

Student investors: unpacking the behavioral biases in their stock decisions

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Abstract

This study examines the psychological underpinnings of stock investment decisions among students at Batam State Polytechnic in the context of Indonesia's rapidly expanding capital market. We investigated the influence of herding behavior, overconfidence, risk perception, risk tolerance, and loss aversion on their investment choices. Using a quantitative approach, we administered a 38-item questionnaire to 139 student investors selected through purposive sampling. PLS-SEM analysis revealed that overconfidence and risk perception significantly affect stock investment decisions. Interestingly, herding behavior, risk tolerance, and loss aversion did not show a substantial effect in this context. These findings provide valuable insights into the specific behavioral biases affecting emerging investors in the Indonesian market.

Keywords: Herding Behavior; Overconfidence; Risk Perception; Risk Tolerance; Loss Aversion.

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INTRODUCTION

Financial management skills are essential for preventing errors in the financial decision-making process. To improve quality of life, everyone must know how to manage their finances, for example, by investing in the capital market. Indonesians typically spend their money on consumption, savings, and investment (Salvatore & Esra, 2020). Investing is a type of capital investment undertaken by individuals to obtain future profits. Rational investors will always consider information when making normative choices. However, assumptions about how individuals act when making decisions are not entirely logical due to the influence of many factors. Investors' emotions influence investment decisions in the capital market, which can negatively impact the capital market and cause abnormal market movements (Theressa & Armansyah, 2022).

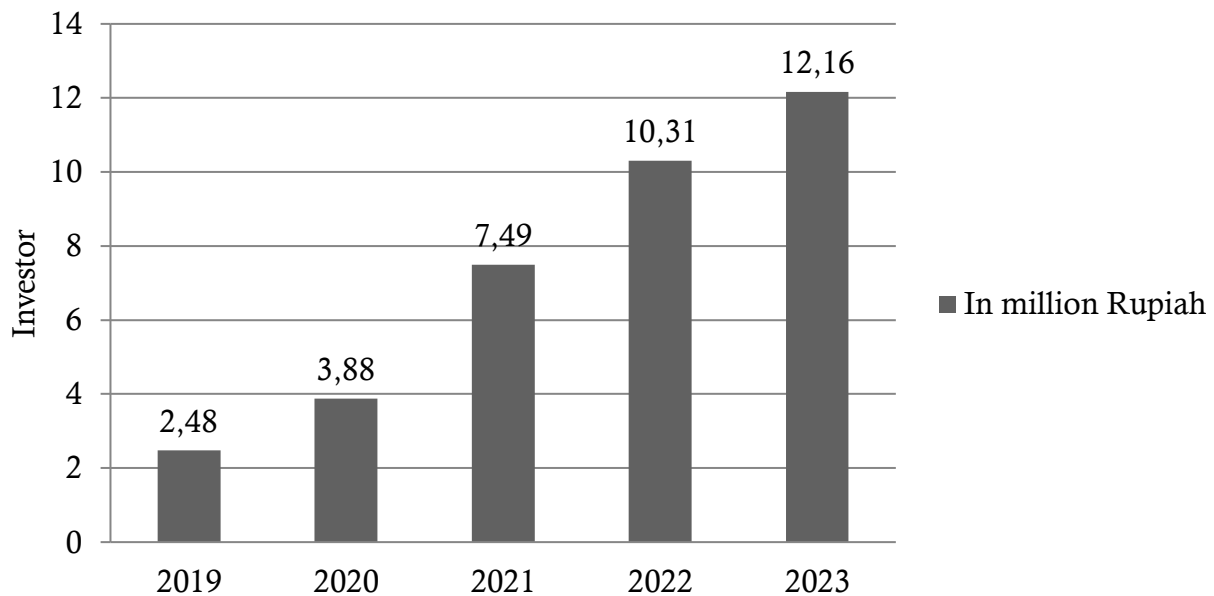


Figure 1. Number of Investors
Source: idx.co.id (2024)

The Indonesian Central Securities Depository (Kustodian Sentral Efek Indonesia or KSEI) recorded 12,475,225 stock market investors in February 2024, a 2.52% increase from the end of 2023 (Figure 1). According to the KSEI, investor growth has been very good to date, with an increase of approximately 200,000 in February 2024 (Adventy, 2024). Rapid technological advancements, combined with increasingly open access to information, have fueled a surge in enthusiasm among Generation Z to enter the capital market. According to data from the Indonesian Central Securities Depository (KSEI), the cumulative number of Single Investor Identification (SID) holders reached 20.32 million by the end of 2025, representing a growth of approximately 37% compared to the previous year (Ekonomi, 2025). Moreover, data indicates that 55.07% of these investors are under the age of 30 (Sari & Akbar, 2024). This figure reflects how the accelerating pace of digitalization and the proliferation of online-based financial products are working together to boost the participation of the younger generation in the investment sector. Although the number of market participants is trending upward, this growth unfortunately does not correlate with the financial proficiency needed to formulate prudent investment strategies. This phenomenon warrants attention, given that nearly 70% of investors in the country are from Gen Z, a demographic known to prefer instant returns over long-term gains. Such a mindset risks driving impulsive investment decisions made with little objective consideration, thereby heightening the risk of financial loss (Yulianti et al., 2025). Against this background, an in-depth study of the investment decision-making process within the Generation Z segment is considered an urgent necessity.

The subjects of this study were Generation Z students at Batam State Polytechnic. Currently, student interest in investing is very high, as evidenced by the capital market demographic, which reaches 53% for those aged 30 and under. For those aged 40 and under, the interest of all capital market investors in Indonesia reaches 80% (Midaada, 2024). It is known that Generation Z is often an easy target for illegal investments and unauthorized online loans. They are vulnerable because they are easily accessible and tend to be attracted to tempting offers. One way to address this problem is by providing financial literacy to the Gen Z generation (Ningsih, 2024). Research by Pahlevi and Oktaviani (2018) found that appropriate capital market literacy and education can enhance investment analysis skills and prevent students from incurring debt. Behavioral finance studies how investor psychology influences investment decisions. Encouragement from those closest to us, interactions, and social pressure are the main factors that influence investment interest (Akhtar and Das, 2019).

Previous research shows that risk perception has a significant negative impact on investment decisions, while risk tolerance and overconfidence have a considerable positive impact. Conversely, loss aversion does not affect investment decisions (Nur Aini & Lutfi, 2019). Rahma's (2023) research found that risk tolerance has no significant impact on investment decisions. Nugraha and Rahadi's (2021) study examined the perceptions of young Indonesians, specifically millennials (Generation Y) and Generation Z, regarding their interest in stock investment, using the Theory of Planned Behavior (TPB). Nugraha and Rahadi's findings reveal that not all perceptual variables from the TPB were significant in predicting stock investment intentions among young Indonesians; only attitudes toward the behavior had a significant effect. This finding contradicts previous literature. Furthermore, the education level of young Indonesians also plays a moderating role in influencing stock investment intentions (Nugraha & Rahadi, 2021).

The novelty of this study lies in the addition of the behavioral herding variable, as investors' behavior is crucial for understanding stock market movements when making investment decisions. To date, the Indonesian capital market remains highly volatile, with significant variations in the Jakarta Composite Index (JCI) value (Pahlevi & Oktaviani, 2018). This study aims to confirm the findings of several previous studies that have examined factors influencing investment decisions and to expand on prior research on other variables related to these factors. Several questions will be partially explored in this study: (1) whether herding behavior influences investment decisions; (2) whether overconfidence influences investment decisions; (3) whether risk perception influences investment decisions; (4) whether risk tolerance influences investment decisions; and (5) whether loss aversion influences investment decisions. This research is expected to improve our understanding of financial behavior, particularly the factors that influence investment decisions.

Prospect Theory

Prospect theory helps investors make decisions when assessing various risks. Prospect theory stems from Kahneman and Tversky's (1979) study of human decision-making, which is considered unusual and contradictory. Investors consider potential gains and losses according to their preferences. In short, prospect theory reveals an irrational tendency for people to be more risk-averse when faced with potential losses compared to possible gains. In situations of loss, individuals tend to be more willing to take risks than in situations of success. Individuals perceive losing a certain amount of money in a bet as more painful than winning the same amount. Consequently, when they experience losses, they are more likely to take risks (Pahlevi and Oktaviani, 2018). Prospect Theory provides a unified behavioral framework that captures the irrationalities your study aims to investigate, making it a robust and theoretically sound baseline for your research on student investment decisions. Students typically lack experience and rely heavily on mental shortcuts (heuristics). Prospect Theory was designed precisely to model how inexperienced or non-expert decision-makers behave under uncertainty, making it ideal for a student sample.

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) evolved from the Theory of Reasoned Behavior. The TPB is a conceptual framework intended to explain the factors that influence individual behavior. A person's intention to behave in a particular way is the primary component influencing their behavior. Three elements influence behavioral intention: attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). TPB can explain why students form the intention to invest, and how social, cognitive, and psychological factors collectively drive that intention.

Literature Reviews

Previous studies have shown that risk perception has a significant negative influence on investment decisions, while risk tolerance and overconfidence have a considerable positive impact on investment decision-making. Conversely, loss aversion does not affect investment decisions. This study involved 400 workers in Surabaya and Jombang (Nur Aini & Lutfi, 2019). Research by Adielyani and Mawardi (2020) indicates that higher levels of overconfidence, herding behavior, and risk tolerance are associated with increased stock investment decisions. Conversely, lower levels of overconfidence, herding behavior, and risk tolerance lead to lower levels of stock investment decisions. Research by Rahma (2023) found that risk perception, anchoring, and herding have a significant and positive impact on investment decisions. On the other hand, risk tolerance does not contribute significantly to investment decisions. Research by Pahlevi and Oktaviani (2018) found that attitude, subjective norm, perception of behavioral control, overconfidence, excessive optimism, and herd behavior all contribute positively to investor intentions. There is no relationship between risk psychology and investor attitudes towards investing.

Attitude partially mediates the relationship between financial knowledge and investment intentions, while financial self-efficacy plays a dual role in the relationship between personality traits and investment intentions. Subjective norms, on the other hand, have a weak positive effect on investment intentions. In other words, an individual's attitude toward investment plays a significant role in linking financial knowledge to investment intentions. In contrast, financial self-confidence influences both directly and through its influence on personality traits. Subjective norms, although positively influential, have a relatively small impact on investment intentions (Akhtar and Das, 2019). Further studies have found that overconfidence bias makes a significant and positive contribution to investment decisions. In contrast, cognitive dissonance bias and herding bias do not significantly contribute to investment decisions. This suggests that investors are more likely to rely on emotional factors than cognitive and social factors when making investment decisions. Investors who are overconfident in their abilities often make suboptimal investment decisions, which can lead to losses (Chris Setiawan, Dorkas Rambu Atahau, and Robiyanto, 2018).

Furthermore, socioeconomic factors can influence investment decisions, including return expectations, self-efficacy, and risk perception. Socioeconomic factors can also influence investment decisions through expectations of returns, self-efficacy, and risk perception. However, risk perception directly influences millennials' stock investment decisions (Ratnadi, 2023).

Overconfidence bias, herding bias, and endowment bias also impact how investors make investment decisions. Partial test results also support the notion that each of these components has a positive impact on investment decisions (Theressa and Armansyah, 2022). Additional studies found that overconfidence and risk tolerance influence investment decisions. Investors in this group are confident and prefer high risks with high returns. Conversely, risk perception has no impact on investment decisions. Investors with higher financial literacy tend to feel less need to apply their financial knowledge when making investment decisions (Pradikasari and Isbanah, 2018). Research by Fridana and Asandimitra (2020) found that overconfidence, herding, risk tolerance, and risk perception influence investment decisions. This finding is due

to respondents having a good understanding of finance, high self-confidence in decision-making, following the behavior of other investors, being cautious in decision-making, and considering risks when investing. Research by Rahman and Gan (2020) found that herding did not significantly influence investment decisions. Furthermore, overconfidence negatively impacts investment decisions, as evidenced by the fact that the greater the overconfidence an investor exhibits, the lower the accuracy of their investment decisions. Overconfident individuals underestimate the margin of error they will make. Investors with high overconfidence tend to be more daring in their decision-making, while those with low overconfidence are more cautious. Loss aversion bias does not significantly affect investment decisions, as investors tend to be less afraid of losses (Pradhana, 2019).

Research by Wildan Mutawally and Asandimitra (2019) found that risk perception does not influence investment decisions. This is because investors tend to be less cautious in their investment decisions, as they are often based on practical considerations that are deemed correct. Furthermore, the herding variable influences investment decisions because young investors tend not to be independent in making investment decisions. Research by Nur Aristiwati and Kholid Hidayatullah (2021) also found that herding and overconfidence variables influence investment decisions. Investors tend to rely on information they obtain through internet technology, which they have mastered, thus increasing their confidence when making investment decisions. Herding behavior influences investment decisions. Investors tend to react more quickly to changes in other investors' investment decisions than to their own. Meanwhile, the overconfidence variable does not significantly influence investment decisions. Respondents who conduct stock transactions with high frequency tend to produce analytical accuracy and maximize benefits in these transactions (Afriani & Halmawati, 2019).

Adiputra's (2021) research states that overconfidence influences investment decisions. The higher an investor's confidence, the greater their willingness to choose higher-risk investments. Overconfident investors tend to be more confident in their decision-making. Furthermore, risk tolerance also influences investment decisions. Investors can determine their risk tolerance based on the instrument, investment objectives, returns, and available investment funds, thereby facilitating informed investment decisions.

Albart's (2024) research found that herding variables did not significantly impact investment decisions. This is due to increased awareness and understanding of investment risks among the workforce, leading to more independent and informed decision-making. Herding behavior and risk perception influence investment decisions, while overconfidence does not. This is because experienced investors often avoid excessive overconfidence (Pratama et al., 2020).

Hypothesis Development

The Influence of Herding Behavior on Investment Decisions

A dual theoretical approach offers a comprehensive lens for understanding why herding tendencies shape the way students make investment choices. Drawing on Prospect Theory, herding can be interpreted as a cognitive shortcut, one that emerges from deep-seated fear of losses, a tendency to measure personal outcomes against those of peers, and an overestimation of improbable gains. These psychological distortions nudge students toward imitative actions, steering them away from careful evaluation of underlying asset value. In parallel, the Theory of Planned Behavior provides a complementary angle by framing herding as a socially driven process. In this view, students are influenced by the perceived expectations of their social circles, while also gaining a false sense of capability simply from witnessing others actively participate in the market. When these cognitive biases and social pressures converge, the result is a clear prediction: the more intense the herding impulse, the more pronounced the resulting investment decisions tend to be, regardless of whether those decisions are fundamentally sound or not. Herding refers to the act of investors following the investment actions of others without conducting in-depth analysis beforehand, which can result in market inefficiency. Investors with

herding characteristics tend to disregard their personal information and imitate the actions of other investors. They ultimately leave the market collectively, continuing to move in the same direction (Virgineni and Bhaskara Rao, 2017). According to Chris Setiawan, Dorkas Rambu Atahau, and Robiyanto (2018), herding in investors can occur because they have similar information, leading them to make similar decisions. Furthermore, herding can also occur when investors have different information but choose to ignore it and follow the decisions of other investors. Therefore, the higher the herding behavior, the greater the tendency of millennial investors to make stock investment decisions (Adielyani & Mawardi, 2020). Based on the TPB, herding behavior increases risk because investors tend to disregard their confidence and imitate the actions of other investors (Chris Setiawan, Dorkas Rambu Atahau, and Robiyanto, 2018). Rahma's (2023) research indicates that herding variables influence investors' investment decisions.

H1: The herding behavior influence on investment decisions

The Influence of Overconfidence on Investment Decisions

To truly understand how overconfidence sways students' investment choices, it helps to look through two complementary theoretical windows. On one side, Prospect Theory reveals the internal mental distortions at play, how overconfident students miscalculate odds, dismiss potential losses, and cling to unrealistic benchmarks, all of which push them toward bold but often reckless decisions. On the other side, the Theory of Planned Behavior exposes the social and intentional dynamics: how overconfidence transforms investing into an attractive pursuit, gains momentum from peer influence, and creates an illusion of full control, ultimately hardening students' resolve to act. Together, these perspectives suggest that overconfidence doesn't just nudge students toward investing; it fundamentally rewires how they perceive risk, ability, and social pressure, making them far more likely to commit to investment decisions that feel right in the moment but may lack a rational foundation. Overconfidence refers to the tendency to feel overly confident and sure of one's abilities (Pradikasari & Isbanah, 2018). Most investors feel so satisfied in their experience and ability to select stocks that they believe the outcome will meet their expectations, leading to an overconfidence bias in decision-making. These results confirm that investors demonstrate courage in making high-risk stock investment decisions (Chris Setiawan, Dorkas Rambu Atahau, and Robiyanto, 2018). If someone is more confident, they will trade more frequently. Conversely, if they are less confident, they will be more cautious in their actions (Fridana & Asandimitra, 2020). These results are consistent with the TPB, which states that individuals who act irrationally tend to have overconfidence in their abilities and experience, while ignoring potential risks (Fridana & Asandimitra, 2020). This indicates that the greater a person's trust and confidence, the more likely they are to invest their money in high-risk assets, and vice versa (Nur Aini & Lutfi, 2019).

H2: The overconfidence influence on investment decisions

The Influence of Risk Perception on Investment Decisions

Prospect Theory helps us understand the inner psychological theater, how students mentally construct risk through framing, emotional weight, and distorted probabilities. TPB, on the other hand, helps us understand the outer social and intentional theater, how these constructed perceptions translate into attitudes, social pressures, and confidence levels that ultimately drive the decision to invest or not. Together, they offer a robust, dual-anchored foundation for arguing that risk perception is one of the most influential, yet often overlooked, drivers of student investment behavior. It's not about what the risk actually is, but what the student believes it to be, and that belief can make all the difference. One of the first things a person does when they learn that an asset is at risk is to assess or consider the level of risk. Perception plays a crucial role in evaluating risk in various investment instruments (Nur Aini & Lutfi, 2019). Risk perception is also defined as an individual's assessment of a risky situation based on their psychological characteristics and personal circumstances (Pradikasari & Isbanah,

2018). Suppose someone perceives that the risk of an investment asset is high or potentially dangerous. In that case, they will likely avoid allocating funds to that asset, preferring to invest in safer assets, such as savings or deposits. Conversely, if someone perceives that the risk of a high-risk asset is low, they are more inclined to allocate their funds to riskier assets, such as property or gold (Nur Aini & Lutfi, 2019). This aligns with prospect theory, which suggests that individuals tend to prefer risk-free investments over taking risks. Investors who perceive risk tend to be more cautious in making investment decisions, while investors who perceive low risk are more tolerant of risk and more willing to take risks (Wildan Mutawally & Asandimitra, 2019).

H3: The Risk Perception Influence on Investment Decisions

The Influence of Risk Tolerance on Investment Decisions

Understanding how risk tolerance shapes students' investment choices calls for a dual theoretical perspective that bridges inner psychology and social intention. From the perspective of Prospect Theory, risk tolerance is not a fixed trait but a fluid state influenced by how options are framed, how losses are emotionally weighted, and how probabilities are subjectively interpreted; students with higher risk tolerance tend to downplay potential downsides, overweight the likelihood of positive returns, and set ambitious reference points, all of which nudge them toward bolder, more aggressive investment decisions, while those with lower tolerance perceive even modest uncertainties as threatening and retreat to safer options. Complementing this, the Theory of Planned Behavior reframes risk tolerance as a driver of intentional action, where students who see themselves as capable of handling market swings develop favorable attitudes toward investing, draw confidence from observing peers who embrace similar risks, and perceive fewer barriers to entry, thereby strengthening their intention to commit capital; conversely, students with low risk tolerance view investing as anxiety-inducing, feel socially isolated if their circle takes greater risks, and doubt their ability to navigate volatility, which weakens their resolve to act. Investors often overlook the security aspect when investing because they are more focused on practical investment decisions they believe are correct. They tend to prioritize their personal beliefs over actions deemed most effective, even if they may be less secure (Wildan Mutawally & Asandimitra, 2019). A high level of risk tolerance has a significant positive impact on investment decisions, implying that the greater a person's risk tolerance, the more likely they are to invest in higher-risk assets (Nur Aini & Lutfi, 2019).

H4: The Risk Tolerance Influence on Investment Decisions

The Influence of Loss Aversion on Investment Decisions

Loss aversion, the psychological tendency to feel the sting of losses far more intensely than the pleasure of equivalent gains, finds its theoretical roots in Prospect Theory, which argues that this asymmetry skews how students evaluate investment opportunities; they become overly cautious, shying away from potentially profitable ventures simply because the fear of losing money overpowers the lure of earning it, often leading them to settle for safer, lower-yield options or avoid investing altogether. Complementing this, the Theory of Planned Behavior adds a social and intentional dimension, suggesting that loss-averse students develop negative attitudes toward risky investments, perceive social disapproval from peers who may view losses as failures, and doubt their own ability to recover from financial setbacks, all of which weakens their intention to invest and pushes them toward inaction or overly conservative choices. Loss aversion can occur when investors tend to avoid losses rather than seek profits. As a result, investors prefer to protect their capital from decline because they fear losses more than they believe in the potential profits they will generate from their investments (Pradhana, 2019). This aligns with prospect theory, which suggests that investors are more likely to calculate potential gains and losses according to their preferences. According to Pratama et al. (2020), loss aversion influences investment decisions. This means that investors who are overly fearful of risk and continually strive to avoid losses in investing often hinder rational and appropriate investment

decision-making. This aligns with research by Ariefin Addinpujoartanto and Darmawan (2020), which shows a significant influence of loss aversion on investment decisions.

H5: The loss aversion influence on investment decisions

RESEARCH METHODS

This quantitative research employs a causal approach to examine the impact of herding behavior, overconfidence, risk perception, risk tolerance, and loss aversion on stock investment decisions. Primary data were obtained through an online questionnaire compiled based on indicators from previous studies that have been tested for validity and reliability. All items were measured using a five-point Likert scale. Respondents were students at Batam State Polytechnic who belonged to Generation Z (born 1997–2012) and had experience purchasing shares. The sample size was determined using the Hair et al. formula, with a total of 139 respondents, taken through a non-probability sampling technique with a purposive sampling method, with the following criteria: a) Generation Z or born between 1997 and 2012 at Batam State Polytechnic, and b) Students who were registered as investors or had previously purchased shares.

Table 1. Number of Samples

Description	Total
Questionnaires are distributed	200
Returned questionnaires	159
Questionnaires that do not meet the criteria:	
- Age above 28 years	(5)
- Never made a stock purchase	(15)
Total Sample	139

Source: Data were processed (2024)

Research Variables

This study uses investment decisions as the dependent variable and herding behavior, overconfidence, risk perception, risk tolerance, and loss aversion as independent variables, as shown in Table 2 below. The questionnaire items are included in Table 3.

Table 2. Measurement of Variables Indicators

Variable	Definition	Indicator	Source
Investment Decision	The process of selecting the best option from several available choices is influenced by various interrelated factors (Fridana & Asandimitra, 2020).	Return on Investment, Risk, Period (time factor).	(Adielyani and Mawardi, 2020)
Herding behavior	Behavior in the market where investors tend to make the same investment decisions or imitate the actions of other investors, often without considering information independently (Theressa & Armansyah, 2022).	Stock Volume Level, Sales and purchases of stocks, Stock type selection, Changes to other investors.	(Adielyani and Mawardi, 2020)
Overconfidence	The tendency to feel overly confident and self-assured about one's knowledge or	Trust in your knowledge, Believe in your abilities, Trust in the experience you have.	(Nur Aini and Lutfi, 2019).

Variable	Definision	Indicator	Source
	abilities (Pradikasari & Isbanah, 2018).		
Risk preception	Investors' actions towards risky situations, which depend on their conditions and psychological characteristics (Pradikasari & Isbanah, 2018).	Investments that are appropriate and will provide good performance, Future investment with significant value, Investments that generate excellent returns.	(Nur Aini and Lutfi, 2019)
Risk tolerance	Risk tolerance is the extent to which a person is willing to take risks when investing (Budiarto & Susanti, 2017).	Probability of profit and loss, Investment preferences, Investment situation.	(Nur Aini and Lutfi, 2019)
Loss aversion	The tendency for someone to avoid losses rather than seek profits (Pradhana, 2019).	Investments with a predicted risk of loss, Be aware of potential losses, Investments with a proven positive performance track record.	(Nur Aini and Lutfi, 2019)
Source: Researcher (2024)			

Table 3. Questionnaire Item

Variable	Indicators	Question Item	Source
Investment Decision	Return on Investment	Q1: I believe that a high rate of return on investment is the main factor in choosing an investment instrument.	Adielyani and Mawardi (2020)
		Q2: I would prefer to invest my funds in instruments that promise high returns, even if it means taking on greater risks.	
	Risk	Q3: I consider investment risks before making a decision.	
		Q4: I am willing to take greater risks in investments as long as the potential expected returns are comparable.	
Herding behavior	Period (time factor)	Q5: I consider the investment timeframe before making a decision.	Adielyani and Mawardi (2020)
		Q6: I choose investments with a time that suits my financial goals.	
	Stock Volume Level	Q7: I believe that following market trends is a good strategy in selecting stocks.	
		Q8: I feel comfortable with the investment decisions that many other people make.	
	Sales and purchases of stocks	Q9: I prefer to buy shares when many other people are also buying.	
		Q10: I believe that following the buying and selling trends of stocks is a good way to optimize profits.	
	Stock type selection	Q11: I choose the same type of stocks as the majority of investors choose.	

Variable	Indicators	Question Item	Source
Overconfidence	Changes to other investors	Q12: The choice of stock type by other investors has a significant influence on my decision.	Nur Aini and Lutfi (2019).
		Q13: I am worried that my investment decisions will differ from those of the majority of investors.	
		Q14: I believe that monitoring other investors' portfolio changes is an essential part of any investment strategy.	
	Trust in your knowledge.	Q15: I am confident that my knowledge of the investment markets makes my investment decisions better than most people.	
	Believe in your abilities	Q16: I often feel that the information I have is sufficient to make optimal investment decisions.	
		Q17: I believe my ability is better than others in choosing investment assets.	
		Q18: I can completely control the outcome of my investment decisions.	
	Trust in the experience you have	Q19: My experience in investing has benefited my investment decisions.	
	Investments that are appropriate and will provide good performance	Q20: I believe that past experiences help me avoid investment selection mistakes.	
		Q21: I believe that choosing investments that suit my risk profile is a wise move.	
		Q22: I tend to choose investment instruments that have a positive performance track record.	
Risk preception	Future investment with significant value	Q23: I feel confident that investing for the future is an important decision.	Nur Aini and Lutfi (2019).
		Q24: I am confident that the investments I make today will have significant value in the future.	
	Investments that generate excellent returns	Q25: I tend to choose investment instruments that have high profit potential.	
		Q26: I feel optimistic that my investment will generate significant returns.	
Risk tolerance	Probability of profit and loss	Q27: I consider the potential profits before making an investment decision.	Nur Aini and Lutfi (2019).
		Q28: I consider the possibility of loss before making an investment decision.	
	Investment preferences	Q29: I prefer to invest in stable assets with low risk rather than assets with high-profit potential but also high risk.	
		Q30: I often adjust my investment portfolio based on personal preferences for risk and return.	

Variable	Indicators	Question Item	Source
Loss aversion	Investment situation	Q31: I always assess the current market situation before making an investment decision.	Nur Aini and Lutfi (2019).
		Q32: Global economic conditions greatly influence my investment decisions.	
	Investments with a predicted risk of loss	Q33: I consider the possibility of loss before making an investment decision.	
		Q34: I avoid investments that have a predicted probability of loss.	
	Be aware of potential losses.	Q35: I am always wary of potential losses when choosing investments.	
		Q36: Before deciding to invest, I often do a risk analysis.	
	Investments with a proven positive performance track record	Q37: I choose investments based on their positive performance track record.	
		Q38: When making investment decisions, I always choose companies that have performed positively in the past.	

Source: Researcher (2024)

RESULTS AND DISCUSSION

Result

Descriptive Statistics

This study included 139 respondents: 85 female (61%) and 54 male (39%), indicating a predominance of female respondents in the sample. In terms of majors, most respondents came from the Management and Business Department, namely 112 people (80.58%). Other majors included Electrical Engineering (7.91%), Mechanical Engineering (5.04%), and Informatics Engineering (6.47%). This suggests that most respondents have educational backgrounds closely related to economics, management, and business. By semester, most respondents were in the eighth semester (76 students, 54.68%), followed by the sixth semester (51 students, 36.69%). Semesters 4 and 2 were represented by 7 and 5 respondents, respectively.

These data (Table 4) indicate that most study participants were in their final year of study, suggesting they had more mature insights into making financial and investment decisions. By study program, the largest number of respondents came from Managerial Accounting (77 people; 55.40%), followed by Applied Business Administration (18 people; 12.95%) and Accounting (7 people; 5.04%). Meanwhile, other respondents were spread across various engineering study programs, including Informatics Engineering, Mechanical Engineering, Multimedia and Network Engineering, as well as other programs in smaller numbers. Overall, the respondent composition shows a predominance of students with business and managerial backgrounds, and the majority are in their final semester. This provides a strong basis for assuming that respondents have a better understanding of investment concepts, both theoretically and practically. Furthermore, this characteristic strengthens the validity of the data in assessing investment behavior and preferences among Batam State Polytechnic students.

Table 4. Characteristic of Respondents

Characteristic	Category	Respondents	%
Age	13–28 years	139	100.00
Gender	Male	54	38.85
	Female	85	61.15
Faculty	Management and Business	112	80.58
	Electrical Engineering	11	7.91

Characteristic	Category	Respondents	%
Semester	Mechanical Engineering	7	5.04
	Informatics Engineering	9	6.47
	2nd	5	3.60
	4th	7	5.04
	6th	51	36.69
Study Program	8th	76	54.68
	Managerial Accounting	77	55.40
	Applied Business Administration	18	12.95
	Logistics and International Trade	10	7.19
	Accounting	7	5.04
	Mechanical Engineering	7	5.04
	Electronic Manufacturing Engineering	5	3.60
	Information Technology Engineering	4	2.88
	Mechatronics Engineering	4	2.88
	Multimedia and Network Engineering	3	2.16
	Geomatics Engineering	2	1.44
	Instrumentation Engineering	1	0.72
	Electronic Engineering Technology	1	0.72

Source: Processed Data (2024)

Outer Loading

Convergent Validity Test

The outer loading test results (Table 5) show that all indicators have values above 0.50, ranging from 0.596 to 0.734. These values suggest that each indicator contributes sufficiently to measuring the latent construct. Although some indicators have values below 0.70, they are still acceptable because they fall within the tolerance limit for exploratory research and do not reduce the construct's overall AVE. In general, outer loading values that meet the criteria support convergent validity. Therefore, these indicators are suitable for further analysis.

Table 5. Output AVE (Convergent Validity Test)

Variable	Average variance extracted (AVE)	Interpretation
Investment Decision	0,596	Valid
Herding Behavior	0,611	Valid
Overconfidence	0,734	Valid
Risk perception	0,636	Valid
Risk tolerance	0,666	Valid
Loss aversion	0,647	Valid

Source: Processed Data (2024)

Discriminant Validity Test

The results in Table 6 show that the diagonal values (square roots of AVE) for the investment decision variables herding behavior, loss aversion, overconfidence, risk perception, and risk tolerance have values greater than those below them (correlations between constructs). This indicates that each construct has good uniqueness and does not overlap with other constructs in the model. Thus, it can be concluded that discriminant validity has been met and each construct in the model is empirically distinct.

Table 6. Results of the Fornell-Larcker (Discriminant Validity Test)

Variable	X ₁	Y	X ₅	X ₂	X ₃	X ₄	Interpretation
Herding Behavior	0,782						Valid

Variable	X ₁	Y	X ₅	X ₂	X ₃	X ₄	Interpretation
Investment							
Decisions	0,223	0,772					Valid
Loss aversion	0,194	0,364	0,805				Valid
Overconfidence	0,325	0,545	0,430	0,857			Valid
Risk perception	0,324	0,564	0,457	0,609	0,797		Valid
Risk tolerance	0,290	0,427	0,702	0,555	0,642	0,816	Valid

Source: Processed Data (2024)

Reliability Test

All constructs in the model were deemed reliable based on the test results (Table 7), with Cronbach's Alpha values ranging from 0.864 to 0.909 and Composite Reliability values ranging from 0.898 to 0.932. Both values exceeded the minimum threshold of 0.70, indicating that the indicators in each construct have good internal consistency and are stable in measuring the intended variables. Thus, the constructs of herding, overconfidence, risk perception, risk tolerance, loss aversion, and investment decisions have a high level of reliability and can be used for further analysis in the PLS-SEM model.

Table 7. Result of Reliability Test

Variable	Cronbach's alpha	Composite reliability (rho_c)	Interpretation
Herding Behavior	0,902	0,916	Reliable
Investment Decision	0,864	0,898	Reliable
Loss aversion	0,891	0,917	Reliable
Overconfidence	0,909	0,932	Reliable
Risk perception	0,885	0,912	Reliable
Risk tolerance	0,899	0,923	Reliable

Source: Processed Data (2024)

Model Fit Test

The model fit evaluation results (Table 8) indicate that the Standardized Root Mean Square Residual (SRMR) value of 0.078 remains below the 0.10 threshold, suggesting that the difference between the predicted and actual covariances is relatively small. This reflects that the model has a reasonably good level of fit to the data (Hair et al., 2019). Furthermore, the d_ULS value of 4.054 and d_G of 2.588, both of which are still within the tolerance limit and do not show a significant deviation, support the conclusion that the model is in a suitable condition. Although the calculated Chi-square value of 1,714.578 exceeds the table value of 49.803, indicating a statistically significant model misfit, this test is known to be highly sensitive to large sample sizes. Therefore, its interpretation needs to be adjusted in consideration of other indicators. The NFI value of 0.623, although not yet equal to the ideal value (1), still indicates that the model has an acceptable level of fit.

Table 8. Result of Fit Test

Parameter	Estimated model	Interpretation
SRMR	0,078	Fit
d_ULS	4,054	Fit
d_G	2,588	Fit
Chi-square	1.714,678 ≥ 49,802	Does not fit
NFI	0,623	Fit
GOF	0,486	Fit
Q ² Predictive Relevance	0,315 > 0	Fit

Source: Processed Data (2024)

Meanwhile, the Goodness of Fit (GoF) value of 0.486, which is above the threshold of 0.36, indicates that the model has a strong level of fit. Finally, the Q^2 value of 0.315, which is greater than zero, means that the model has good predictive ability. Based on all these indicators, it can be concluded that the model has met the feasibility criteria and can be used to test the relationships between variables in this study.

Inner Model

R Square (R^2)

The R-Square (R^2) value of 0.365 (Table 9) indicates that approximately 36.5% of the variation in investment decision variables can be explained by the variables included in the model, namely herding, overconfidence, risk perception, risk tolerance, and loss aversion. Meanwhile, the remaining 63.5% is explained by other factors not included in this research model. This R^2 value indicates that the model has strong explanatory power for the endogenous variables and is therefore considered worthy of further analysis.

Table 9. R Square Test (R^2)

Dependent Variable	R-square	R-square adjusted
Investment Decision	0,388	0,365

Source: Processed Data (2024)

Hypothesis Tests

The hypothesis test results (Table 10) indicate that not all independent variables significantly influence investment decisions. The herding variable has a p-value of 0.996, which is far above the 0.05 significance threshold, indicating that herding does not significantly influence investment decisions. In contrast, the overconfidence and risk perception variables have p-values of 0.000 and 0.001, respectively, which are below the 0.05 significance limit. This indicates that both variables have a significant influence on investment decisions. Meanwhile, the risk tolerance and loss aversion variables have p-values of 0.729 and 0.305, both of which are greater than 0.05. Therefore, it can be concluded that neither has a significant influence on investment decisions in this study.

Table 10. Result of Bootstrapping (Hypothesis Test)

Hypothesis	Description	P values	Interpretation
H ₁	Herding Behavior → Investment Decision	0,996	Does not influence
H ₂	Overconfidence → Investment Decision	0,000	Influence
H ₃	Risk Perception → Investment Decision	0,001	Influence
H ₄	Risk Tolerance → Investment Decision	0,729	Does not influence
H ₅	Loss Aversion → Investment Decision	0,305	Does not influence

Source: Processed Data (2024)

Discussion

Herding Behavior does not have a significant effect on stock investment decisions.

The analysis results show that herding behavior does not significantly influence stock investment decisions. This finding suggests that respondents, primarily business and accounting students, tend to make decisions based on personal considerations rather than simply following the behavior of other investors. Although some respondents feel comfortable following market trends or choosing popular stocks, this tendency is not strong enough to form a collective decision pattern. They remain independent in their choices, are not overly concerned with differing views from the majority, and do not use changes in other investors' portfolios as the primary basis for their investment strategies.

This rational behavior indicates that novice investors in this study rely more on objectively available information, particularly company fundamentals, than on emotional

market trends (Chris Setiawan, Dorkas Rambu Atahau, and Robiyanto, 2018). This is further supported by the fact that the majority of respondents were in their final semester, likely possessing sufficient academic understanding and learning experience in investment and finance. Based on the discussion, it can be concluded that herding behavior does not significantly influence investment decisions. These results support the findings of Chris Setiawan, Dorkas Rambu Atahau, and Robiyanto (2018), which stated that herding behavior does not directly influence individuals' investment decision-making processes.

Overconfidence has a significant influence on stock investment decisions.

The research results indicate that overconfidence has a significant impact on stock investment decisions. Respondents, who are predominantly Generation Z students and primarily in their final semester of business and accounting studies, demonstrated high levels of confidence in their knowledge, abilities, and experience. With relevant educational backgrounds and extensive access to digital information, they feel capable of making independent investment decisions. This attitude reflects overconfidence, where individuals tend to overestimate their abilities and underestimate risks. This finding aligns with the theory of planned behavior, which explains that excessive self-confidence can irrationally influence financial decisions (Fridana and Asandimitra, 2020). These results support the findings of Fridana and Asandimitra (2020), Adiputra (2021), and Adielyani and Mawardi (2020), which state that overconfident behavior directly influences the investment decision-making process by individuals.

Risk perception has a significant influence on stock investment decisions.

The research results indicate that risk perception has a significant influence on stock investment decisions. This finding reflects that respondents, who were predominantly Generation Z students majoring in business and accounting in their final semester, possess the ability to assess risk and perceive potential returns from their investments. Respondents felt confident that choosing investments that align with their personal risk profiles was a wise decision. They also tended to select investment instruments with a good track record and the prospect of significant returns. Optimism about potential long-term returns was a key factor in their investment decisions, as evidenced by the belief that current investments will generate substantial value in the future. This attitude aligns with prospect theory, which states that individuals in uncertain times tend to choose the option they perceive as most profitable based on perceived risk and potential returns. These results align with research by Adielyani and Mawardi (2020) and Nur Aini and Lutfi (2019), which found that risk perception directly influences individuals' investment decision-making processes.

Risk Tolerance does not affect stock investment decisions.

The research results indicate that risk tolerance does not significantly influence stock investment decisions. Although respondents stated they consider the potential for profit and loss before investing, and showed a preference for low-risk assets, this was not strong enough to directly influence investment decisions. The majority of respondents were Generation Z students majoring in business and accounting in their final semesters. With this background, they tend to be cautious and rational in assessing risk. However, in practice, their investment decisions are more influenced by other factors such as overconfidence or perceptions of potential returns, rather than solely by risk tolerance. Indicators such as a tendency to choose stable instruments, adjusting portfolios to suit risk preferences, and considering global market and economic conditions indicate risk awareness. However, this awareness is more of a passive consideration, not a dominant factor in investment decisions. The theory of planned behavior posits that attitudes, subjective norms, and perceived behavioral control collectively influence a person's decision-making. This means that even if an individual has a preference for a particular risk, an investment decision will not be made without a firm intention to act. The results of this study support the findings of Rahma (2023).

Loss aversion does not affect stock investment decisions.

The analysis results indicate that loss aversion does not significantly influence stock investment decisions. The majority of respondents in this study were Generation Z students, with a higher proportion of women than men, and most were in their final semesters, majoring in Management and Accounting. These characteristics reflect an academic group that already has a basic understanding of risk and financial decision-making. Based on the indicators, respondents demonstrated a tendency to avoid risk by considering potential losses before investing, avoiding assets with a high probability of loss, and selecting companies with a positive track record. They also admitted to conducting risk analysis before making decisions. However, although this cautious attitude was evident, it was not strong enough to significantly influence investment decisions. These findings suggest that fear of loss is not yet a primary factor influencing respondents' investment decisions. This could be due to their more dominant self-confidence or their desire to pursue profit opportunities despite the risks. Furthermore, as Generation Z students are accustomed to accessing digital information, they tend to make decisions based on a combination of data and intuition, rather than solely on fear of loss. The results of this study support those of Nur Aini and Lutfi (2019), who found that loss aversion behavior does not significantly affect the investment decision-making process of individuals.

CONCLUSIONS

This study aims to analyze the influence of psychological and behavioral factors on the investment decisions of students at Batam State Polytechnic. Based on the results of the PLS-SEM model testing on 139 respondents, several significant findings were obtained. First, only two variables were shown to have a considerable influence on investment decisions: overconfidence and risk perception. Students with high self-confidence tend to be more active in making investment decisions. Conversely, students with high-risk perceptions tend to be more cautious and avoid risky investments.

Meanwhile, the other three variables—herding behavior, risk tolerance, and loss aversion—did not significantly influence investment decisions. This suggests that students rely more on personal knowledge and logic than on following the majority's behavior, and lack sufficient sensitivity to risk and loss due to limited actual investment experience. Overall, this research model explained 36.5% of the variation in students' investment decision-making, indicating that behavioral and psychological factors do play a role, but are not completely dominant.

Based on the results of this study, it is recommended that students enhance their investment understanding and experience through practical learning such as capital market simulations, financial literacy activities, and direct involvement in simple investments. This is crucial for balancing high self-confidence with more mature rational considerations, as well as shaping more realistic risk perceptions and attitudes toward loss. Educational institutions are also expected to enrich learning methods with more applied and experience-based approaches, such as investment training, practical classes, and the involvement of resource persons from the capital market. For future research, it is recommended to expand the scope of respondents and consider additional variables such as financial literacy or emotional factors to gain a more comprehensive understanding of students' investment behavior.

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