating variable that simultaneously links psychological variables and

investment decisions. All these studies provide opportunities for integrative research using a mediation approach in the Indonesian market.

Research by Almansour *et al.* , (2023) shows that overconfidence is a key independent variable influencing risk perception, which then acts as a mediator in investment decisions. This means that investors with overconfidence (overconfidence bias) tend to believe they know more than they actually know, leading to inaccurate and low risk assessments. In the study by Nadhila *et al.* , (2024), the relationship between overconfidence and risk perception shows that both variables play important roles in influencing investment decisions, but in different directions. From a behavioral viewpoint, Ardini (2023) study explains the link between overconfidence and risk perception. Investors overconfidence makes them overestimate their understanding and information, therefore downplaying current dangers. Risk perception in this study serves as a moderating factor reflecting how investors evaluate risk using their knowledge and opinions. But the findings indicate that the link between overconfidence and investing decisions is not much attenuated by risk perception.

H₁: Overconfidence can significantly influence Risk Perception

Research on personality and investment decisions confirms that neuroticism is related to a more pessimistic/risk-averse attitude and significantly influences asset allocation (Jiang *et al.* , 2024). Pavlíček *et al.* , (2021) study found a weak but significant correlation between neuroticism and several indicators of risk attitudes (cross-country/sample research). In other words: neuroticism is indeed related to risk attitude or perception, statistically significant, but the effect tends to be small. A study that explains neuroticism is positively related to the level of fear of COVID-19 risk perception means that more neurotic individuals report higher risk perceptions towards COVID and anxiety symptoms, the effect is reported to be significant (Zhang & Fan, 2022). Although research related to risk perception towards COVID-19 we can assess that Neuroticism can influence risk perception Since individuals with elevated neurotic traits are more inclined to encounter unfavorable feelings like apprehension, fright, and tension, which makes them more sensitive to danger and tend to overestimate risks. Conversely, individuals with low levels of neuroticism will have lower risk perceptions because they are more emotionally stable.

H₂: Neuroticism can significantly influence Risk Perception

A study by Jiang *et al.* . (2023) found that the influence of sensation seeking on risk perception was lower (especially in men). This suggests that sensation seeking may be associated with lower (not always "higher") risk perception, depending on the context (insurance) and the moderator, gender. Alice *et al.* , (2021) study emphasized that sensation seeking is a "proneness bias," not just risk perception, so its relationship to perceived risk is sometimes not directly examined. The study found that sensation seeking is a proneness factor involved in all risk-taking domains. For risk perception itself, it is more discussed as a situational perception bias, but implicitly the trait of sensation seeking is associated with a tendency towards lower risk perception or higher risk tolerance.

H₃: Sensation Seeking can significantly influence Risk Perception

Numerous research efforts have indicated that the way risks are perceived greatly impacts investment choices. Research conducted by Yoga *et al.* , (2025) found that high risk perception encourages investors to be more conservative, with social media also influencing risk perception and investment behavior of young investors. Research on Generation Z investors in Indonesia by Willie Kurnijanto *et al.* , (2025) showed that risk perception

mediates the relationship between behavioral biases, such as overconfidence, herding, and loss aversion, and investment decisions. Similar findings are also supported by Daffa Rizky Ramadhianto *et al.*, (2025), and some have emphasized that increasing risk understanding through financial literacy and education can encourage more rational and informed investment decision-making (Togan *et al.*, 2025).

H₄: Risk Perception can significantly influence Investment Decision

Based on the article "The Influence of Overconfidence, Representative Bias, and Risk Tolerance in Investment Decision-Making: Evidence on Stock Investors in Indonesia" by (Adiputra, 2021), it was found that: With a t-statistic of 2.822 and a p-value of 0.005, overconfidence significantly affects investment decisions, suggesting a substantial positive impact. Investors with overconfidence tend to make investment decisions with high confidence that are sometimes risky, such as overtrading and ignoring risk. This study, using data from 230 stock investors in Indonesia and analyzed using Smart PLS 3.2.8, supports that overconfidence, as a psychological bias, significantly influences investment decision-making behavior. The study also suggests the importance of psychological bias control strategies to avoid repeated mistakes that can harm investors.

Cuandra and Setiawan (2025) also reported that overconfidence positively and significantly influences investment decisions among stock investors in Batam. Investors who possess higher confidence in their knowledge and investment abilities tend to rely on their own judgment when making investment choices, thereby increasing the likelihood of investment activity.

The study ul Abdin *et al.*, (2022) examined the determinants of overconfidence that impact investment performance through risk proportions and demonstrated a significant influence of overconfidence on investment behavior. According to an article by Willie Kurnijanto *et al.*, (2025), overconfidence behavioral bias has a significant positive influence on investment decisions among Generation Z investors in Indonesia. Young, overconfident investors perceive themselves as possessing sufficient knowledge and skills, thus tending to base their investment decisions on their personal opinions or analysis. Furthermore financial knowledge, acting as a mediating factor, enhances the effect of overconfidence on investment decision, indicating that greater financial understanding leads to a more pronounced effect of overconfidence on one's decision-making in investments. Additionally, overconfidence negatively affects investment decision in a significant manner, particularly among male respondents, who frequently make rash and irrational investment decisions that can negatively impact the Indonesian stock market (Budiman *et al.*, 2025).

Overconfidence encourages investors to overestimate their abilities, insight, and predictive accuracy, leading them to ignore or underestimate investment risks. Investors with high levels of overconfidence generally engage in excessive trading, fail to diversify their portfolios optimally, and pay little attention to objective market information. This condition ultimately has a negative impact on investment performance and increases the possibility of financial losses (Singh, Darmendra Malik, 2024).

H₅: Overconfidence can significantly influence Investment Decision

Based on research by Kevin *et al.*, (2023), neuroticism has a significant negative influence on investment decisions. Individuals with high levels of neuroticism tend to have a low risk tolerance and are more prone to anxiety and insecurity when facing complex financial situations, thus tending to avoid taking risks in investments. Consequently,

neuroticism can lead to a risk-averse attitude that negatively impacts investment decisions, particularly in the Indonesian capital market. This study concludes that neuroticism acts as a psychological factor influencing investment decisions, generally counterproductive to healthy and strategic risk-taking. Investors with high levels of neuroticism are more pessimistic about future stock returns, tend to anticipate higher market risks, and are more cautious in their portfolio allocation to risky assets. Neuroticism influences investment decisions through pessimism and fear of loss (Jiang *et al.*., 2024).

H₆: Neuroticism can significantly influence Investment Decision

Son and Jeong (2023) showed that individuals with high levels of sensation seeking have a significant tendency to engage in risky investment behavior, including stock addiction tendency. This study, which used a sample of investors in South Korea, found that the urge to seek sensations and new experiences makes individuals more inclined to make impulsive and high-risk investment decisions, especially in volatile market conditions. The effect of sensation seeking on this extreme investment tendency remains positive and significant, although it can be weakened by high levels of distress tolerance, namely an individual's ability to manage stress when facing losses. These results illustrate that sensation seeking indirectly influences investment decisions, where individuals with sensation-seeking traits tend to make more aggressive, risk-oriented investment decisions, often driven by emotions or the desire for short-term gratification from investment activities. Therefore, sensation seeking has not been proven to be a significant factor driving major investment decisions in Bitcoin, contrary to some initial assumptions that sensation seeking traits encourage high-risk investments (Müser *et al.*., 2024).

H₇: Sensation Seeking can significantly influence Investment Decision

Research by Arie Wibowo *et al.*., (2023) found that when investors are overconfident, they tend to underestimate risk (lower their risk perception). This low risk perception then encourages them to make more aggressive or speculative investment decisions. There is a significant effect of overconfidence on investment decisions, and this effect is mediated by risk perception; that is, overconfidence influences risk perception, which in turn influences investment decisions (Ferdinand, 2023).

A PubMed article (2025) by Haqqani *et al.*., (2025) states Neuroticism has a negative correlation with long-term investing decisions, and risk aversion, not risk perception, mediates the link between personality characteristics and investment intentions. Neuroticism negatively and significantly affects long-term investment plans, and this effect is partially mediated by risk aversion, which is conceptually closely related to risk perception. Individuals with high levels of neuroticism tend to have greater risk perception and higher levels of risk aversion, thus being less motivated to make long-term investment decisions. This study reinforces the view that personality characteristics such as neuroticism can influence investment decisions through the mechanism of risk perception or attitude.

Previous research has shown that sensation seeking by means of lowered risk perception, it indirectly influences investment decisions positively. High levels of sensory seeking usually translate into lower risk awareness. and are therefore more willing to make high-risk investment decisions (Ferdinand, 2023; Müser *et al.*., 2024; Son & Jeong, 2023).

H₈: Risk Perception mediates the relationship between Overconfidence and Investment Decision.

H₉: Risk Perception mediates the relationship between Neuroticism and Investment Decision.

H₁₀: Risk Perception mediates the relationship between Sensation Seeking and Investment Decision.

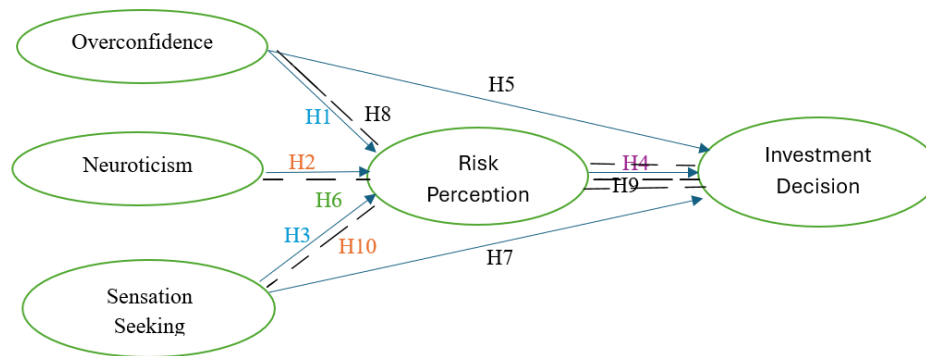


Figure 1. Research Model

A major shortcoming identified in the literature is the lack of empirical studies testing a joint model of overconfidence, neuroticism, sensation seeking, and risk perception as mediators of investment decisions in Indonesia. Furthermore, the dynamic and rapidly evolving Indonesian investment market has not been widely contextualized in investment psychology studies (Kamath *et al.* , 2023). This research aims to address this gap with an integrative modeling approach and current data.

This research is crucial due to the rapid development of the investment market in Indonesia, particularly with the increasing number of new investors from the millennial and Gen Z generations. This growth brings new challenges in the form of risk management and decision-making, which are often influenced by psychological factors such as overconfidence, neuroticism, and sensation seeking. These psychological factors have the potential to lead to irrational investment decisions, making a deeper understanding of the mediating role of risk perception crucial to helping investors make better decisions and reduce potential financial losses (Ahmed *et al.* , 2022). Furthermore, this research makes a significant contribution to the field of behavioral finance, with a local focus that is globally relevant.

In short, this research was selected due to its high relevance to the development of the Indonesian investment market, the existence of an unaddressed research gap, and the urgency of improving the quality of investment decision-making through psychological approaches and financial education.

RESEARCH METHODS

Research Design

This study employs a quantitative explanatory design with a causal survey method to explore the relationship between variables using Structural Equation Modeling (SEM) based on Partial Least Squares (Leiwakabessy *et al.* , 2021). This design is suitable for analyzing the influence of overconfidence, neuroticism, and sensation seeking on stock market investment decisions by placing risk perception as a connecting variable, similar to studies on Indonesian retail investors using PLS-SEM for behavioral finance models. The population includes

individual stock investors in Indonesia (with at least 1-6 months of experience), with a sample of 365 respondents selected via purposive sampling to represent millennials and Generation Z.

Research Object

The research subjects were stock investors aged 17-35 with a minimum of 1-6 months of trading experience, focusing on behavioral finance in Batam City. This research is relevant considering the growth of retail investors, which is projected to reach 17 million SID by 2025, dominated by the younger generation, who are vulnerable to psychological bias. This approach is consistent with international studies targeting individual traders to examine the mediation of risk perception.

Operational Definition of Variables

In this study, there are three independent variables: Overconfidence, Neuroticism, and Sensation Seeking, and the mediating variable is risk perception. The dependent variable is investment decision. These five variables consist of question indicator elements. Each element will be assessed using a Likert scale ranging from 1 to 5, including Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree.

Table 1. Operational Definitions of Variables and Indicators

VARIABLE	Operational Definitions	Measurements and questions	Reference
Overconfidence	Overconfidence is excessive self-confidence. Overconfidence causes investors to overestimate and underestimate their predictions because they overestimate their own abilities. Overconfidence can be described as an unwarranted reliance on reasoning.	5 Items 1. I feel I understand market conditions better than other investors. 2. I am confident that my predictions about stock movements are usually correct. 3. I rarely doubt the investment decisions I have made. 4. I often feel confident that my investment decisions are better than others'. 5. I am confident in my ability to pick profitable stocks even	(Adiputra, 2021)

		when I have limited information.	
Neuroticism	Neuroticism reflects a person's level of emotional stability, with individuals with low levels of neuroticism tending to experience excessive anxiety when facing high-stakes decisions. People who are more neurotic tend to be less predictable and consistent in their emotional reactions.	5 items 1. I easily feel anxious when the stock market declines. 2. I feel stressed when I have to make investment decisions. 3. I tend to imagine the worst-case scenario when investing. 4. When stock prices drop, I panic and want to sell immediately. 5. I easily feel uncertain about my own investment decisions.	(Jiang <i>et al</i> ., 2024)
Sensation Seeking	Individuals with high sensation seeking often seek intense stimulation, such as extreme activities or risky decisions, driven by four dimensions: thrill-seeking (adventure), experience-seeking (sensory experiences), disinhibition	5 items 1. I enjoy trying new types of investments even though they are risky. 2. I feel challenged by investing in high-risk assets. 3. I enjoy the thrill of rapidly fluctuating stock prices. 4. I am drawn to investing because it offers a thrilling and uncertain experience. 5. I feel excited when	(Son & Jeong, 2023)

	(lack of social inhibition), and boredom susceptibility (easily bored). This concept was first developed by Marvin Zuckerman in the 1960s through the Sensation Seeking Scale (SSS).	pursuing high-risk investment opportunities.	
Risk Perception	Risk perception is defined as how an individual views and evaluates the level of risk associated with an investment. Risk perception is dynamic and can change based on individual factors, market conditions, and cognitive biases, distinguishing it from a relatively stable risk attitude.	5 items 1. I feel that investment decisions involve risks that must be carefully considered. 2. I view stock investing as a risky activity. 3. I always consider the possibility of loss before investing. 4. I feel the need to understand the risks in detail before making an investment decision. 5. I consider the stock market to have a high potential for uncertainty.	(Almansour <i>et al</i> ., 2023)
Investment Decision	Investment decisions are the process of selecting alternative allocations of	5 items 1. I choose investments based on analysis that I believe will be most profitable. 2. I feel confident that	(Adiputra, 2021).

	funds across various instruments or assets expected to provide maximum future returns, taking into account several important factors that form the basis for determining investment choices. These factors include demographic variables such as age, gender, experience, education level, and income level.	my investment decisions are sound. 3. I feel that my investment decisions align with my financial goals. 4. I make investment decisions based on information I trust. 5. I invest in assets that I believe will provide long-term returns.	
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Data collection technique

The data collected in this assessment is primary data in the form of a Google Form questionnaire distributed through social media. A questionnaire is a research tool made up of a number of questions meant to compile responder data. The non-probability purposive sampling technique ensured that respondents had been actively trading stocks for at least 1-6 months to ensure relevance to behavioral bias. In this study, 25 indicators were selected as the reference for determining the sample size. Based on the guidelines of (Hair *et al.*., 2011) which recommend a sample size of 10 times the number of indicators, the minimum sample size required is approximately 250 respondents (10 x 25).

Data Analysis Methods

Using SmartPLS version 4, quantitative analysis was done using the Structural Equation Modeling - Partial Least Squares (SEM-PLS) software. This method was chosen because it can simultaneously analyze causal relationships between latent variables, both direct and indirect, and does not require normally distributed data. It can be used with relatively small sample sizes (Hair *et al.*., 2014).

The information analysis was carried out through several steps: descriptive statistics, common method bias testing Assessment of the measurement framework (outer framework), structural framework (inner framework), and hypothesis evaluation, along with the analysis of the outer framework (validity, dependability: factor loading greater than 0.7, AVE greater than 0.5, Cronbach's Alpha greater than 0.7, Composite Reliability greater than 0.7) and the inner framework (R^2 , f^2 , Q^2 , path coefficients).

RESULT AND DISCUSSION

Descriptive Statistics

Based on the processed data, it was explained that of the 365 respondents, the majority were male (193) (52.88%), while female (172) were women (47.12%). This indicates a fairly balanced gender distribution, although there were slightly more men. In terms of age, the majority of participants were in the 17–20 age group, with a total of 156 participants (42.74%). The next age group was 21–25, with 95 participants (26.03%), followed by 26–30, with 62 participants (16.99%), and 30–35, with 52 participants (14.25%). This data indicates that the participants were predominantly young, who can be categorized as novice investors.

Regarding educational background, the majority of participants had a high school education or equivalent, namely 223 participants (61.10%). Ninety-nine (27.12%) participants had at least a bachelor's degree, while only 43 (11.78%) had a diploma. This indicates that most participants were still in secondary education or pursuing higher education. In terms of investment experience, many participants had 6–12 months (151) participants (41.37%), followed by 1–6 months (114) participants (31.23%), more than 1 year (73) participants (20.00%), and only one month (23) participants (6.30%). These findings indicate that the majority of participants were relatively new investors.

Based on data analysis from 365 respondents, most participating individuals started investing in the stock market with a relatively small amount. There were 145 participants (39.73%) who made their first investment in the range of IDR 100,000–IDR 500,000, followed by 112 individuals (30.68%) who chose the range of IDR 500,000–IDR 1,000,000. Furthermore, 59 individuals (16.16%) started with investments exceeding IDR 1,000,000. On the other hand, 49 participants (13.42%) chose to start with IDR 100,000. These results indicate that the majority of novice investors tend to take their initial steps with minimal capital, reflecting a sense of caution and limited experience in making investment choices in the stock market.

Table 2. Sample Characteristics

Characteristics	Criteria	Total	Percentage
Gender	Male	193	52.88%
	Female	172	47.12%
Age	17 - 20 years	156	42.74%
	21 - 25 years	95	26.03%

Characteristics	Criteria	Total	Percentage
Last Education	26 – 30 years	62	16.99%
	30 – 35 years	52	14.25%
	Senior High School	223	61.10%
	S1	99	27.12%
	Diploma	43	11.78%
Investment experience	1 month	23	6.30%
	1-6 month	114	31.23%
	6-12 month	151	41.37%
	>1 years	73	20.00%
Nominal investment for the first time	Rp. 100.000	49	13.42%
	Rp.100.000-500.000	145	39.73%
	Rp.500.000-1.000.000	112	30.68%
	>Rp. 1.000.000	59	16.16%

Validity and Reliability Test Results

To guarantee that the measuring tools applied properly evaluated the constructs in this study, validity and reliability testing were carried out. Reliability was assessed using Cronbach's Alpha and Composite Reliability; validity was evaluated by looking at the outer loading and Average Variance Extracted (AVE) values.

Table 3. Construct Validity Testing

Variable	Indicator	Outer Loading	AVE	Cronbach Alpha	Composite Reability
OC	OC1	0.839	0.643	0.864	0.892
	OC2	0.833			
	OC3	0.706			
	OC4	0.801			
	OC5	0.822			
NM	NM1	0.866	0.727	0.906	0.907
	NM2	0.848			
	NM3	0.852			
	NM4	0.848			
	NM5	0.850			
SS	SS1	0.825			0.858
	SS2	0.797			

	SS3	0.715	0.633	0.854	
	SS4	0.831			
	SS5	0.804			
RP	RP 1	0.759	0.513	0.762	0.763
	RP 2	0.730			
	RP 3	0.662			
	RP 4	0.748			
	RP 5	0.677			

ID	ID 1	0.761	0.543	0.789	0.791
	ID2	0.706			
	ID3	0.769			
	ID4	0.709			
	ID5	0.737			

From the analysis, all indicators for each variable showed outer loading values, most of which exceeded the minimum value of 0.70. For the dependent variable, the outer loading values ranged from 0.706 to 0.769, indicating that all indicators effectively represented the construct. The NM variable showed a higher outer loading value, between 0.848 and 0.866, indicating excellent validity. The same was true for the OC variable, with values ranging from 0.706 to 0.839, and the SS variable, with values ranging from 0.715 to 0.831. On the other hand, for the RP variable, there was one indicator with a value slightly below 0.70, namely 0.662. However, this figure is still acceptable in the context of exploratory research as it is close to the recommended minimum limit.

In addition to measuring outer loadings, validity testing can also be seen from the AVE values, all of which are above 0.50. The NM variable showed the highest AVE value, at 0.727, followed by OC with a value of 0.643, SS with a value of 0.633, ID with a value of 0.543, and RP with a value of 0.513. These values indicate that each construct can explain

more than half of the variance in its indicator, indicating that the validity test results have been achieved successfully.

Furthermore, the reliability analysis showed that all constructs had Cronbach's Alpha values greater than 0.70, indicating good internal consistency. The NM variable recorded the highest value of 0.906, followed by OC with 0.864, SS at 0.854, ID at 0.789, and RP at 0.762. This finding is also supported by the Composite Reliability values which are all above 0.70, with most approaching or even exceeding 0.85. This indicates that the measuring instrument in this study has a very good level of reliability in assessing the constructs studied. Overall, the results of the validity and reliability tests indicate that all indicators and constructs in this study meet the requirements set in the PLS-SEM analysis. Thus, it can be concluded that the measuring instrument of this study is valid and reliable, so it is suitable for use for further analysis on the structural model.

Discrimination Validity Test

The Heterotrait-Monotrait Ratio (HTMT) criterion was used to determine discriminant validity by assessing the degree to which the concepts are practically distinct from each other (Hair *et al.*, 2017).

Table 4. Heterotrait-Monotrait Test (HTMT)

	ID	NM	OC	RP	SS
ID					
NM	0.190				
OC	0.183	0.319			
RP	0.879	0.643	0.097		
SS	0.476	0.878	0.193	0.839	

Discriminant validity was tested using the HTMT method to ensure that each construct in the model is empirically distinct. The criterion applied was that the HTMT value must be less than 0.90. Data processing results showed that all HTMT values were below this threshold, such as RP-ID at 0.879, SS-NM at 0.878, and SS-RP at 0.839. Although some values approached 0.90, all were within acceptable limits. This indicates that each variable in this study is clearly distinct and does not overlap. Therefore, it can be concluded that discriminant validity has been met and the model is suitable for further analysis.

Direct Effect Test

Table 5. Results of the direct influence test between variables

Variable	Coefficients	P values	T statistics (O/STDEV)	Result	Hypotesis
OC -> RP	0.069	0.180	1.342	Insignificant	Rejected
NM -> RP	0.051	0.441	0.771	Insignificant	Rejected
SS -> RP	0.650	0.000	9.353	Significant & positive	Accepted
RP -> ID	0.765	0.000	13.998	Significant & positive	Accepted
OC -> ID	0.138	0.000	3.647	Significant & positive	Accepted
NM -> ID	-0.318	0.000	5.218	Significant & Negative	Accepted
SS -> ID	0.143	0.023	2.279	Significant & positive	Accepted

The results of the direct effects test indicate that not all relationships between variables have a significant impact. The NM variable has a significant negative impact on ID ($\beta = -0.318$; $p < 0.001$), In line with Jiang *et al.* , (2024), who found that emotionally unstable investors are often more risk-averse, neuroticism and investment decisions have a negative relationship. Similarly, Kevin *et al.* , (2023) found that neurotic people often have more anxiety when making financial decisions, which causes them to invest more conservatively, indicating that increasing NM actually reduces ID. Conversely, OC has a positive and significant effect on ID ($\beta = 0.138$; $p < 0.001$), Overconfidence's favorable impact on investment decisions helps Adiputra, (2021) who discovered that confident investors often depend on their own judgment in investment decisions. Similar results were also noted by Cuandra & Setiawan, (2025) and Willie Kurnijanto *et al.* , (2025), who found that overconfidence drives investors to trade more often, meaning that a higher OC value increases ID. Furthermore, RP proved to be the variable with the greatest impact on ID ($\beta = 0.765$; $p < 0.001$), Investors with more risk awareness tend to make more sensible investment decisions, according to Yoga *et al.* , (2025) , hence risk perception has a major impact on investment decision. Likewise, Willie Kurnijanto *et al.* ,(2025) and Togan *et al.* , (2025) found that knowing investment risk helps investors to more closely review financial data before investing, thus it can be considered the main factor in this model. The SS variable also proved

to have a positive and significant impact on ID ($\beta = 0.143$; $p = 0.023$), Consistent with (Son & Jeong, 2023), who discovered that thrill-seeking people often participate in risky investment activity, the major impact of sensation-seeking on investment decisions is evident. Müser *et al* ., (2024) found similar results, showing that sensation seeking motivates investors to seek riskier investing chances.

On the other hand, not all variables had a significant effect on RP. NM did not show a significant effect on RP ($\beta = 0.051$; $p = 0.441$), Risk perception was found to not be much affected by neuroticism. This result contradicts Pavliček *et al* ., (2021) and Zhang & Fan, (2022), who found that those with high neuroticism typically see more risk because of their emotional instability and anxiety. The qualities of respondents who are mostly young investors with access to lots of investing knowledge and digital financial platforms help to explain the difference, as did OC ($\beta = 0.069$; $p = 0.180$) The data point to little influence of too much self-assurance on risk perception among Batam City stock investors. This conclusion runs against the results of Almansour *et al* ., (2023), who found that overconfident investors usually undervalue investment risks, therefore lowering the perceived risk. Likewise, Nadhila *et al* ., (2024) observed that the way investors evaluate financial risk depends significantly on overconfidence. The lack of a major link found in this study could imply that, notwithstanding their confidence in their talents, investors objectively evaluate investment risks before to taking financial decisions. In contrast, SS showed a positive and significant impact on RP ($\beta = 0.650$; $p < 0.001$), The good impact of sensation seeking on risk assessment supports Kumar *et al* . (2024), who found sensation seeking to be a significant predictor of hostile investing conduct. This result is also in line with Almansour *et al* ., (2023), who proposed that risk perception among investors shapes investment decisions through psychological traits, indicating that SS plays an important role in improving RP. Thus, the results of the direct effect test between these variables indicate that RP is the main variable that influences ID, while SS plays an important role both directly on ID and indirectly through RP. On the other hand, NM and OC only have a direct impact on ID without going through RP.

Indirect Effect Test

Table 6. Results of the indirect influence test between variables

	Coefficients	P values	T statistics (O/STDEV)	Result	Hypotesis
OC -> RP -> ID	0.053	0.175	1.355	Insignificant	Rejected
NM -> RP -> ID	0.039	0.440	0.772	Insignificant	Rejected

SS -> RP - > ID	0.497	0.000	7.149	Significant	Accepted
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The result of the indirect effect assessment demonstrate that investment choices cannot be swayed by every variable via the mediating factor of Risk Perception. The primary discovery highlighted that sensation seeking affects investment choices through risk perception, displaying a notable and positive influence ($\beta = 0.497$; $p < 0.001$). The mediating influence of risk perception on the relationship between sensation seeking and investment choice corroborates (Ferdinand, 2023; Müser *et al.* , 2024; Son & Jeong, 2023). These studies always showed that people with more sensation-seeking tendencies are more likely to take on investment risk, which then results in more active investment decisions. This indicates that risk perception functions as an efficient mediator in the relationship. This means that individuals with high levels of sensation seeking tend to have stronger risk perceptions, which in turn drive their investment decisions.

On the other hand, the mediation pathways between risk perception and neuroticism and investment decisions ($\beta = 0.039$; $p = 0.440$). Furthermore unable to mediate the link between neuroticism and investment decisions was risk perception. This finding differs from Haqqani *et al.* , (2025), who postulated that risk-related attitudes mediate the effects of personality qualities on investment results. and overconfidence and risk perception through risk perception ($\beta = 0.053$; $p = 0.175$) did not show significant results, Risk perception's mediating influence on the link between overconfidence and investment decision was not supported. This result contradicts (Arie Wibowo *et al.* , 2023; Ferdinand, 2023), who found that risk perception greatly modulates the effect of overconfidence on investment choices. This indicates that risk perception is unable to mediate the influence of neuroticism and overconfidence on investment decisions. Therefore, these two variables have a more direct impact on investment decisions than through risk perception. Overall, these findings suggest that The mediating influence of risk attitude is selective; it is only beneficial for the link between sensation seeking and investment decisions, not for the one between neuroticism and overconfidence. Therefore, risk perception might be seen as a mediator in this study model.

R-Square data test results

Table. 7 R-Square

	R-square	R-square adjusted
ID	0.550	0.545
RP	0.464	0.460

The R-square value for investment decisions is 0.550, meaning that 55% of the change in investment decisions can be explained by neuroticism, overconfidence, sensation seeking, and risk perception, while 45% is influenced by other factors outside the model. The R-square

value for risk perception is 0.464, indicating that 46.4% of the variation in risk perception can be explained by neuroticism, overconfidence, and sensation seeking, while 53.6% comes from other variables. Since both R-square values are in the fair range, the model possesses somewhat strong explanatory ability. These results taken together point to the possibility that risk perception plays a mediating role selectively, that is, only for the link between sensation seeking and investment choices but not for the one involving neuroticism and overconfidence. Therefore, risk perception might be regarded as a mediator in this study model.

CONCLUSION AND RECOMMENDATION

Conclusion

This study aimed to analyze the influence of overconfidence, neuroticism, and sensation seeking on investment decisions with risk perception as a mediating variable among Generation Z and Millennial stock investors in Batam City. Based on the results of data analysis using SEM-PLS, several conclusions can be drawn. First, overconfidence does not significantly influence risk perception. This indicates that investors with high confidence in their abilities do not necessarily perceive investment risks differently. However, overconfidence has a positive and significant influence on investment decisions. Investors who are more confident tend to make investment decisions more actively and aggressively.

Second, neuroticism does not significantly influence risk perception. Nevertheless, neuroticism has a significant negative effect on investment decisions. Investors with higher emotional instability and anxiety tend to be more cautious and less confident in making investment decisions.

Third, sensation seeking has a positive and significant effect on both risk perception and investment decisions. Investors who enjoy challenges and risky experiences tend to perceive investment risks differently and are more willing to make investment decisions involving higher risks.

Fourth, risk perception has a positive and significant influence on investment decisions. This finding shows that investors who understand and evaluate risks carefully are more likely to make investment decisions confidently.

Fifth, risk perception only mediates the relationship between sensation seeking and investment decisions. Meanwhile, risk perception does not mediate the relationship between overconfidence and investment decisions nor between neuroticism and investment decisions.

Overall, this study confirms that psychological and behavioral factors play an important role in shaping investment decisions among young investors in Batam City. Therefore, improving financial literacy and investor awareness regarding psychological biases is important in order to encourage more rational and sustainable investment behavior.

Recommendations

Based on the results of this study, several recommendations can be proposed.

1. Practical Recommendations

Investors should improve their financial literacy and understanding of investment risks before making investment decisions. Investors are also encouraged to control psychological biases such as excessive confidence and emotional instability in order to avoid irrational investment behavior. Financial institutions, universities, and regulators such as Financial Services Authority and Indonesia Stock Exchange should provide more educational programs related to behavioral finance, risk management, and investment psychology, especially for Generation Z and Millennial investors.

2. Academic Recommendations

Future researchers are recommended to expand the research scope by involving respondents from different regions and larger sample sizes in order to obtain more comprehensive results. Future studies may also include other variables such as financial literacy, herding behavior, emotional intelligence, or financial technology adoption to enrich the behavioral finance model. In addition, future researchers can use different research methods, such as longitudinal studies or mixed methods, to gain deeper insights into investor behavior over time.

Research Limitations

This study has several limitations. First, the research only focuses on stock investors in Batam City, so the results may not fully represent investors in other regions of Indonesia. Second, the study uses a cross-sectional design, which only describes investor behavior within a specific period. Third, the data were collected using self-reported questionnaires, which may contain subjective bias from respondents. Despite these limitations, this study still provides valuable contributions to the development of behavioral finance research, particularly regarding the role of psychological factors and risk perception in investment decision-making among young investors.

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