

THE INFLUENCE OF PSYCHOLOGICAL FACTORS ON STOCK INVESTMENT DECISIONS AMONG MILLENNIALS

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Abstract. Investment is the process of allocating capital or funds with the expectation of earning profits in the future. Psychological factors are of significant importance in the realm of investment decision making. A person may be influenced by psychological factors to make irrational investment decisions, which could cause a deviation from the desired level of risk and return as estimated by the investor. As a result, there is a need for a comprehensive examination of the psychological variables that can impact investment decision-making. Cognitive dissonance, herding, illusion of control, emotion, and overconfidence are the five variables examined in this research. The relationship between psychological factors and investment decision making can be predicted using the Partial Least Square-Structural Equation Modeling (PLS-SEM) technique. The conclusion that the variables illusion of control, emotion, and overconfidence have a significant impact on investment decision making is supported by the PLS-SEM method's effective application in analyzing the influence of psychology on investment decision making. In the context of investment decisions, cognitive dissonance and herding variables exhibit negligible influence. Additionally, the predictive relevance value acquired in this research is greater than zero, suggesting that the variables and data effectively forecast the model with respect to the present state of affairs.

Keywords: investment psychology; millennial generations; PLS-SEM; illusion of control; emotion; overconfidence

I. INTRODUCTION

Investment is the process of allocating capital or funds with the expectation of earning profits in the future. Individuals who engage in investment activities are referred to as investors. Stocks are considered an investment asset. Investment outcomes can be significantly influenced by two critical elements: comprehensive stock analysis and a developed psychological state [1]–[4]. The valuation of stocks can be anticipated through the implementation of technical and fundamental analysis. Technical analysis is heavily reliant on stock data from the previous period. By utilizing this historical data, one can make estimations about the value that will be observed in the subsequent period. This estimation can be achieved through various means, including data processing, examination of market patterns, or forecasting [5]–[7]. In contrast to what fundamental analysis posits. Fundamental analysis entails evaluating the most recent stock-related information to determine whether it is potentially beneficial or detrimental to the stock [8]–[11]. In addition to comprehensive analysis, the psychology of investors is a significant determinant in shaping investment decisions. Psychological factors are of significant importance when it comes to investment decision-making. A person may make irrational decisions in response to psychological factors,

which may cause them to deviate from the desired level of risk and profit as estimated by investors. Hence, for optimal outcomes, investors must possess the ability to regulate their psychological state during the process of purchasing and selling securities. Illusion of control, emotion, overconfidence, cognitive dissonance, and herding are five significant variables that can influence investment behavior. Illusion of control is characterized by an excessively optimistic prediction of an outcome [12], [13]. Emotion is a psychological state that significantly influences cognitive processes, including learning, memory, and decision-making. Overconfidence is a psychological state characterized by an excessive belief in one's own capabilities or expertise with regard to investment decision-making [14]–[16]. Cognitive dissonance is a psychological state characterized by an imbalance wherein the newly acquired information fails to align with the previously accepted comprehension [17]–[19]. Herding refers to the tendency of individuals to engage in a particular activity without first undertaking an analysis, which leads to suboptimal decision-making [20].

The relationship between psychological factors and investment decision making can be predicted using the Partial Least Square-Structural Equation Modeling (PLS-SEM) technique. This PLS-SEM technique is appropriate for forecasting the correlation between dependent and

independent variables. PLS-SEM has the capability to analyze both small and large (dynamic) samples, processes data without requiring prior normalization, and is applicable to complex hierarchical research [21]. Psychological influences on investment decision making with the PLS-SEM model, among others, by [17], who studied cognitive dissonance bias, overconfidence bias, and herding bias in State University of Padang Faculty of Economics students and found that the herding variable has a significant effect. [22] Studied the effects of herding, overconfidence, and personal financial needs on investment decision making in Pekanbaru accounting study program students and found that herding has a significant effect. Research by [23] found that optimism, overconfidence, conservatism, and availability bias affect investment decision making in investors in the Special Region of Yogyakarta Province. [24] Studied the effects of overconfidence bias and optimism bias on investment decision making with Capital Market Study Group (KSPM) members and found that they are significant. Another study [25] found that illusion of control, overconfidence, and emotions affect investment decision making in young investors in Makassar City. Overall, the study found that PLS-SEM psychological analysis can yield varied results depending on the subject.

Based on the above understanding, this research aims to implement the PLS-SEM method in analyzing the influence of psychology on investment decision making, which later the results of this psychological analysis will be published in the hope that it can be useful for investors to find out things that can influence investment decision making based on existing research analysis.

II. RESEARCH METHODS

The type of research used in this research is descriptive analysis research, in the form of case studies predicting the link between psychology and investment decision making. This research uses main data from respondents who answered research questionnaires which were distributed to several investment groups on Facebook social media and distributed to the general public who are still active in carrying out stock investment activities. The number of respondents obtained was 97 respondents.

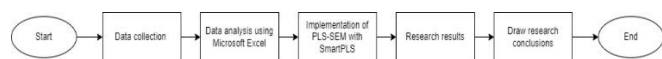


Figure 1. Research Stage

Research stages are a series of initial processes in a research. This research starts from an initial study, namely understanding the problems that exist in the research. Next, look for respondent data by giving questionnaires to several investment groups until the respondent data is obtained according to the target. After the data is collected, the data is first managed using Microsoft Excel software and then saved using comma delimited format. Then, the data in comma delimited format is processed using SmartPLS 3 software to produce research output, namely the relationship between the

dependent variable and the independent variable. The final stage of this research is drawing conclusions from the research that has been carried out. In this research, data analysis was carried out using the PLS-SEM method with the help of SmartPLS 3 software. The following are the steps for implementing the PLS-SEM method.



Figure 2. Flowchart of PLS-SEM Procedure

In this research, the Partial Least Square-Structural Equation Modeling (PLS-SEM) method was carried out through several stages, including:

1. Import Data: The first step to take when analyzing data in SmartPLS 3 is to import data. Importing data into SmartPLS can be done by double clicking on the PLS project, then selecting the dataset in comma delimited (.csv) format.
2. Conceptual Framework: After importing the data, then create a conceptual framework for each variable in the dataset using the "New Path Model" feature, then set the path between latent variables and enter all the indicators that explain the variable.
3. Measurement Model Test: At this stage, several tests are carried out, including convergent validity test, discriminant validity test, and reliability test. The convergent validity test aims to determine the validity of each relationship between the indicator and the construct or latent variable [15], [26], [27]. Reliability testing is a tool used to measure the consistency of questionnaires which are indicators of variables or constructs [16]. The discriminant test is used to ensure that the correlation of the observed variables with the construct is higher than with other constructs [28]–[31].

Structural Model Test: At this stage, several tests are carried out, including the r-squared test, predictive relevance test, and path coefficient. The r-squared test is a test to explain the proportion of variation in the dependent variable that is explained by the independent variable [28]. The predictive relevance test is a test to test the ability of variables to predict the model. The path coefficient test is the most important stage in PLS analysis because the results of the path coefficient test will be used to prove whether the hypothesis for each variable that has been determined can be accepted or rejected [32].

III. RESULTS AND DISCUSSION

Based on the results of the analysis that has been carried out using SmartPLS software, information regarding the results of the analysis can be obtained so that it can provide a clearer picture of the influence that occurs between the variables in the research. The variables tested were illusion of control, overconfidence, emotion, cognitive dissonance, and herding as independent variables and investment decisions as the dependent variable.

Table 1. PLS-SEM Results

	<i>P Values</i>	Information
<i>Cognitive Dissonance</i> (X4) => Investment Decision (Y)	0.747	Hypothesis Rejected
<i>Emotions</i> (X3) => Investment Decision (Y)	0.004	Hypothesis Accepted
<i>Herding</i> (X5) => Investment Decision (Y)	0.596	Hypothesis Rejected
<i>Illusion of Control</i> (X1) => Investment Decision (Y)	0.013	Hypothesis Accepted
<i>Overconfidence</i> (X2) => Investment Decision (Y)	0.039	Hypothesis Accepted

The following is a discussion of the results of processing investment psychology data using SmartPLS 3 software.

1. The influence of the illusion of control on investment decisions

The results of the first hypothesis (H1) can be seen in table 11, where the results of the path coefficient test show that the significance value of the illusion of control variable is 0.013 or it can be said that this value is smaller than the hypothesis test of 0.05, which means that the illusion of control variable has a significant effect on Investment decision. This indicates that if an investor's illusion of control is high, they will make investment decisions more often. Based on the test results, it shows that under certain conditions, investors often use intuition and have great confidence in determining an outcome. When an investor receives two different pieces of information, this illusion of control can help them make the best decision based on the beliefs they have. However, this illusion of control can also be a double-edged sword if an investor makes investment decisions without prior analysis. Therefore, the results of this research can be used as a reference for investors as a basis for knowledge so that they are more careful when making investment decisions. This is in line with the results of research conducted by [25], [33]who found the results that the illusion of control influences investment decisions.

2. The effect of overconfidence on investment decisions

The results of the second hypothesis (H2) can be seen in table 11, where the results of the path coefficient test show the significance value of the overconfidence variable is 0.039 or it could be said that this value is smaller than the hypothesis test of 0.05, which means that the overconfidence variable has a significant effect on investment decisions. This means that if investors have high overconfidence, investors will make investment decisions more often. Even though investors' knowledge is limited, they are overconfident and always think their decisions will be right. They trust their ability to manage their own funds more than investing through the help of others. This shows that investors who are overconfident tend to have an optimistic view of the trades they make. The high or low level of investor overconfidence can influence investment decision making. An investor with a high level of overconfidence will be bolder in making investment decisions. Vice versa, investors with low overconfidence tend to be very careful in making decisions. The results of this research are in line with

research conducted by [20], [25]who found the results that overconfidence influences investment decisions.

3. The influence of emotion on investment decisions

The results of the third hypothesis (H3) can be seen in table 11, where the results of the path coefficient test show the significance value of the emotion variable is 0.004 or it could be said that this value is smaller than the hypothesis test of 0.05, which means that the emotion variable has a significant effect on investment decisions. This means that if emotions are higher, investors will make investment decisions more often. These factors are related to the presence of good emotions (good mood) and bad emotions (bad mood) which influence investors' decisions in investing in the capital market. If investors are in an emotional state of good mood then they can invest their funds appropriately and well. However, on the other hand, if investors are in a bad mood, investors will tend to look for information that supports the actions or opinions they already have and will ignore information that does not match their beliefs. The results of this research are in line with research conducted by [25] which obtained the results that emotions influence investment decision making.

4. The influence of cognitive dissonance on investment decisions

The results of the fourth hypothesis (H4) can be seen in table 11, where the results of the path coefficient test show that the significance value of the cognitive dissonance variable is 0.747 or it can be said that this value is greater than the hypothesis test of 0.05, which means that the cognitive dissonance variable has no significant effect on the decision. investment. This shows that some investors do not always rely on their cognitive abilities and investors do not base themselves on the initial information obtained so that investors do not hesitate to receive new information from other parties. In this way, investors will receive information rationally and carry out analysis if the information they receive does not match expectations. These results support research conducted by [20] where investors are not influenced by the cognitive dissonance variable in making investment decisions.

5. The influence of hearing on investment decisions

The results of the fifth hypothesis (H5) can be seen in table 11, where the results of the path coefficient test show the significance value of the herding variable is 0.596 or it could be said that this value is greater than the hypothesis test of 0.05, which means the herding variable has no significant effect on investment decisions. These results indicate that investors tend to receive information and carry out analysis first to choose shares. Investors tend to think rationally because they are not influenced by other investors and do not follow the noise that occurs in the market, so investors can make the best decisions according to the analysis that has been carried out. These results are in line with research [20] where the herding variable has no significant effect on investment decisions.

IV. CONCLUSION

The study employed the PLS-SEM method and the SmartPLS 3 software to analyze the impact of investor psychology on investment decisions. The findings revealed that, according to the number of respondents who completed the research questionnaire, three variables emotion, illusion of control, and overconfidence have an influence on investment decisions. In contrast, the two additional variables that were assessed, specifically herding and cognitive dissonance, were discarded due to their final p-values failing to satisfy the path coefficient model test criteria or surpassing the 5% alpha value. The utilization of SmartPLS 3 software to analyze the impact of investor psychology on investment decisions through the PLS-SEM method yields a pre-dispositive relevance test value exceeding 0. This value signifies that the variables and data employed in the research effectively forecast the model's behavior in accordance with real-world occurrences.

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