



P-ISSN: 1978-2853  
E-ISSN: 2302-8890

## MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ojs.unud.ac.id/index.php/jmbk/index>

Vol. 18 No. 2, Agustus (2024), 125-136



# The Effect of Overconfidence, Representative, Anchoring, and Availability Biases on Investment Decisions and Market Efficiency

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DOI: <https://doi.org/10.24843/MATRIK:JMBK.2024.v18.i02.p03>

## ABSTRACT

This study looks at how behavioral biases affect investment choices and market efficiency. This research was conducted because many millennials invest on a bandwagon without having a good understanding of investment. This kind of study use the structural equation modeling analysis method. The study's findings indicate that the bias variable overconfidence behavior can strongly influence perceived market efficiency. Nevertheless, choices about investments are unaffected by the overconfidence bias, representational bias, anchoring, and availability behavior. The variable investment decision significantly influences perceived market efficiency. Investors with investment experience above five years and a high income can make a difference in investment decisions chosen by investors. This study theme's practical application relates to the findings of overconfidence bias, which has a substantial detrimental impact on investors' perceptions of market efficiency. A high degree of confidence among investors can lead to illogical judgments and disregarding all dangers, resulting in inefficient market circumstances.

**Keyword:** anchoring, financial behavior, investment decision, market efficiency, overconfidence

## INTRODUCTION

Currently, the development of investors is dominated by Gen Z, where as many as 58.39% of investors in Indonesia are under 30. Lack of experience and knowledge in investing makes millennial investors often make decisions based on information from trusted friends and influencers on social media that cannot be confirmed. Therefore, there is biased behaviour in investment decision-making. This research contributes to the millennial generation who invests on a bandwagon, to start understanding how to invest properly.

Investors make reasonable decisions about their finances, according to the Efficient Market Hypothesis (EMH) theory (Fama, 1970). Traditional finance states that investors behave rationally because information related to financial markets is available efficiently (Jain et al., 2020). However, reality shows that investors have irrational behaviour, such as following friends' decisions in buying stocks, buying stocks excessively without understanding their fundamentals, selling profitable stocks, and maintaining stocks that are losing money (Shah et al., 2018). The value of conventional finance has been called into question by this divergence. Behavioral finance has expanded due to traditional finance's abnormality (Jain et al., 2020). Because it can assist in making wise financial decisions, behavioral finance is a

fascinating and vital topic of discussion, particularly for millennials. Overconfidence bias, representative bias, anchoring and adjustment bias, and availability bias are a few examples of behavioral bias variables hypothesized to influence investment decisions and market efficiency (Shah et al., 2018). Jain et al. (2020) have reported that investing decisions can be influenced by behavioral factors, including but not limited to overconfidence bias, representational bias, anchoring bias, availability, regret aversion, loss aversion, mental accounting, and herding.

Ali (2019) states that self-attribution and overconfidence biases impact how efficiently markets are perceived. When individual investors make irrational investment decisions, financial behavior also deviates from intrinsic value (Barberis & Thaler, 2003; Goenadi et al., 2023). Because of incomplete information, investors must make a heuristic decision that they need more investments (Jain et al., 2020). Heuristics are general guidelines used to make snap judgments about investments in the face of uncertainty (Ritter, 2003). According to Kahneman et al. (1982), heuristics work by breaking down complicated probability calculations into simpler ones. Shah & Oppenheimer (2008) argue that heuristics are a method to simplify the process of making investment decisions by analyzing a limited amount of data. Overconfidence bias, representative bias, anchoring bias, and availability bias are heuristics that investors use to mitigate the risk of loss in uncertain scenarios (Shah et al., 2018). This study will delve into the bias behaviors, including availability, anchoring, representative, and overconfidence biases, that are believed to influence investing decisions. The relevance of this research to the field of investment strategy is undeniable, making it a crucial area of study for professionals in the field.

Overconfidence bias is a habit of people not trusting the judgment of others but believing that their judgment is the most appropriate (Jain et al., 2015). Overconfidence bias is significantly negative to investment decisions because if investors are too overconfident, the quality of investment decisions will decrease (Shah et al., 2018). However, other studies state the opposite, namely, overconfidence bias positively influences investment decisions. This happens because investors will have more confidence to make their investment decisions if they are more confident. Consequently, overconfidence bias may influence investing decisions (Jain et al., 2020). According to Shah et al. (2018), overconfidence bias has a beneficial impact on market efficiency as well. If overconfidence bias rises, so will market efficiency. However, different results show that overconfidence bias negatively affects perceived market efficiency. This argument is because if investors are too overconfident, then the performance of market efficiency is perceived to have decreased quality. This statement means that overconfidence bias negatively influences *perceived market efficiency*. This is because if investors are more confident, it will make the market inefficient. Therefore, overconfidence bias can reduce perceived market efficiency (Ali, 2019).

One intriguing area of research is representational bias in investor behavior. A cognitive bias heuristic known as representative bias refers to making decisions based on mental stereotypes (Shefrin, 2006). This representational bias influences people to neglect long-term situations and make decisions based on current experiences (Ritter, 2003). In addition, representative bias leads people to disregard sample measurements and base decisions on a small sample size (Ngoc, 2014). Research indicates that representational bias substantially impacts investment decisions (Shah et al., 2018). This drawback is because higher representational bias will result in lower-quality investment choices. This reasoning is consistent with the findings of Jain et al.'s research (2020), which indicates that representational bias significantly impacts investing decisions. Nonetheless, investing decisions benefit from representational bias. This benefit arises from the fact that when investor representational bias

rises, so does the investment choice. Consequently, more investment decisions may result from representational bias.

Anchoring bias is a cognitive bias heuristic that can be interpreted as the habit of individuals referring to the initial information, they get to conduct analysis and judgment (Jain et al., 2020). Individuals also feel a sense of optimism during an increasing market trend and pessimism when the market trend is decreasing (Waweru et al., 2008). After setting the initial price, the anchoring bias makes all individuals' judgments refer to it (Jain et al., 2020). Anchoring bias significantly negatively affects investment decisions because if anchoring bias increases, the quality of investment decisions will decrease (Shah et al., 2018). However, in research, anchoring bias positively influences investment decisions. This positive happens because if anchoring bias increases, the investment decision will increase (Jain et al., 2020).

The investor behavior that follows exhibits availability bias. When people exclusively use information that is easily accessible in their judgments and predictions, they are engaging in availability bias, a cognitive bias heuristic (Ngoc, 2014). According to Jain et al. (2020), availability bias also indicates that an event is more likely to occur if it is easily remembered. The quality of investment decisions will decline as availability bias develops, which substantially impacts investment decisions (Shah et al., 2018). Jain et al. (2020) found different things, demonstrating that availability bias favors investment decisions. This positive is because the investment decision will increase if the availability bias increases.

According to research by Shah et al. (2018), all independent variables negatively impact perceptions of market efficiency and investment decisions, including availability, representative, overconfidence, and anchoring biases. This result differs from Jain et al.'s (2020) research, which only found significant results for the independent variable representative bias regarding investment decisions. Other variables, such as overconfidence bias, anchoring bias, availability bias, regret aversion, loss aversion, mental accounting, and herding, showed insignificant results. Subsequently, according to Ali's research (2019), perceived market efficiency is significantly impacted negatively by all independent variables, including self-attribution bias and overconfidence bias. The difference in research results and mainly how millennial investors invest is interesting to study, especially in the developing capital market in Indonesia. This research was conducted in Indonesia, especially related to the millennial generation which currently dominates the workforce. Currently they are working and starting to earn income. But the phenomenon that occurs is that many of these generations are investing without being followed by adequate knowledge about investment. Finally, many of these novice investors experience losses and are even exposed to online loans and online gambling.

The present study aims to investigate whether overconfidence bias has a detrimental impact on the perceived efficiency of the market based on the preceding debate. Does the overconfidence bias help investors make better investment decisions? Does representational bias help when making investment decisions? Does anchoring bias help when making investment decisions? Does availability bias help investors make better investing decisions? Does the perceived efficiency of the market get a boost from investment decisions?

## **METHODS**

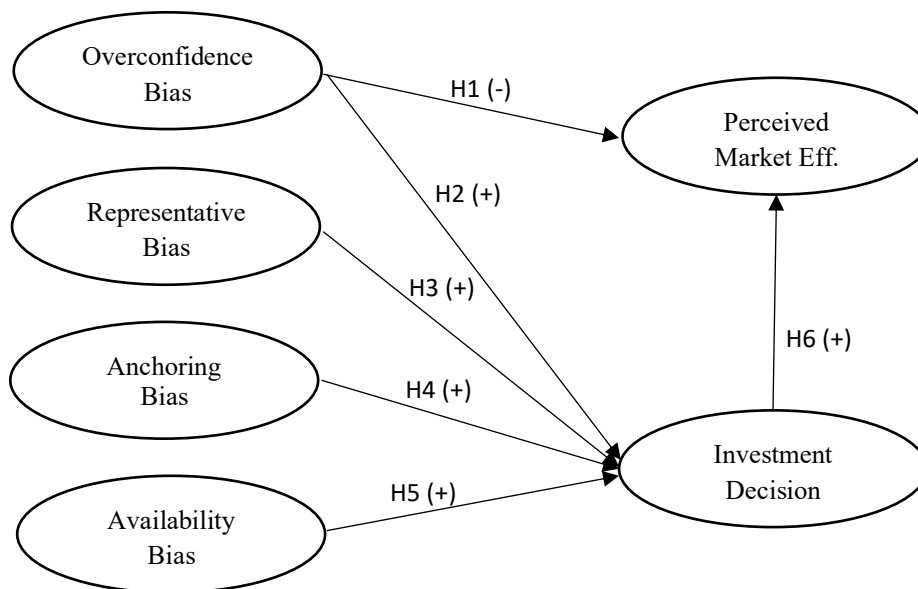
This study is fundamental and causal, including dependent variables like investment choice and perceived market efficiency and independent variables like availability, anchoring, representative, and overconfidence biases.

**Table 1.**  
**Definition of Operational Variables**

Variables	Code	Question
Investment Decision (ID) (Nyamute, 2016)	ID1	I know the basics of the firm whose stock I am investing in while making judgments.
	ID2	I set a target price in advance when I want to buy or sell my shares.
	ID3	I will assume a significant risk if I can expect a high share return.
	ID4	I hold on to my shares because I understand the price will soon go back up.
	ID5	I take full responsibility for the results of my investment decisions.
Perceived Market Efficiency (PME) (Luong & Ha, 2011)	PME1	I watch the prices of the shares that I wish to purchase fluctuate.
	PME2	In investing, market information is essential to me.
	PME3	I consider past stock trends for my investment decisions.
Overconfidence Bias (OC) (Jain <i>et al.</i> 2020 and Nada & Moa'mer 2013)	OC1	I have a lot of investing experience.
	OC2	Compared to friends or other people, I feel more confident in my judgment regarding investing decisions.
	OC3	I have a lot of investment knowledge.
	OC4	I am confident about the right time to enter or exit the market.
	OC5	I am happy with the investment decisions I made in the past.
Representative Bias (RB) (Jain <i>et al.</i> 2020 and Nada & Moa'mer 2013)	RB1	I usually tend to invest in stocks that I am familiar with
	RB2	To forecast future pricing, I look at historical price trends.
	RB3	I buy stocks based on the company's current performance.
	RB4	I steer clear of stocks that have historically underperformed and only purchase "hot" stocks.
Anchoring Bias (ANC) (Jain <i>et al.</i> 2020 and Nada & Moa'mer 2013)	ANC1	I like to sell stocks when the price reaches a peak.
	ANC2	I usually use the purchase price of stocks as a reference in trading.
	ANC3	I analyze future stock prices using the current price.
	ANC4	I buy stocks that have fallen in price compared to the previous year.
Availability Bias (AVL) (Nada & Moa'mer 2013)	AVL1	If I hear from my friend about a stock achieving the highest return, I will buy it.
	AVL2	I will use my friend's opinion to buy a company's stock.
	AVL3	I will use online research to gather information if I want to purchase shares in a specific company.
	AVL4	I plan to use knowledge from financial professionals if I wish to purchase shares in a specific company.
	AVL5	If there is news about an increase in a company's share price, and my friend also recommends the stock, then I will buy it.

The minimum number of respondents used was 113 people using the Lemeshow and David method with ( $\alpha$ ) 5% based on a 95% confidence level and a maximum estimate (p) of 8%. The sample criteria are investors at least 17 years old and active investors who bought and sold shares registered on the Indonesia Stock Exchange (IDX) last year. Based on these criteria, the final sample obtained was 149 respondents. In Table 1, the operational definition is displayed.

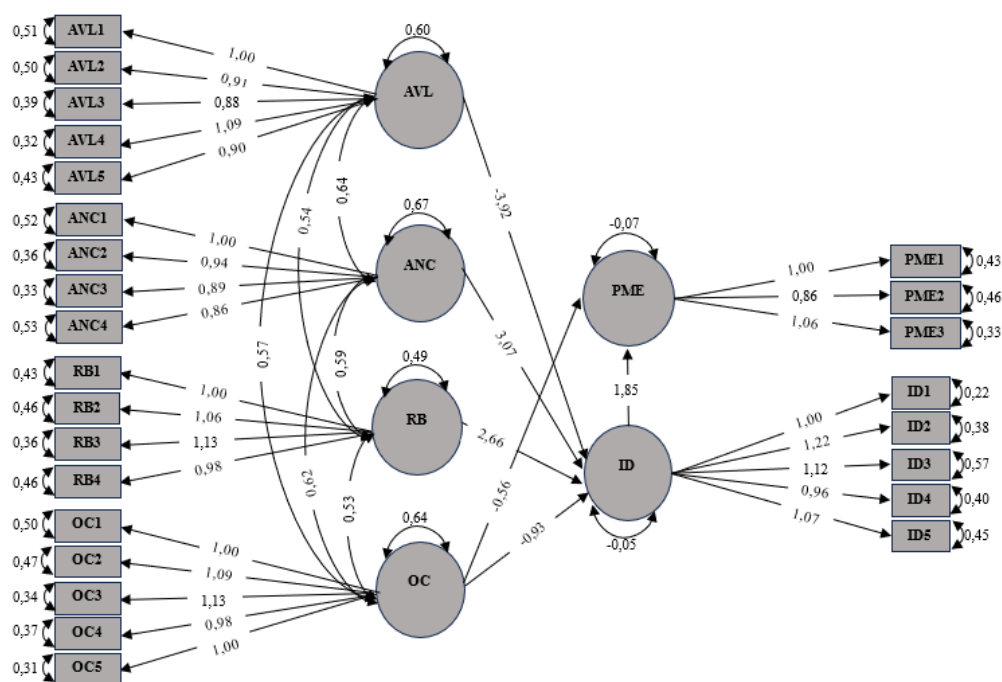
Likert scale-equipped questionnaires are distributed in order to collect data. Model testing uses the measurement and structural models from the Structural Equation Modeling (SEM) analytical method. According to Hair et al. (2020), the measurement methodology is designed to assess construct validity and identify the indicators for each construct. In the meantime, the structural model, predicated on earlier theories, shows the causal relationship between variables and constructs. In Figure 1, the research model is displayed.



**Figure 1. Research Model**

## RESULT AND DISCUSSION

In this study, validity test software was tested through JASP software. Validity testing was carried out in the first stage of the research to test the suitability of the instrument, a total of 30 questionnaires which will be tested using Pearson correlation. Instrument will be valid if the Pearson correlation results are above 0.3 and the significance value is below 0.05. All instruments show a correlation above 0.3 with a significance level below 0.05. Thus it can be said that all measurement items are valid so that testing can then be continued with a reliability test. The requirement for a reliability test is that each instrument has a Cronbach alpha value above 0.6. A measurement model is carried out to review the relationship between latent variables and their measuring indicators. The minimum standardization loading limit used in this research is 0.5. The result shown in Appendix 3 show that all of the outer loadings are above the acceptable threshold of 0.5, with the lowest value is 0.695 (ANC4). This indicates that the measurement model has a good level of validity. The fit test results show that this measurement model has good results. The CMIN/DF goodness-of-fit test shows 1.792, while the TLI results are 0.916, GFI is 0.929, and RMSEA is 0.073. The analysis proceeds by computing construct reliability (CR) and average variance extracted (AVE) based on these findings. The assessment of reliability involves evaluating the composite reliability value, which can be reinforced by considering the construct reliability value. A variable is considered to meet the reliability criteria if the construct reliability values are greater than 0.6. From the two tables above, it can be seen that all variables meet the criteria. We then continue the analysis to the structural model. Structural models are carried out to see the relationships between latent variables, as well as to test hypotheses. Initially we tested the model without moderation of employee empathy.



**Figure 2. Structural Model**

Sources: data processed, 2023

The model fit test value shows satisfactory results. The structural model has a GFI of 0.928, CMIN/DF 1.797, TLI of 0.915 and RMSEA of 0.073. The structural equation model was used to conduct the hypothesis testing, and a 10% significance level was used. The hypothesis will be declared supported if it has a p value below 0.1 and the direction of influence is the same as that hypothesized (figure 2).

After testing the *measurement and structural models*, hypothesis testing will be conducted to test all the influences in each variable. The six hypotheses in this study were tested through the JASP software version 0.16.4.0. In testing this hypothesis, standard assessment criteria determine whether a hypothesis is significant. The assessment standard can be seen from the probability value (p), which is divided into three significance criteria, namely  $p \leq 0.001$  for significant criteria at 1%, then  $p \leq 0.05$  for significant criteria at 5%, and  $p \leq 0.1$  for significant criteria at 10%.

Then, the estimate value column can function as the direction of a positive or negative effect on a hypothesis; if the estimate value shows positive, then the hypothesis is positive, and vice versa. The hypothesis is considered negative if the estimated value is negative. The outcomes of the hypothesis test are listed in Table 2.

Table 2 shows the results of hypothesis testing in this study. Based on this table, six hypotheses were tested in this study. The hypothesis consists of 2 significant effects, namely hypotheses H1 and H6, and four have no effect or rejected hypothesis. The test results for hypothesis 1 demonstrate a considerable negative impact of overconfidence bias on perceived market efficiency, as shown in Table 2. The study's findings suggest that overconfidence bias substantially impacts how efficiently people view the market, which can lead to inefficiency.



This significance is caused by investors who feel successful in determining their investment decisions, making these investors overconfident and causing irrational decision-making, making the market inefficient (Shah et al., 2018). This argument aligns with Ali's research (2019), which states that investors with high confidence tend to make market conditions inefficient.

**Table 2**  
**Hypothesis Testing Results**

	Hypothesis	CR	Estimate	$\rho$
H1	Overconfidence bias → Perceived Market Efficiency	-0,536	-0,558	0,036**
H2	Overconfidence bias → Investment Decision	-1,078	-0,931	0,821
H3	Representative bias → Investment Decision	2,694	2,655	0,832
H4	Anchoring bias → Investment Decision	3,637	3,075	0,640
H5	Availability bias → Investment Decision	-4,404	-3,917	0,777
H6	Investment Decision → Perceived Market Efficiency	1,536	1,850	<0,001***

Sources: data processed, 2023

Note: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Experiments about hypothesis 2 indicate that overconfidence bias has no discernible impact on investing choices. This outcome demonstrates that the foundation on which investors base their investment decisions differs from their aptitude and expertise (Aigbovo & Ilaboya, 2019; Sudani & Pertiwi, 2022). Research by Murhadi et al. (2023) reveals that most Gen Z investors choose stocks based on suggestions from influencers, which they accept without question. This finding is consistent with that research but also highlights the need for further investigation into the influence of influencers on investment decisions. In addition, overconfidence also refers to investors' perceptions of their ability to make investment decisions. This means it is a subjective assessment of the competence of investors in determining their investment decisions, so overconfidence *does not* affect investors' investment decisions because each investor has his perception (Fajri & Setiawati, 2023). According to Sarengat and Mahadwartha (2022), *overconfidence bias* cannot affect investment decisions because investors already have access to information technology related to financial information that can increase the financial literacy of each investor. Having access to IT can improve one's financial literacy. When investors become more financially literate, they are less likely to make rash investing decisions.

There is no discernible impact of representational bias on investing decisions, according to tests done on hypothesis 3. This result shows that good or bad past experiences in investment do not affect investors' investment decisions (Aigbovo & Ilaboya, 2019; Sudani & Pertiwi, 2022). This finding is corroborated by Elizabeth et al.'s research (2020), which shows that today's Generation Z investors are more educated than previous generations and have easier access to information, meaning that their experience does not influence their investing decisions.

There is no discernible impact of anchoring bias on investing decisions, according to tests done on hypothesis 4. This result shows that the initial stock price is not a consideration in determining investment decisions (Jain et al., 2020; Sudani & Pertiwi, 2022). According to

Koputra and Mahadwartha (2021), Indonesian investors have heterogeneous beliefs when making investment decisions, so they do not easily reach a consensus. This thesis argues that investors can make more logical investment decisions as they become more financially literate and educated.

Experiments on hypothesis 5 show a complicated truth: availability bias has little influence on investment choices. This implies abundant information from friends and financial advisors; the internet does not influence investing decisions. Because Indonesian investors have such a wide range of understanding patterns, as Koputra & Mahadwartha (2021) point out, reaching an agreement on investment decisions or finding trustworthy sources of information is essential. It might be difficult for investors to make wise investment decisions due to information overload caused by the wealth of information at their disposal.

The test results conducted on hypothesis six show that there is a positive significant effect on investment decision on perceived market efficiency. The results in this study are supported by the results of the research of Shah et al. (2018) which shows that there is a significant positive effect on investment decision on perceived market efficiency. This shows that ideal investor investment decisions have a positive effect on perceived market efficiency. Investment decision has an influence on perceived market efficiency. When investment decisions made by investors are optimal, it makes perceived market efficiency also optimal.

## CONCLUSIONS

Based on the results of hypothesis testing, two significant hypothetical results can be seen: overconfidence bias and investment decisions significantly influence perceived market efficiency. It was discovered that the biases associated with overconfidence, representation, anchoring, and availability have little bearing on investing choices.

The practical implication of this research theme is to refer to the results of overconfidence bias that significantly negatively influences perceived market efficiency; the higher the level of investor confidence, the more market conditions become inefficient. For investors, a high level of confidence will make investors ignore all risks and make irrational decisions so that market conditions can be inefficient. Another practical implication is that the research results on investment decision variables significantly influence perceived market efficiency. This result suggests that ideal investor investment decisions positively affect perceptions of market efficiency. For investors, the investment decisions they make can affect market movements. For investors, this research can provide knowledge of some biased behavior that usually occurs unnoticed by new and experienced investors. Investors can learn the signs of behavioral bias towards the investor according to the explanation of the study's results. Investors can pay more attention to the technical and fundamental of a stock. Not all information on social media financial experts can be followed by all investors. Therefore, investors must have the knowledge and experience to determine investment decisions based on the knowledge and analysis of their investors. In addition, investing in stocks has a relatively high risk; therefore, if investors are still not ready and afraid of the existing risk, they can invest in mutual funds because it has a risk that is arguably very small compared to stocks.

This study has limitations, including a lack of respondents aged 35 years and over, a lack of respondents with investment experience above five years, and a lack of respondents with high income. In the following study, the spread of questionnaires is expected to be more



evenly distributed in the age range, especially over 35 years. Also, those with investment experience above five years and a high income can make a difference in investment decisions chosen by investors because of differences in experience and income. As a result, more balanced research may be conducted in the future. This study can help with future research by shedding light on how behavioral biases affect investment choices and perceptions of market efficiency. Availability, anchoring, representative, and overconfidence biases are behavioral biases. Other behavioral biases, including cognitive dissonance, self-attribution, illusion of control, conservatism, ambiguity aversion, mental accounting, confirmation, hindsight, reception, and framing, can be added by researchers to expand this study further.

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