



Moderating Effect of Demographic Factors on The Influence of Cognitive Bias on Investment Decisions

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Abstract. In investment decisions, several things need to be considered, especially cognitive biases which influence investment decisions because cognitive bias is a psychological phenomenon that influences financial behavior in stock players (practitioners) and how humans behave in determining actual finances in financial arrangements. Besides that, it is also a description of how humans take action in the decision-making process from the information they obtain and influence financial behavior based on emotional factors. Then, the decision-making process carried out by a person is no longer entirely rational. Apart from that, an investment decision is a sacrifice of current value that is certain for a future value that may not even be certain. The investment contains elements of expected return and risk due to uncertainty in the future, and in investment, there is a term, namely high risk - high return.

Keywords: Cognitive Bias, Demographic Factors, Investment Decisions.

1 Introduction

The rapid development in the current era of globalization requires insight and knowledge about careful and precise financial management. Every individual must have sufficient ability and knowledge to manage their finances and wealth [1].

Financial behavior studies how psychological phenomena influence financial behavior in stock players (practitioners) and how humans behave in financial decisions and arrangements. Besides that, it is also a description of how humans take action in the decision-making process from the information they obtain and influence financial behavior based on emotional factors so that the decision-making carried out by a person is no longer complete [1]. Financial behavior is a science that studies human attitudes and reactions to information presented to produce decisions that provide optimal returns and face minimal risk (elements of human attitudes and actions determine investment decisions) [2].

Based on demographic factors, there are differences between several countries, which cultural differences and understanding of investing may cause. Therefore, there is an influence of cognitive bias on gender and age, which is moderated by education and income [3].

Prospect theory explains that individuals making decisions are in various alternative situations, including risks, results, and uncertainty. Besides prospect theory, heuristic theory can help make decisions in complex environments. According to heuristic analysis, it is a shortcut that simplifies the complex methods of probability and value needed to make decisions. Although heuristics can help solve problems and speed up the decision-making process, heuristics can lead to inaccurate judgments, often ignoring relevant information and creating stereotypical categorizations that are not in line with reality [3-5].

In Investment Decisions, investors can analyze in several ways, including thinking constructively about what is essential regarding the relative priorities of future aspirations and then planning and preparing themselves for possible risks. Therefore, the investment decisions of individual investors can affect stock prices, and the amount of trading volume in the capital market from time to time shows rapid progress. As stated by the Financial Services Authority (OJK), the Indonesian capital market has now developed into one of the attractive investment destinations for investors both from within and outside the country. It has also become one of the sources of long-term funding for the business world [6].

Another measure of progress in the Indonesian capital market can be seen from the development of the performance of the Composite Stock Price Index (IHSG), which shows the rise and fall of the composite stock price index (IHSG) due to the ups and downs of the economy and investor confidence in the capital market [7].

Most investors should not invest all their funds in one type of stock, but they diversify their stocks to reduce the risk that will occur. Every investor will face various kinds of securities with different risk levels when investing in the capital market. Stocks are one of the securities among other securities that have a high level of risk. Even though securities have high risks, the returns that will be obtained do not have certainty for the future. Still, from the factors above, there is a possibility that individual investment decisions can be measured and examined. There is a possibility that the most dominant factors can influence investment decisions so that they can provide an overview of making profitable decisions by combining behavioral finance theory or behavioral finance and prospect theory and heuristics [6].

Research on cognitive bias, represented by herding bias loss aversion, framing, anchoring, mental accounting, and cognitive factors, is the initial psychological factor entering the financial world. Investment decisions made by investors are decisions that can overcome bias. Investment decisions following investor satisfaction and desires are expected to occur if risk calculations, quality information sources, investment objectives, and investment efficiency are supported [8].

By looking at the pattern of differences in age, gender, education, income, and investment, the relationship is hoped to be stronger in overcoming financial behavior. This is expected to overcome the bias of errors in making decisions based on financial behavior and the influence of cognitive bias, namely Herding, loss Aversion, Framing, Anchoring, and Mental Accounting on investment decisions in individual investor groups [9].

2 Methods

This study uses a survey exploration method, a research method that uses a population. The data used is a population sample so that descriptions and relationships between variables are found. This method is limited to a sample survey that aims to test the hypothesis formulated using a questionnaire containing questions from the variables studied. Then, the questionnaire is distributed to all individual investors. In addition, data processing is analyzed using multiple linear regression, and the moderation-moderation model is tested in the PROCESS Procedure in SPSS Version 4.1 from Hayes. It is analyzed using multiple linear regression, and the moderation-moderation model is tested in the PROCESS Procedure in SPSS Version 4.1 from Hayes.

3 Results and Discussion

3.1 Results

By looking at the pattern of differences in age, gender, education, income, and investment, the relationship is hoped to be stronger in overcoming financial behavior. This is expected to overcome the bias of errors in making decisions [8]. Based on empirical studies, the phenomena that occur in individual investors show that there are still differences in financial behavior toward investment decisions [8]. There is an interaction between cognitive bias and demographic factors based on gender and age after being moderated by education and income on investment decisions [9].

Behavioral finance in Indonesia is still influenced by behavioral financial bias, which has an impact on investment decisions, even for experienced investors in the Indonesian capital market, thus giving rise to irrational thinking in influencing investment decisions. Besides that, there is another factor, namely the inability of traditional finance to explain anomalies in the phenomenon of the money market and capital market, which is caused by emotions and deviations in psychological bias that affect investor behavior, so to explain the phenomena that occur must be linked to behavioral aspects (behavioral finance). This bias deviation can cause investment decisions made by investors, and this will provide less than optimal results and even cause losses on the investment that was decided [9].

Cognitive bias and emotional bias will not affect investment decisions, in addition to demographic factors such as gender and age, which will weaken or strengthen the influence between bias and investment decisions after being moderated by education and income [10]. The research model can be shown in the Figure 1, with the following moderation model as shown in Figure 2.

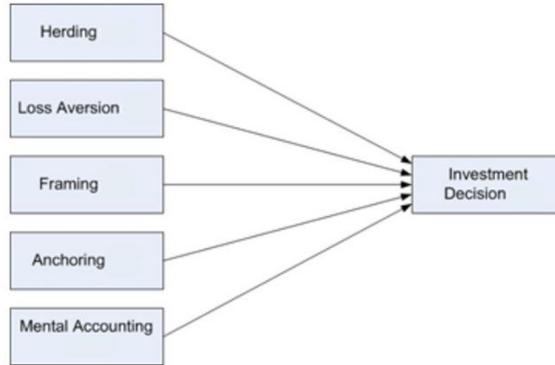


Fig. 1. Research model.

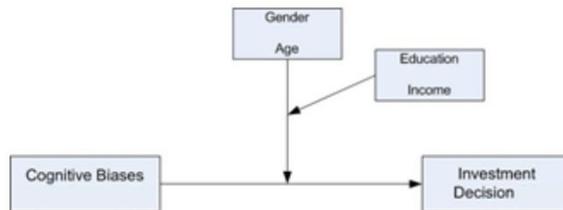


Fig. 2. Moderation model.

In the main effect model, the analysis uses multiple linear regression after confirming the classical assumptions (linearity, normality, homoscedasticity, and independence test). The main effect in multiple regression analysis can be formulated in Equation (1).

$$\text{InvestmentDecisions} = \beta_0 + \beta_1 \text{Herding} + \beta_2 \text{LossAversion} + \beta_3 \text{Framing} + \beta_4 \text{Anchoring} + \beta_5 \text{Mental Accounting} + \epsilon \quad (1)$$

Main Effects.

The main impact estimates involve five cognitive biases as independent variables and investment decisions as dependent variables. Table 1 presents estimates of the impact of various behavioral biases on the outcome variables. Each variable is evaluated through its coefficient, standard error (SE), standardized coefficient, t-statistic, and p-value. The constant term has a coefficient of 1.477 with a t-statistic of 2.709 and a p-value of 0.007, indicating that the intercept is significant in the model. This significance indicates that even without the specific impact of the included bias, there is a baseline effect on the outcome variable.

Market psychology governs investor decisions when entering a market by showing that mental errors occur in the market. Financial experts have agreed that cognitive psychology is the root of the influence of human-biased behavior on investment

decisions. Cognitive psychology describes humans translating input, then processing and producing output that is displayed in the decision results.

Table 1. Main Effect Estimates

Variables	Coefficient	English	Standardized	t statistics	p-value
(constant)	1,477	0.545 years		2,709	0.007 years
Shepherding	-0.043	0.011	-0.076 seconds	-3,782	0.000
Loss Avoidance	0.201	0.037 days	0.158	5,465	0.000
Framing	0.096 years	0.039	0.095	2,478	0.013
Anchoring	0.130	0.034 years	0.138	3,799	0.000
Mental Accounting	0.558	0.035	0.593 years	15,870	0.000

Decision-making in finance, accounting, and economics involves rational decision-making, which means that a rational decision-maker can digest all information well and determine the best choice. However, in practice, it states that the assumption of "rationality" is often violated. One of the factors that causes this is the decision frame [11].

3.2 Discussion

Each individual has a different response to the advantages and disadvantages faced. This means that each individual will make decisions not only based on the expected result but also on the conditions faced by each individual and how these conditions can affect the surrounding environment in making decisions [11].

Each individual will accept losses in a risky game more when it has been played several times than when it has been played once. They tend to think narrowly about investments made once and broadly for investments made many times [12].

In behavioral finance studies, cognitive bias occurs due to deviations in the process of understanding, processing, and making decisions on information. In cognitive psychology and decision science, it has been documented that, under certain conditions, people systematically make errors in judgment or mental errors caused by these psychological factors. So, the role of psychological factors in financial decision-making, a person often behaves strangely or irrationally when making decisions involving money because psychological factors play a greater role in financial decision-making [13].

An investor's behavior that tends to follow the actions of other investors is the most common behavioral bias, where investors tend to follow investment decisions taken by the majority. The main reason is pressure or influence from people around them, and investors tend to ignore their beliefs and abilities and then follow the actions of other investors [14].

Investors who are too afraid of experiencing losses will rush to sell stocks with poor performance because they are afraid that the stocks will lose money. In addition, investors often hold on to stocks that have fallen in price for too long because they hope the stock price will rise again [15].

Decision-makers can be influenced by information framed positively or negatively, resulting in different decisions. The downside of positively framed information is that investors will make decisions by avoiding risk. On the other hand, if decisions are

framed negatively, the decision maker will act more riskily. Information presented (framed) to the decision maker can influence the type of decision taken.

Cognitive deviation is experienced by someone when the initial estimate turns out to use the initial assessment to make the estimate. They assume that the current price is a value influenced by previous events, which causes investors to use the range of stock prices or profits based on the direction of symptoms from historical data so that investors do not react to unexpected changes. Economic behavior where a person classifies financial income and output based on items as is applicable in the accounting system.

4 Conclusions

Individual investors consist of individuals who carry out investment activities on how to manage investments and also learn how to manage their welfare (investor's wealth), which is monetary. Welfare This monetary value can be assessed from the sum of the income that has a current value (present value) with future income.

Financial behavior is an approach that explains how humans make investments or relate to finances influenced by psychological factors. In addition, a worker who chooses to invest, hereinafter referred to as an investor, will look for a combination of investment instruments that can produce the most optimal rate of return with a certain level of risk. This is known as the efficient frontier.

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