The Impact of Psychological Factors and InvestmentKnowledge on Stock Investment Decisions Among Malang Students Using the Ajaib Application

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Abstract. This study aims to determine the influence of psychological factors and the level of investment knowledge of students in Malang on stock investment decisions through the Ajaib application. The research target is students aged 16-24 years old who invest in stocks using the application. The method used is a survey with a questionnaire as a data collection tool, with the sample taken through non-probability sampling and purposive sampling methods. Data analysis included testing the outer model (convergent validity, discriminant validity, Cronbach's Alpha, and composite reliability) and the inner model (coefficient of determination, path coefficient, and T-statistic). The results showed that psychological factors and the level of investment knowledge have a positive and significant influence on students' investment decisions. These findings emphasize the importance of financial education and psychological awareness in shaping smart investment behavior among young investors, especially through digital platforms such as Ajaib.

Keywords: Psychological Factors, Investment Knowledge Level, Investment Decision, Ajaib Application.

1. Introduction

Currently, the investment trend in the younger generation shows an increase. Based on the Financial Services Authority (OJK) report from the period 2020 to the end of 2022, there was a significant increase in the number of stock investors, from 3 million to 9.45 million investors in August 2022. Generation Z and millennials are the most eager to become new investors (OJK,2022) [1]. This data is supported by the fact that 60 percent of total investors are under the age of 30 (Fizriyani, 2023) [2]. According to Ari & Purwohandoko (2019) [3], currently stock investment is one of the instruments that is increasingly in demand in various circles. One of the reasons for choosing stocks is stock returns because they are considered to provide more expected value than other investments. Someone has the desire to manage their money in the hope of future profits. No exception, students also want to get more money from investment.

Students' decisions in allocating their money to invest are influenced by various things. Psychological factors play an important role in investment decision making. Research by Hesniati and Hendy (2019) [4] shows that financial behavior influenced by psychological factors has a significant impact on investment decisions. Investors with high self-confidence tend to take greater risks than those with less confidence. In addition, more emotional investors

tend to make less rational decisions and are more influenced by short-term market fluctuations. In addition to psychological factors, the level of knowledge about investment is also a key variable in investment decision-making. Students who have a good understanding of stock market mechanisms, fundamental and technical analysis, and risk management tend to make wiser investment decisions. High financial literacy is positively correlated with better investment decisions and improved financial well-being.

In this case, the authors are interested in further researching the influence of financial literacy and psychological factors on the investment decisions of Malang City students in the Ajaib Application. Based on the results of research conducted by [5], the Ajaib investment platform is said to provide a better user experience and positive impact compared to Bibit. The analysis results show that Ajaib has a higher improvement curve in the categories of general user experience, ease of use, usability, and level of use. Therefore, the selection of Malang City students is based on its status as a City of Education known for its many universities and large student population. This is also in line with the slogan of Malang City, Tri Bina Cita, one of which emphasizes the goal of Malang City as a City of Education. This condition means that Malang City has a conducive environment for learning and innovation. Students in Malang City have access to various educational facilities and knowledge development that can potentially influence their preferences in investment.

According to [6], based on information gathered from various sources, the higher education landscape in Malang City in 2022 showed significant development. The city is home to around 62 higher education institutions, consisting of 5 state universities (PTN) and 57 private universities (PTS). This diversity reflects the vitality of the city's education sector. The active student population in Malang City reaches an impressive figure of around 330,000 people. This number includes both students who have just started their academic journey and those who have been studying for longer. It is a combination of all students enrolled in public and private universities in the city. These figures confirm Malang's position as one of Indonesia's important higher education centers.

This research provides an in-depth insight into the influence of psychological factors and knowledge levels on investment decisions among university students. Recognizing that university students are a relatively new segment in the investment market, understanding how these factors influence their investment decisions will be useful in developing education and support strategies for first-time investors. In addition, this research can also provide valuable information for the development of investment platforms such as Ajaib to improve user experience and help college students make better investment decisions.

This study aims to explore the influence of psychological factors and knowledge level of university students in Malang on stock investment decisions in Ajaib application. Psychological factors, such as motivation, self-confidence, and risk perception, can influence college students' interest in investing; individuals with high investment knowledge tend to be more confident in making decisions. In addition, students' level of knowledge about investment plays a significant role in their investment decisions, where a good understanding of investment products, risk management, and investment strategies can encourage active participation in the stock market. Thus, this study aims to provide insight into how these two aspects can influence students' investment decisions in the context of using the Ajaib application as an investment platform.

2. Literature Review

Theory is logical reasoning consisting of a series of concepts, definitions, and propositions arranged systematically [7].

Psychological Factor

Psychological factors refer to variables related to an individual's thoughts, feelings, and behaviors that affect the way the individual interacts with the surrounding world. Allport defines psychology as "the thoughts, feelings, and behaviors of individuals that are affected by the direct, imagined, or indirect presence of others". Psychological factors can include things such as an individual's motivations, emotions, perceptions, beliefs, values and experiences. In a broader context, psychological factors can also include factors such as stress, anxiety, depression, and other factors that affect one's mental well-being.

Kotler in Susanto (2005: 215) states that there are four main psychological elements that influence a person's decision including the following [8]:

1. Motivation. Motivation is an internal drive that encourages a person to achieve a goal or take an action.
2. Perception. According to Kotler (2005: 216), "perception is the process used by an individual to select, organize, and interpret input information to create a meaningful picture of the world". Perception not only depends on physical stimuli, but also depends on the environment and the state of the individual concerned.
3. Learning. Learning theory teaches marketers that they can increase demand for products by linking them to strong prompts, using motivational cues, and providing positive reinforcement.
4. Beliefs and Attitudes. Beliefs are mental representations that a person believes about something and attitudes are a person's ongoing judgments, emotional feelings, and action tendencies towards certain objects or ideas, whether they are perceived favorably or unfavorably [8].

Knowledge

According to Notoatmodjo in Rinawati, et al. (2003), The "knowing" process that takes place when a person detects an object is what leads to knowledge. The senses of sight, hearing, smell, taste, and touch are the five senses through which this sensing takes place. The majority of human information is acquired by sight and hearing. Notoatmodjo (2003) asserts that knowledge plays a crucial role in determining an individual's behavior, and that there are six degrees of knowledge in the cognitive domain, including [9]:

1. "Know", which means remembering information that has been previously learned. This level includes the ability to recall specific information from the material learned or stimulus received, which is the most basic level of knowledge.
2. "Understand" (comprehension), which means the ability to explain and interpret information correctly.
3. "Application", which means the ability to use the learned information in real situations or conditions.
4. "Analysis", which is the ability to explain an object or material into components, but still within the same organizational structure and still interrelated.
5. "Synthesis", which shows the ability to connect parts into a new whole.
6. "Evaluation", which relates to the ability to assess or criticize a material or object [9].

Investment Decision

Investment is money invested by a business into an asset with the intention of earning

income from that asset in the future. Meanwhile, investment decisions are the idea of the time value of money becomes important to consider if the investment is made for the long term. This decision is based on an analysis of the risks and potential returns of investments made by investors or companies. A person's decision-making process when making investments is influenced by a number of elements. First, the primary incentive for investing is return. Second is risk, where the higher the expected return on investment, the higher the risk. Third, a linear or unidirectional relationship between return and risk is anticipated [10].

Although each investor has a varied level of ability and understanding, the information gathered and the investor's knowledge about investments will both have a significant impact on the decisions made regarding investments. Investment decision-makers don't always act in a way that aligns with the presumptions reached based on how they perceive and comprehend the information they are given. How Investors Act in the Capital Market The capital market is home to a wide range of investors. Several factors, including purchasing capacity for securities, degree of investment knowledge and experience, investment behavior, and investment motivation, all contribute to this variation. Due to this variability, there are variances in the degree of assurance, as well as in the expected return andrisk, from investing operations [10].

Share

Shares are a form of ownership of the company. Dividends or capital gains will be obtained if someone has ownership of the shares of a company going public. Another definition of shares is proof of taking part or participating in a limited liability company [11]. In general, shares are securities that are issued by a corporation in the form of a limited liability company, also known as the issuer, which declares who owns the shares. As a result, the purchase of shares makes the buyer the owner of the business. This investment activity is generally coordinated by an institution, namely the stock exchange, which is always supervised by BAPEPAM in its activities [12].

Previous research is an attempt to compare previous studies and seek new inspiration for future research. In addition, this literature review helps to position the research and show its originality. This section includes various previous research results, both published and unpublished, relevant to the topic to be studied. The following are previous studies and differences that have supported this research.

1) Research written by Hesniati and Hendy (2021) with the title "Pengaruh Perilaku Keuangan Terhadap Keputusan Investasi." and published by the Research and Community Service Center [13]. The changes made by researchers are in the object of research, in this case changing the object of mutual fund investors domiciled in thecity of Batam to student magic application stock investors in Malang. The next difference lies in the theory used. In the research of Hesniati and Hendy (2021) there are heuristic theory, herding theory, and prospect theory, while in this study using psychological factor theory, investment knowledge level theory, and investment decision theory.

2) Research written by Fatatun Malihah (2022) entitled "Pengaruh Literasi Keuangan Syariah Terhadap Minat Investasi Syariah Melalui Aplikasi Ajaib (Studi Kasus: Generasi Z Daerah Istimewa Yogyakarta)." [14]. The change made by the researcher is in the research target, in this case changing the research target of Generation Z of the Special Region of Yogyakarta to Malang Students. The next difference is in the object under study, namely sharia investment through the magic application to magical application stock investment.

3) Research written by Muhammad Danang Mahardhika and Nadia Asandimitra (2023) entitled "Pengaruh overconfidence, risk tolerance, return, financial literacy, financial

technology terhadap keputusan investasi yang dilakukan mahasiswa Surabaya" published in the E-Journal of Management Science, University of Surabaya [15]. Changes were made by researchers to the research target, in this case changing the target of Surabaya students to Malang students. The next difference lies in the indicators used. In the research of Muhammad Danang Mahardhika and Nadia Asandimitra (2023) on financial literacy theory, namely indicators of basic financial knowledge, credit management, savings, investment and insurance (2020), while in this study using indicators of general knowledge about investing in the capital marketand knowledge of the rate of return.There are also differences in the indicators used in the theory of investment decisions. In the research of Muhammad Danang Mahardhika and Nadia Asandimitra (2023) on investment decision theory, there are four indicators, namely firmimage, neutral information, accountant information and personal financial needs (2009), while in this study there are rates of return, investment risk (risk), and decision making.
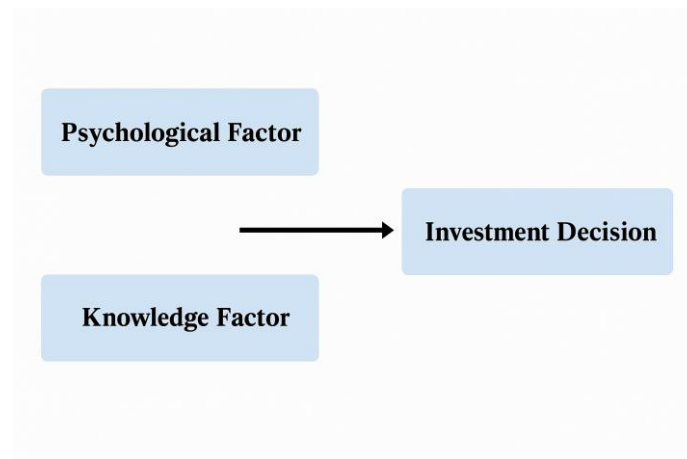
Research Conceptual Framework

Figure 1. Conceptual Framework
Source: Author's Own Analysis
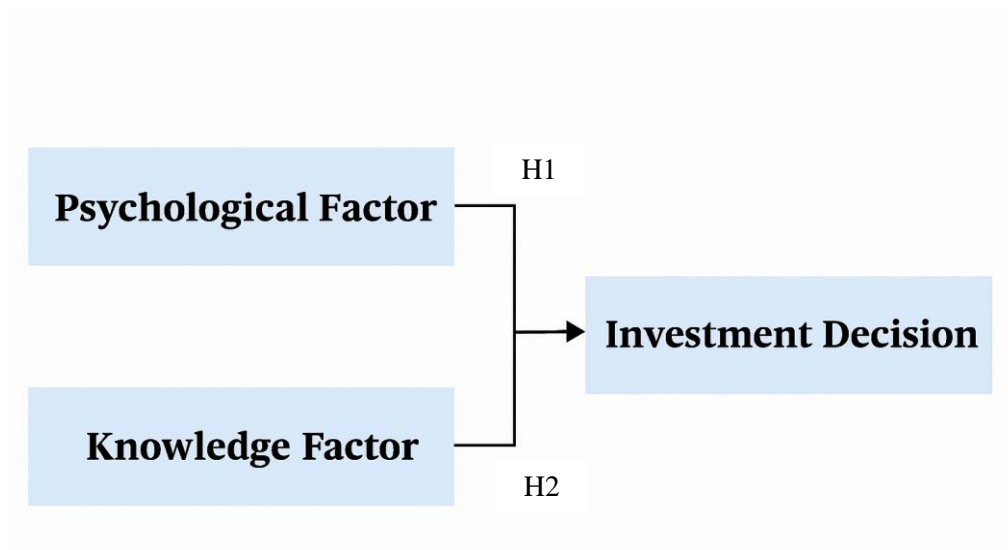
Research Hypothesis

Figure 2. Conceptual Framework
Source: Author's Own Analysis

H1 = The influence of psychological factors on investment decisions H2 = The effect of knowledge level on investment decisions

3. Research Methodology

The study employed a quantitative research design to examine the influence of psychological factors and the level of knowledge on stock investment decisions among students in Malang using the Ajaib app. Descriptive quantitative research was utilized to identify and explore potential relationships between these variables [16, 17]. Data were collected through an explanatory survey, which helps establish causality [18]. A closed questionnaire using a five-point Likert scale was distributed, with responses ranging from "strongly disagree" to "strongly agree" [19].

The research was conducted among student stock investors in Malang City, chosen for itssignificant student population and focus on education. This location was selected to provide insights that could support financial management awareness among students [19]. The independent variables in this study were psychological factors and level of knowledge, while the dependent variable was stock investment decisions [7]. A Likert scale was used to measure these variables, combining multiple items to reflect individual traits such as knowledge and attitudes. Respondents indicated their agreement with each statement by selecting one of the available options [20].

Table 1. Researcher Processed Data

No.	Respondent's Answer	Score
1.	Strongly Agree	5
2.	Agree	4
3.	Neutral	3
4.	Disagree	2
5.	Strongly disagree	1

Source: Researchers' processed data (2024)

The operational definition of a variable characterizes a research object based on specific criteria established by the researcher to facilitate data collection and ensure consistency [7]. The operational definitions of variables in this study are summarized in a table for clarity. The population for this research consisted of students engaged in stock investment in Malang City, East Java. This population was selected to investigate the influence of psychological factors and the level of knowledge on stock investment decisions [17]. For the sample, we employed a non-probability sampling technique using purposive sampling, targeting student stock investors utilizing the Ajaib application in Malang City [7]. Given the difficulty in determining the exact number of students using the Ajaib application, the Malhotra formula was utilized to establish an appropriate sample size.

Malhotra's formula:
$$N = 4 \text{ or } 5 \times n$$
N = number of respondents n = number of items

Calculated result:
$$N = 5 \times 24 = 120$$

Based on the sample calculation formula above, the number of respondents to be sampled in this study were 120 respondents. Data collection is a crucial step in research, aiming to obtain accurate data (2012). The techniques utilized in this study include observation, interviews, and questionnaires. Primary data was collected through direct surveys of students in Malang City who are involved in stock investment. The primary data was gathered using a structured questionnaire, allowing participants to provide their responses. This method is effective when the researcher has a clear understanding of the variables and possible responses. Secondary data supporting this research included documents, books, journals, and previous research findings [17].

The analysis employed the Structural Equation Model (SEM) using the Partial Least Square (PLS) approach, utilizing SmartPLS 3.0 for hypothesis testing. SEM is a robust statistical technique that integrates path and factor analysis. It handles interactions, correlations, measurement errors, and multiple latent variables, as explained by [20]. The evaluation of the measurement model focused on validity and reliability, emphasizing convergent validity. This ensures that indicators of a construct show a high correlation with each other, according to [21]. The structural model describes the interconnections among constructs based on theoretical assumptions. Evaluation involves checking for collinearity and predictive ability, using criteria such as the coefficient of determination (R^2) and path coefficients. The R^2 value indicates the explanatory power of endogenous constructs, while path coefficients assess the strength and significance of relationships between constructs, as stated by [22].

4. Research Results

This study's overview of respondents, consisting of student stock investors in Malang City, involves 120 participants. The criteria for respondents are classified based on gender and age.

Table 2. Gender and Ages

Information		Frequency	Percent
Gender	Male	47	39.2
	Female	73	60.8
Ages	16-17	3	2.5
	18-19	55	45.8
	20-21	49	40.8
	22-23	13	10.8

Source: Author's Analysis

Based on the collected data, a total of 120 students responded, with a percentage of males at 39.2% and females at 76.8%. Therefore, it can be concluded that the respondents are predominantly female, totaling 73 individuals, while male respondents number only 47. Whereas the data reveals that there is 1 respondent aged 16 years (0.9%), 2 respondents aged 17 years (1.7%), 16 respondents aged 18 years (13.3%), 39 respondents aged 19 years (32.5%), 33 respondents aged 20 years (27.5%), 16 respondents aged 21 years (13.3%), 10 respondents aged 22 years (8.3%), and 3 respondents aged 23 years (2.5%). It can be concluded that the majority of respondents are 19 years old, totaling 39 individuals or 32.5%.

The research location is the place where the researcher conducts the study to obtain the necessary data to solve the research problem. In this study, the researcher specifically conducted the research in Malang City. The reason for choosing this location is that Malang City has a Tri-Bina Citra, one of which focuses on positioning the city as an educationalhub. Since Malang has a large number of students and university attendees, as well as being anindustrial and tourism city, it is expected that this research will lead to policies, particularly related to investment, that can help students become more financially literate. By involving students in this research, it is hoped that investment policies will be more focused and relevantto the needs of the Malang City community.

This research model consists of three constructs, namely psychological factors (X1), level of knowledge (X2), and investment decisions (Y). The validity and reliability of a construct can be assessed using a measurement model. Based on the results of convergent validity from the outer loading values, several items were found to be invalid. Therefore, the author eliminated the invalid items, resulting in valid loading factor values (Figure 3). The following is a path diagram model in this study:
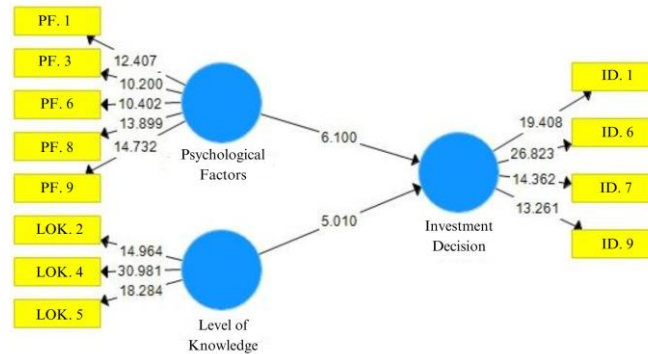
Figure 3. Path Diagram
Source: Author's Analysis

The Outer Model, or measurement model, is used to assess the validity and reliability of the research model. According to Abdullah (2015), validity testing ensures that the research instruments measure the intended variables accurately [23]. In this study, the validity was examined through convergent validity, which relies on the principle that a construct's indicators (manifest variables) should show strong correlations. For reliability, the researcher utilized Cronbach's Alpha and Composite Reliability tests to ensure that the instruments are accurate, consistent, and precise when measuring latent variables.

Based on the AVE values in Table 3, the items for the research variables are deemed valid. This conclusion comes from the Convergent Validity test, where loading values around 0.5 to 0.6 are still considered acceptable [24]. Furthermore, Cronbach's alpha values for the psychological factors variable (X1) is 0.768, for the investment decision variable (Y) is 0.787, and for the level of knowledge variable (X2) is 0.724, all exceeding the threshold of >0.7, indicating their validity. The Composite Reliability was also analyzed and confirmed as valid, with Psychological Factors (FP), Investment Decision (KI), and Level of Knowledge (TI) each showing values of 0.843, 0.863, and 0.843, respectively.

Table 3. AVE, Cronbach's Alpha, Composite Reliability

	Average Variance Extracted (AVE)	Cronbach's Alpha	Composite Reliability
PF (Psychological Factors)	0.517	0.768	0.768
ID (InvestmentDecision)	0.611	0.787	0.787
LOK (Level of Knowledge)	0.642	0.724	0.724

Source: Author's Analysis

The assessment of the R-Square Model (R^2) in this study aims to measure the extent to which independent variables affect the dependent variable. The results of the R-Square assessment, conducted using SmartPLS 4, are presented in the following table:

Table 4. Coefficient of Determination / R-Square Model

	R Square	R Square Adjusted
ID	0.576	0.569

Source: Author's Analysis

From the R-Square data above, it can be concluded that the R-Square for KI is 0.569. This indicates that psychological factors and knowledge level variables have an influence on investment decisions amounting to 50.69%. The remaining 49.31% represents the percentage influenced by other variables outside this study.

Table 5. T-Statistics / Bootstrapping

	Original Sample	Standard deviation (STDEV)	T. Statistics	P Values
PF->ID	0.447	0.456	5.569	0.000
LOK->ID	0.399	0.396	4.799	0.000

Source: Author's Analysis

According to the criteria for path coefficient analysis, if the relationship between variables is less than 0, it is considered negative, while values greater than 0 indicate a positive relationship. Based on the original sample data, where the values are predominantly above 0, it can be concluded that both psychological factors and knowledge level positively influence investment decisions. Therefore, it is evident that there is a positive and significant relationship between psychological factors, knowledge level, and investment decisions.

The T-Statistics/Bootstrapping criterion is used to assess the significance of relationships between variables, where a T-Statistic value greater than 1.96 signifies a significant relationship, and a value below 1.96 indicates an insignificant effect [25]. Based on the data, all T-Statistic values are above 1.96, demonstrating that bothpsychological factors and knowledge level have a significant impact on investment decisions.

Discussion and Data Interpretation

Based on the results of testing H1, it was found that psychological factors have a positive and significant influence on investment decisions. This finding indicates that thebetter the psychological factors of students, the higher the likelihood that they will make investment decisions. This aligns with previous research by Hesniati and Hendy (2021) [26], which showed that financial behavior, including overconfidence, affects investment decisions. Barros and Silveira (2009) [27], define overconfidence as an individual's level of self-confidence in making policy decisions based on the information available in the context of investments. Their study demonstrated that overconfidence positively influences investmentdecisions. Investors who exhibit high levels of overconfidence and optimism tend to make larger investments. Additionally, herding behavior also has a significant impact on investment decisions. Kumar and Goyal (2016) [28] concluded that herding significantly and positively influences investment decisions. This influence arises from the sharing of information among investors, where some investors, uncertain about the information they possess, seek opinions from others. The information obtained from peers is then used as a consideration in making investment decisions.

The results of testing H2 indicate that knowledge level has a positive and significant influence on investment decisions. This means that the better the level of knowledge among students, the greater the likelihood that they will enhance their investment decisions. This is in line with the research of Ardani and Sulindawati (2021) [29] that investment knowledge has a significant positive impact on an individual's interest in investing. Investment knowledge encompasses an understanding of capital markets, various available investment instruments, as well as the associated risks and potential returns. Investment requires adequate knowledge to select instruments that can yield optimal results while considering risk. Therefore, having sufficient investment knowledge is crucial as it can assist students in making better investment decisions, understanding risks and returns, and selecting appropriate investment instruments.

5. Conclusion

Based on the discussion and interpretation of the data, it can be concluded that students in Malang will decide to invest based on their understanding and confidence about investing, especially through the Ajaib application. Based on the hypothesis above, which states:
1. The results of testing H1 show that psychological factors have a positive and significant impact on investment decisions. This suggests that the stronger the psychological factors of students, the greater the probability of them making investment decisions.
2. The results of testing H2 show that the level of knowledge has a positive and significant influence on investment decisions. That is, the better the level of knowledge of college students, the more likely they are to increase their investment decisions.

Based on the results of hypothesis testing above, it states that both hypotheses affect the decision of students in Malang to invest, especially through the Ajaib application.

The results of the study entitled "The Effect of Psychological Factors and the Level of Knowledge of Students in Malang on Stock Investment Decisions in the Magic App" are expected to make practical and theoretical contributions to various parties in the form of concrete suggestions that can be applied in the future, namely:
1. For future researchers, it is recommended to consider adding other variables that can influence investment decisions, such as the influence of the social environment, access to information, or previous investment experience. This can provide a more comprehensive picture of the factors that influence student investment decisions.
2. Students should continue to improve their financial knowledge and literacy, especially related to investment. Attending seminars, reading books or articles on investment, and utilizing available educational resources can help them make wiser investment decisions. In addition, students need to be wise when using investment applications. Before making investment decisions, it is advisable to always conduct in-depth research, consider various factors, and not rush to follow trends without sufficient understanding.

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Appendix

Operational Definition of Variables

Variables	Indicator	Item
Psychological Factors(X1)	Overconfidence	1. Excellent business capabilities motivate me to invest 2. I keep investing despite the risks involved 3. Expertise in this type of business prompted me to make the investment.
	Herding Behavior	1. Other investors' decisions influence my investment decisions 2. I consider information from friends or coworkers more reliable 3. I am motivated to make investments when others are making new investments.
	Optimistic	1. I easily adjust when financial problems occur 2. If I incur a loss, I will make a profit quickly 3. I can usually predict market trends.
Investment Knowledge Level (X2)	General knowledge of capital market investment	1. I feel basic knowledge about investment is important 2. Capital market school helps me to increase my investment knowledge 3. I understand investment knowledge before making an investment.
	Rate of return knowledge	1. I invest in companies that provide

		high returns
		2. I take into account the benefits before choosing a company to invest in.
		3. I invested with the expectation of compounded returns.
Investment Decision (Y)	Rate of Return	1. I prioritize the investment return of the investment product I choose 2. I will choose an investment level with a high rate of return even if the risk is also high 3. Compared to other investments, my investments provide more dividends.
	Investment Risk	1. I learn about the risks before making investment choices. 2. My stock investments have a very high level of security 3. I regularly evaluate the performance of my portfolio.
	Decision Making	1. I invest in the capital market with careful calculation 2. I try to find important information from various parties to know the investment decision that I will receive 3. I invest in the capital market by considering the benefits and risks that I will receive.