The Effect of Cognitive Bias and Emotional Bias on Gold Purchase Decisions

Diana Andriani, Muhammad Andriyansyah

Universitas Komputer Indonesia, Bandung, Indonesia
diana.andriani@email.unikom.ac.id

Abstract. In making investment decisions, there are phenomena that can lead to errors or biases that occur in individuals in the process of perceiving information related to investments. Perceptual bias is a psychological condition that tends to be less objective in perceiving something. Currently, the economic situation is uncertain, one of which is triggering the increase in gold prices. People are tempted by the profits obtained from buying and selling gold. However, in the buying and selling process, people will be influenced by behavioral biases that cause them to be irrational in making decisions. This will be tested based on whether there is an influence of cognitive bias and emotional bias on making investment decisions. The sampling technique used cluster random sampling, resulting in 600 respondents for the research sample. Hypothesis testing used the Smart-PLS method on 14 cognitive biases and six emotional biases on investment decisions, referring to Pompian theory. The results of the study showed that lecturers were influenced by 10 cognitive biases and four emotional biases that influenced investment decisions. Emotional bias is an inherent human trait and can change. Therefore, it must be balanced with rational thinking and character so investors can make informed decisions. Cognitive bias can be minimized through financial and investment education. In addition to understanding their risk profile, investors should also learn to recognize biases that can influence decision-making.

Keywords: Cognitive Bias, Emotional Bias, Decision Investment

1 Introduction

Gold is considered a safe asset and can be used as an investment during uncertain economic conditions. Currently, demand for gold, both jewelry and bullion, is increasing, especially during rising commodity prices or global economic crises. Investment decisions vary from person to person. Rational investors seek maximum returns with minimal risk. Each investor has a different risk tolerance. Furthermore, psychological factors influence investment decisions, such as emotions and moods, which can influence investment behavior [1].

Individuals' investment decisions often exhibit behavior inconsistent with rational assumptions, often based on intuition that deviates from rational assumptions. Humans are inherently cognitive misers, often stingy in their thinking, and tend to simplify their thinking, thus reducing complex thinking patterns, particularly using heuristics [2]. As

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cognitive misers, humans simplify their thought patterns and then act based on intuition.

Research by Tversky & Kahneman (1973) [3] suggests that when individuals are faced with uncertain situations and must make predictions or decisions, they tend not to perform analytical calculations or use forecasting methods. Instead, they use available information to quickly make decisions, also known as heuristics. This can lead to systematic errors. These deviations in thinking and decision-making are called heuristics and biases, and are considered irrational.

In financial theory, all decisions are based on careful consideration of information, but in reality, investors are influenced by psychological and emotional factors in their decision-making. This behavior indicates relatively deviant intuition-based actions, which are related to cognitive biases in the financial decision-making process. Given the presence of emotions and psychological biases that influence investor behavior, the phenomenon must be explained in terms of behavioral finance. These biases can lead to irrational investment decisions [4].

It is known that [5] divides bias into two types: cognitive biases and emotional biases. In the book Pompian, 2006, pp. 51–248 [5], there are 20 cognitive biases, including 14 cognitive biases: overconfidence bias, representativeness bias, anchoring and adjustment bias, cognitive dissonance bias, availability bias, self-attribution bias, ambiguity aversion bias, illusion of control bias, conservatism bias, mental accounting bias, confirmation bias, hindsight bias, recency bias, and framing bias. Cognitive biases and emotional biases can influence investors' investment decisions. Emotional biases include six biases: endowment bias, self-control bias, optimism bias, loss aversion bias, regret aversion bias, and status quo bias.

This study aims to determine which biases can influence investors' gold purchasing decisions, based on 20 behavioral biases that can occur, especially during the current uncertain economic conditions. It is necessary to study the behavioral biases that occur in order to increase returns and avoid the risk of loss.

2 Literature Review

Behavioral studies in the field of management science were born first, namely around 1930. At that time, behavioral studies were born as a critique of classical theorists, known as management behaviorism. The figure was H. Simon who received the Nobel Prize in this field in 1972. At the same time as the existence of these behavioral studies, another theory emerged that supported the classical theorists, namely scientific management theory. Next, behavioral studies emerged in the field of economics, namely around 1970, specifically when the idea of behavioral economics [4], said that individuals when faced with several alternative decisions, their choices are always inconsistent and rational according to the theory of utility of a good/service. Similarly, in the study of management science, the figure who brought behavioral studies in the field of economics gave birth to a figure who became a Nobel laureate, namely Daniel Kahneman, who shared with Vernon Lomax Smith in 2002. Both shared the Nobel Prize that year.

This behavioral economics idea was adapted by asset pricing theorists in financial management, ultimately giving rise to a new theory in financial studies, called Behavioral Finance. Similar to the two previous scientific studies, in financial management, two prominent financial theorists received the Nobel Prize: Robert J. Shiller. Subsequent research conducted by Shefrin (2000) [6] described behavioral finance as the study of psychological phenomena that influence financial behavior. Meanwhile, Nofsinger (2001) [7] defined behavioral finance as the field that studies human behavior in a financial setting, where psychological factors can influence financial decisions, companies, and financial markets [6].

Behavioral finance states that financial actors behave psychologically, consistently with rules of thumb, risk-return considerations, and a broad range of fundamental aspects that contribute to market inefficiencies [6]. Heuristics are rules of thumb or general principles related to attitudes in the decision-making process to simplify it, especially in complex and uncertain environments. To reduce complexity, it is better to measure probabilities and predict values [8].

Tandelilin, 2010 [9] defines that people should decide how much of their current income should be spent or consumed and how much should be invested based on their preferences. In determining these preferences, they should make decisions in a way that achieves the highest level of personal satisfaction. These preferences refer to the type of investment that will serve as a source of funds in the future. Besides future needs, people invest. This is triggered by the many uncertainties or other unforeseen circumstances in life, such as limited funds and health conditions, sudden disasters, and investment market conditions. Tandelilin, 2010 [9] explains the concept of investment and also states that the investment decision-making process is an ongoing process.

According to Tandelilin, 2010 [9], there are three basic investment decisions: (1) Return. The return investors expect from their investments is compensation for opportunity costs and the risk of declining purchasing power due to inflation. (2) Risk. There are two types of investors: risk-averse investors. These investors tend to recognize the linear relationship between risk and return. Investors naturally want their invested funds to provide a return commensurate with the risk. There are also risk-taker investors. More aggressive investors will choose investment vehicles with higher risks, with the expectation of higher returns, and vice versa. (3) Relationship between Risk and Return

The relationship between risk and expected return is unidirectional or linear. This means that the greater the risk of an investment, the greater the expected return on that investment, and vice versa.

2.1 Behavioral Bias

Behavioral finance identifies and studies several symptoms or events of human psychological factors found in financial markets and individual investors. Pompian, 2006 [5] explains that behavioral finance is divided into macro- and micro-financial behavior (Pompian, 2006) [5], namely: (1) explaining the impact of financial behavior on the market (2) the impact of financial behavior on the behavior of investors acting rationally or they experience cognitive and emotional deviations in making financial decisions. According to Pompian, 2006 [5], dividing bias into two parts, namely cognitive

biases and emotional biases. Among them are 14 cognitive biases, namely: overconfidence bias, representativeness bias, anchoring & adjustment bias, cognitive dissonance bias, availability bias, self-attribution bias, ambiguity aversion bias, illusion of control bias, conservatism bias, mental accounting bias, confirmation bias, hindsight bias, recency bias, and framing bias. Cognitive bias and emotional bias can occur in investors in influencing investment decisions. Emotional biases consist of six biases: endowment bias, self-control bias, optimism bias, loss aversion bias, regret aversion bias, and status quo bias.

Overconfidence bias is an individual's tendency to feel confident about their predictions. In various financial literature, overconfidence is defined as overestimating a financial asset Odean, 1998 [10] and Gervais & Odean, 2001 [11].

The concept of representativeness was first defined by Tversky & Kahneman (1974) [12] in relation to the heuristic behavior described earlier. Humans often take shortcuts when drawing conclusions and assume they represent the entire problem, even though they may not. This representativeness bias influences erroneous conclusions.

Anchoring is a cognitive bias experienced when an individual uses an initial assessment to make an estimate, only to find that the results are different [4].

Cognitive Dissonance encompasses the responses that arise when people strive to harmonize their cognitions, ultimately alleviating their mental anxiety [5].

Availability bias is a bias experienced by investors characterized by a cognitive bias where they rely on readily available information. According to Luong & Ho, 2011 [13],

Self-attribution bias is a mental process that tends to overestimate oneself and one's abilities for success, while blaming others or external factors for failure [14]

Illusion of control bias describes the behavior of people who believe they can control all investment events or activities, and this will affect their results, when in reality, they cannot. According to Pompian, 2006, pp. 111–115 [5], the illusion of control bias is a bias experienced by investors characterized by the following behaviors: (1) excessive trading, (2) maintaining an under-diversified portfolio, (3) overconfidence in predicting outcomes and believing they have more control over events than actually occurs.

According to Pompian, 2006, pp. 119–123 [5], the conservatism bias is a bias experienced by investors characterized by the following behaviors: (1) underreacting to new information, (2) maintaining previous beliefs rather than accepting new information, (3) clinging to old views, and (4) being slow to react to new information.

Research on ambiguity aversion suggests that individuals tend to avoid something ambiguous without increasing expected utility.

Mental accounting bias describes a person's tendency to code, classify, or categorize, and evaluate their income by grouping assets into accounts that they mentally believe will be used [5].

Research Rabin & Schrag, 1999 [15] and psychological research indicate that people possess cognitive biases that cause them to misinterpret new information as supporting a prior hypothesis.

Hindsight bias is the difference between people who know something will happen in the future and those who don't [16].

Recency bias is a cognitive error that causes people to remember and emphasize recent events and observations more than those in the recent or distant past. According to [5].

Framing bias is a bias experienced by individuals who tend to have certain perceptions in their decision-making, depending on the context in which the options are presented (framed). According to [5],

Emotional bias is a condition experienced by individuals who prioritize impulses in their decision-making. Emotional bias is also another psychological factor that can influence investment decisions. A person's reaction when faced with a decision can be influenced by excessive worry, resulting in an overreaction.

Endowment is a condition where someone cannot think clearly because they overvalue an item, so the item's value is perceived as higher than its market value or true value [17].

Self-control bias is a behavior that causes people to spend their money today at the expense of future savings. According to [5], optimism bias is a bias experienced by investors characterized by the following behaviors: (1) a tendency to choose good information about investments, (2) confidence in achieving high returns without considering risks, and (3) considering themselves to have above-average abilities, such as predicting.

(Loss aversion bias) is the tendency for people to feel a stronger desire to avoid losses than to gain profits [5].

Regret aversion arises because humans find it difficult to admit mistakes. Pompian, 2006 [5] states that regret aversion in investors indicates a firm avoidance of similar consequences due to fear.

One implication of loss aversion is that people tend to remain in the status quo if the losses will outweigh the gains. [18] have demonstrated this effect, called the status quo bias.

3 Methodology

A study by Kahneman & Tversky (1981) [19] on contradictory human behavior when making decisions, or the notion that individuals' assessment and selection of decision alternatives are not always consistent and rational with the utility theory of a good or service. Daniel Kahneman studied behavioral economics based on the concept of asset pricing, giving rise to a new theory, Behavioral Finance, which examines how humans make investment decisions based on their responses to the information they receive.

According to Tandelilin (2010) [9], the basis for investment decisions (Y) made by investors is as follows: (1) Investors expect a return from their investment, (2) The risk the investor will bear from that investment, and (3) The relationship between risk and expected return: the greater the risk of an investment, the greater the expected return on that investment, and vice versa.

Humans have been shown to be irrational when making decisions, or to experience deviations/biases, as explained by Pompian. Pompian divides bias into two types: cognitive biases and emotional biases. In the book Pompian, 2006 [5] there are 20 biases,

including 14 cognitive biases, namely: overconfidence bias (X1), representativeness bias (X2), anchoring & adjustment bias (X3), cognitive dissonance bias (X4), availability bias (X5), self-attribution bias (X6), ambiguity aversion bias (X7), illusion of control bias (X8), conservatism bias (X9), mental accounting bias (X10), confirmation bias (X11), hindsight bias (X12), recency bias (X13), and framing bias (X14). Cognitive bias and emotional bias can occur in investors in influencing investment decisions. Emotional bias consists of six biases, namely endowment bias (X15), self-control bias (X16), optimism bias (X17), loss aversion bias (X18), regret aversion bias (X19), and status quo bias (X20).

Based on the aforementioned studies, this study will examine whether people are influenced by cognitive bias or emotional bias when purchasing gold. The objective of this study is to examine cognitive bias and emotional bias, which influence investment decisions. This study was conducted on 600 gold buyers at Galeri 24 Bandung in January and February 2026, when gold prices began to rise.

This study used a quantitative approach, a type of research that explains social phenomena through the collection of numerical or quantitative data analyzed using specific statistical tools. The research design is explanatory research, which explains cause and effect, reasons, and provides an overview of the relationships between variables through hypothesis testing to determine what, how, and why occurs. This study was conducted by collecting information or data through questionnaires, which involved collecting data through direct surveys of gold buyers at Galeri 24, Bandung.

This study provides an overview of the causal relationship between cognitive bias and emotional bias on investment decisions.

1. Independent variables (exogenous variables/predictor variables). Exogenous variables are variables that explain or influence other variables; in this study, these are cognitive bias and emotional bias. (X)

2. The dependent variable (endogenous variable) in this study is investment decisions. (Y)

Partial Least Squares (PLS) is used in this study to test 20 hypotheses. Each hypothesis will be analyzed using SmartPLS 2.0 software to determine the relationship between each variable.

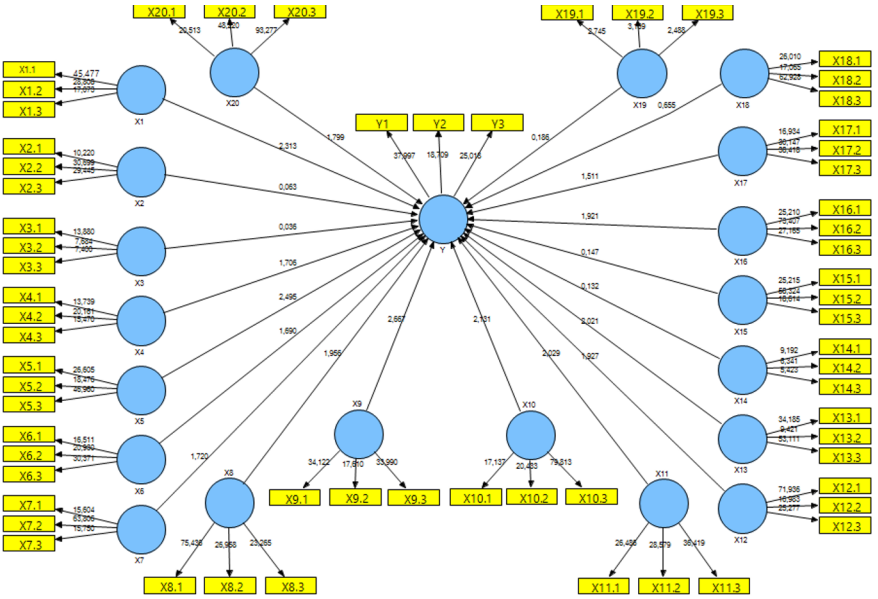

Fig. 1. Structural model with path coefficient.

The picture is framework think based on cognitive bias and emotional bias variables, several indicators of each variable, which tested its influence to decision investment.

4 Discussion

Tested whether variables X1, X2, X3, X4, X5, X6, X7 , influence against Y in terms of simultaneous so hypothesis testing was carried out simultaneous.

Hypothesis :

H_o : X1, X2, X3, X4, X5, X6, X7, X8, X9 , influential significant against Y

H_a : X1, X2, X3, X4, X5, X6, X7, X8, X9, X10 , significant against Y

criteria : If F count < F table then Ho is accepted

Table 1. Hypothesis testing simultan X1- X20 →Y.

Relationship	R square	N	df1	df2
X1- X20 □Y	0.94618	600	20	579
Relationship	R square	N	df1	df2
X1- X20 □Y	0.94618	600	20	579
Relationship	R square	N	df1	df2

Table 1. show that, all independent variables are together have influence significant to the dependent variable.

Table 2. Hypothesis testing partial variables exogenous to endogenous variables.

Path Coeff.	t Stat.	T-Table	Result
0.122	3,810	1.64	Ha Accepted (X1)
0.001	0.034	1.64	Ha Rejected (X2)
0.011	0.578	1.64	Ha Rejected (X3)
0.039	1,619	1.64	Ha Rejected (X4)
0.080	3,079	1.64	Ha Accepted (X5)
0.075	2,101	1.64	Ha Accepted (X6)
0.079	2,625	1.64	Ha Accepted (X7)
0.072	2,939	1.64	Ha Accepted (X8)
0.091	3,926	1.64	Ha Accepted (X9)
0.133	4,578	1.64	Ha Accepted (X10)
0.124	4,041	1.64	Ha Accepted (X11)
0.094	3,220	1.64	Ha Accepted (X12)
0.044	2,283	1.64	Ha Accepted (X13)
-0.007	0.348	1.64	Ha Rejected (X14)
-0.003	0.140	1.64	Ha Rejected (X15)
0.114	3,648	1.64	Ha Accepted (X16)
0.096	1,922	1.64	Ha Accepted (X17)
0.054	2,328	1.64	Ha Accepted (X18)
-0.008	0.417	1.64	Ha Rejected (X19)
0.109	2,153	1.64	Ha Accepted (X20)

Table 2. show that, the people in decision buy gold No influenced by biases X2 (representative bias), X3 (anchoring & adjustment bias), X4 (cognitive dissonance bias), X14 (framing bias), X15 (endowment bias).

5 Conclusion and Recommendation

This overconfidence bias typically occurs among male investors, as demonstrated by Kufepaksi (2010) [20]. It can affect both more and less informed investors. The results show that, in the market, investors are provided with information accessible both online and offline, giving them greater confidence in purchasing gold. This data allows them to control risk when buying or selling. The availability of market data leads investors to have an availability bias, which encourages them to seek out more comprehensive information. According to Nofsinger & Varma (2013) [21], availability bias in investors occurs when they take action based on readily available, up-to-date information.

This overconfidence bias can lead to self-attribution bias, consistent with research conducted by Iqbal (2019). Investors consider themselves experts in their abilities and knowledge and continue to buy gold when prices are high because they believe the price will rise. However, when faced with failure, this is attributed to external factors beyond their control. Ambiguity of preference arises from a reluctance to invest in risky investments and prefers gold as a safe asset, without the need for in-depth research compared to other investments. This is in line with Siegel & Yact, 2012 [22], which states that investors prefer something familiar over something unfamiliar.

Investors feel confident in predicting gold price movements, so they frequently buy and sell gold, thus ignoring the risks. The actions of someone experiencing the illusion of control bias under conditions of risk and uncertainty will differ [23] regarding the influence of the illusion of control bias and self-attribution bias on the Pakistani stock exchange. The results indicate that the illusion of control bias and self-attribution bias are predictors of investor herding behavior, as most investors lack the expertise to search for and analyze relevant information. Most investors follow others in buying gold due to the rising gold price.

Investors tend to stick with their old methods, as switching to other investments requires a relearning process and perceives greater risk, leading them to reinvest in gold. In the investment context, this type of investor relies on previous experience. The phenomenon of conservatism bias occurs in investors who have experienced previous market losses, causing them to act more cautiously than other decision-makers in similar environments [6].

Research by Li Aimei et al., 2007 [24], on mental accounting bias, revealed the theoretical structure of mental accounting in Chinese society. The results showed that Chinese people's mental accounting calculations exhibit an implicit "3-4-2" structure, with "3" representing three income accounts: regular income, management income, and unexpected income; "4" representing four expense accounts: commodity costs, development costs, hedonic costs, and relationship costs; and "2" representing two savings accounts: a security savings account and a risk investment account. This research approach suggests that we as Asians share a common behavioral bias: this grouping of income and expenses aims to protect their finances against unexpected events and economic instability, one example of which is spending on gold investments.

Confirmation bias, researched by Meppelink et al. (2019) [25], shows that people generally choose consistent information and tend to be selective in responding to new information. A study by Gait & Worthington (2008) [26] found that factors influencing financial literacy include occupation, gender, ethnicity or race, and income. Gold investors tend to seek information that only supports their belief that gold will always rise, ignoring risks such as price declines, storage costs, and price differences.

This hindsight bias can occur when individuals tend to remember their predictions about the future more accurately than they actually did (Aigbovo & Ilaboya, 2019). Investors tend to buy gold after the price has risen because they see a previous upward trend. They predict the price will continue to rise, even though the trend could reverse.

Recency bias causes short-term performance to be exaggerated in future expectations. Gold investors panic and buy gold when prices are high or are afraid to buy when prices are low, without considering fundamental analysis to mitigate risk.

Self-control bias is an individual's tendency to delay current consumption and save for future investments, prioritizing current satisfaction and pleasure. Self-control is related to proper financial management by eliminating the urge to spend money inappropriately or excessively. Investors tend to use savings or borrow money to buy gold in the pursuit of instant profits.

Optimism bias influences investors' gold purchases, namely the tendency to overestimate potential profits and ignore the risk of price declines when gold prices rise

sharply. This bias leads investors to make impulsive purchases, which risk losses if sold in the short term.

Loss aversion bias in gold buying is a psychological tendency for investors to feel excessive fear when gold prices fall and make irrational decisions. This triggers behavior such as delaying purchases due to fear of a drastic price drop or panic selling (cutting losses) when the price of gold drops slightly. Loss aversion bias is based on the differing levels of mental consequences experienced by people from losses or gains of the same magnitude. Investors suffering from loss aversion bias tend to hold onto losses rather than pursue gains.

Status quo bias is a bias experienced by individuals who tend to maintain the current status or situation. This bias impacts individuals/investors in making decisions by choosing familiar, simple, inexpensive, profitable, or situations that remain constant or unchanged. Research indicates that status quo bias positively influences investment decisions. Therefore, the higher a person's status quo bias, the more irrational their investment decisions become. Status quo bias indicates that investors prefer static decisions or avoid change [5]. Investors feel secure with their current assets (gold) rather than other investments that offer greater returns.

Cognitive and emotional biases can influence investors' decisions to buy gold. This irrational factor is an inherent human trait and can change. Therefore, it must be balanced with rational thinking and character so investors can make wise decisions. Cognitive bias can be minimized through financial and investment education. In addition to understanding their risk profile, investors should also learn to recognize biases that can influence decision-making.

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