



The Effect of Overconfidence Bias on Investment Decision: Sharia Stock Considerations

Wahyu Febri Ramadhan Sudirman^{1✉}, **Nurnasrina**², **Muhammad Syaipudin**³, **Arif Mudi Priyatno**⁴

Sharia Banking, Pahlawan Tuanku Tambusai University, Indonesia ^(1,3)

Ekonomi Syariah, Universitas Islam Negeri Sultan Syarif Kasim Riau, Indonesia ⁽²⁾

Bisnis Digital, Pahlawan Tuanku Tambusai University, Indonesia ⁽⁴⁾

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✉ Corresponding author:

[wahyu.febri.id@universitaspahlawan.ac.id]

Article Info

Abstract

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Investment decisions are a complex process involving risk evaluation, market analysis, and investment return projections. In the decision-making process, investors sometimes show irrational behavior because they have cognitive limitations and previous investment experience so investors are exposed to overconfident behavior. This research used 178 samples consisting of investors who had investment experience of at least 1 year. The research carried out instrument testing and used the common method bias (CMB) testing procedure. The analytical method in the research uses simple linear regression. The results of testing the research hypothesis obtained positive and significant results of overconfidence bias towards irrational investment decisions. The moderating role of sharia sharia considerations on the relationship between overconfidence bias and unsupported investment decisions. This research reveals that overconfidence can have a positive influence on irrational investment decision-making. Investors who tend to have excess confidence in their knowledge and skills in analyzing the market tend to make investment decisions that are more impulsive, less rational and sometimes ignore risks significantly. Future research is recommended to further investigate the mechanisms behind the relationship between overconfidence and irrational investment decision-making, as well as involving a wider sample to obtain stronger generalizations.

1. INTRODUCTION

Investment decisions are a complex process involving risk evaluation, market analysis, and investment return projections. In this context, investor behavior has a significant impact on the investment results obtained. One aspect of investor behavior that has been the focus of attention in the behavioral finance literature is "overconfidence bias" or the tendency to be excessively confident. Overconfidence bias refers to individuals' excessive confidence in the accuracy of their estimates and personal skills (Barber & Odean, 2000). In the context of investment decisions, overconfidence can affect investors' understanding of risks and opportunities, and lead to irrational decision-making (Shah et al., 2018). Several studies have shown that overconfidence bias can

contribute to aggressive investor behavior, overly optimistic investment decisions, excessive transactions, and increased investment portfolio instability (Barber & Odean, 2000).

Previous studies have provided insight into the effects of overconfidence, leading to irrational investment decisions (Sudirman & Pratiwi, 2022), excessive trading (Barber & Odean, 2001), investors tend to ignore risks (Moore & Healy, 2008). However, there are still knowledge gaps that need further research. By understanding more deeply the factors that trigger overconfidence, as well as its impact on investment strategies and financial results, this research is expected to provide valuable insights for investors, financial practitioners, and capital market regulators. Through a deeper understanding of overconfidence bias in the context of investment decisions, it is hoped that this research can contribute to the development of financial education and risk management strategies, so that investors can make investment decisions that are more informational and based on rational analysis. Apart from that, this research is also expected to provide a more comprehensive view of the dynamics of the capital market and the behavioral factors that influence it.

The importance of understanding overconfidence bias in the context of investment decisions also arises from the observation that this tendency can contribute to market bubbles and financial crises. Moreover, overconfidence bias not only affects individual investors, but can also spill over into overall market interactions, creating collective behavioral dynamics that can lead to economic instability. By exploring overconfidence bias in the context of investment decisions, this research seeks to make a significant contribution to the development of behavioral finance theory and provide practical guidance for market participants. So, it is hoped that this research can support efforts to increase financial literacy, market efficiency and overall financial system stability.

Based on previous research findings and phenomena, this research conducts further investigation into the influence of bias, both cognitive and emotional, on investment decision making. Shefrin (2002) explains that behavioral finance is not the science of beating the market. The most important part of this concept is the recognition of the risks that exist from investor sentiment or risks that arise due to psychological factors which are sometimes greater than fundamental risks. This research is confirmed by Kartini dan Nugraha (2015) who state that various biases that occur can be detrimental, because they can result in miscalculation of possible risks. Apart from that, this bias is also difficult to control because it is invisible and is directly related to thought processes that involve emotions or feelings. This research tries to investigate the influence of overconfidence bias on investment decisions.

Behavioral finance focuses on using psychological and sociological factors to understand and explain documented irrationalities and anomalies in financial markets. Several behavioral biases, including overconfidence bias, disposition effect, cognitive dissonance, and anchoring, have been reported in the literature in several markets. Overconfidence bias is one of the most prominent behavioral biases documented in the literature to influence market participants' decision making. Overconfidence is defined as unwarranted confidence in one's intuitive reasoning, judgment and cognitive abilities (Pompian, 2006). Asri (2013) said that excessive behavior in psychology can occur when someone has "psychological problems" such as excessive assessment of the information they receive or the judgment they make regarding that information. There are two factors that can cause someone to suffer from overconfidence bias. First, it occurs when a person has experienced a situation that has been tested repeatedly. Second, it can happen because of the opposite, namely when a person actually lacks understanding or even does not have adequate abilities to deal with a problem, but is not aware of the limitations he has. This research wants to explore the influence that overconfidence bias can have on investment decisions, especially when applied to sharia stocks. The Islamic stock market has unique characteristics that include adherence to Islamic principles, such as the prohibition against *riba* (interest), gambling, and business activities involving products deemed incompatible with Islamic values. Therefore, understanding the influence of overconfidence bias in this context can provide valuable insights for investors, financial practitioners, and policy makers in Islamic financial markets.

Moore and Healy (2008) indicate that overconfidence bias appears in financial markets in three main forms, explicitly: overprecision, overplacement, and overestimation. Excessive accuracy refers to the phenomenon in which market participants place greater importance on their information, knowledge and skills and thus become overconfident. Moore and Schatz (2017) indicate that overconfidence refers to the tendency of market participants to overestimate their own skills, level of success and level of control. Odean (1999) postulates that economic actors overestimate their skills, abilities, knowledge and confidence in assessing themselves, and as a result, they become overconfident. According to Mushinada and Veluri (2018) overconfident market players tend to assume their wins are caused by their skills and knowledge, while their losses are caused by external variables. Thus, economic actors' self-attribution bias causes different levels of market actors' excessive confidence in the results of their market

activities. Overconfident economic actors underestimate the risks and carry out their trades, and this can be seen from the high volume of trading activity or excessive turnover in financial markets (Statman et al., 2006). Thus, one part of the overconfidence bias framework suggests that market participants are overconfident, they attribute market gains to their skill and astuteness in selecting securities, and as a result, they trade more aggressively and excessively in subsequent market periods.

Investment Decisions

Every investor wants to get maximum returns from their investments, wants to make optimal investment decisions (Stulz, 1995). According to Merton (1987), optimal and rational investment decisions depend on previous financial knowledge. However, investors' thoughts and feelings can change the decision-making process from rational to irrational (Nofsinger & Baker, 2002). Behavioral finance assumes that investment decisions are often irrational, due to imperfect information due to limited rationality (Pompian, 2011), psychological biases (Nofsinger & Baker, 2002), or behavioral biases (Shefrin, 2008). Investment decisions are made based on different factors, the current share and potential of the company, the technology used in the company and the value creation in the closed period (Caselli & Negri, 2018). Behavioral finance assumes that investment decisions can be irrational, due to imperfect information (Bikhchandani et al., 1992), sometimes leading to bounded rationality (Ising, 2007).

Overconfidence Bias and Investment Decisions

Overconfidence has very bad consequences for investment decision making and investor performance. Research conducted by Bakar and Yi (2016) found that overconfidence bias has a significant impact on investor decision making. Investors who suffer from overconfidence bias underestimate risk factors and overestimate expected returns (Nofsinger & Baker, 2002), their portfolios are not well diversified and they trade excessively, while experiencing lower profits or returns compared to the market (Barber & Odean, 2001). According to (Shefrin, 2002) investors overestimate their own ability to predict a trend accurately, resulting in poor forecasting. Due to overconfidence of traders, excessive trading occurs on the stock exchange, which results in low profits for traders. Investors who are too confident trade excessively, because of their confidence in their own skills and knowledge, as a result they get lower returns than others (Trinugroho & Sembel, 2011).

Research conducted by Chen et al (2007) regarding investment decision making in emerging markets and found that Chinese investors made poor trading decisions or trading mistakes because they suffered from excessive confidence bias. Kengatharan and Kengatharan (2014) found that excessive trust has a negative impact on investment-related choices and performance. Bashir et al (2013) concluded that overconfidence bias has an impact on investors' financial decisions. Waweru et al (2008) found that overconfidence bias influences the financial decisions of institutional investors on the Nairobi Stock Exchange. According to Kafayat (2014) overconfidence has a negative effect on investors' rational decision making. After reviewing relevant literature, the author believes that overconfidence can have an impact on investment decisions made by investors. These decisions lead to decisions that are irrational, excessive and tend to ignore the investment risks that will be faced, so that decisions have a negative impact on their profits, based on considerations. The researchers tested the research hypothesis: H1a: *Overconfidence can have a positive effect on irrational investment decisions.*

Overconfidence bias is the human tendency to feel more confident about their judgments and predictions than they should (Asri, 2013). In the context of investment decision making, overconfidence bias can have a significant impact. When an investor is overconfident in his ability to predict market movements or the performance of individual stocks, he may tend to take greater risks than he should (Moore & Healy, 2008). The main impact of overconfidence bias in investment decision making is an increase in the frequency and magnitude of risky decisions, which can cause significant financial losses. Overconfident investors tend to trade actively and change their portfolios more frequently, regardless of advice or analysis that may suggest acting cautiously. They may also be more prone to impulsive behavior, such as buying or selling shares quickly without careful consideration (Trinugroho & Sembel, 2011). However, the role of Islamic shares as a moderating variable in the relationship between overconfidence bias and investment decision making is interesting to investigate. Sharia shares offer an investment framework that complies with Islamic principles, which require investing in permitted businesses and avoiding businesses that are deemed detrimental or contrary to Islamic ethical principles. As a moderating variable, sharia shares can influence the extent to which overconfidence can influence investment decision making.

In this context, Islamic shares can act as a barrier against overly aggressive or speculative investment behavior which is often associated with overconfidence bias (Barber & Odean, 2001). Sharia principles that

emphasize prudence in risk taking and an emphasis on business sustainability can influence investors to consider more fundamental company factors rather than speculative behavior. In addition, making investment decisions that are more focused on sharia principles can also reduce the level of overconfidence bias by encouraging investors to pay more attention to the ethical and social aspects of their investments, which can promote more sustainable and responsible investment behavior. In conclusion, overconfidence bias can have a significant impact on investment decision making (Sudirman & Pratiwi, 2022), increasing risks and potential financial losses (Shah et al., 2018). However, sharia shares as a moderating variable can help limit the negative effects of overconfidence bias by directing investment behavior towards principles that are more careful, sustainable and in line with Islamic ethical values. After reviewing the literature above, researchers are of the opinion that the negative impact of overconfidence bias on investment decisions will be reduced when investors invest in sharia shares, because investors pay more attention to the aspects and religious value of these shares, thus influencing the investment decisions made, so that the hypothesis that tested in research: H1b: *Sharia stock selection will reduce the positive influence of overconfidence bias on irrational investment decision making.*

2. METHODS

This research was conducted on individual investors who invested on the Indonesian stock exchange (IDX). Data was collected through distributing questionnaires online through investor groups. Distributing questionnaires online is used in this research to obtain large data using not too much funds, so questionnaires are the best strategy because they can complete them whenever they have free time. Data collection has gone through common method bias mitigation procedures suggested by (Malhotra et al., 2006), such as paying attention to respondent anonymity, avoiding statements with double meaning, avoiding ambiguous statements, separating questions based on constructs and prioritizing criteria constructs, so that it will reduce social disadvantage bias in research. This research uses a purposive technique in determining the research sample so that the research sample is selected based on certain criteria. The following sample criteria have been determined by researchers: 1) have invested in financial instruments in the form of shares, 2) have a securities account (Customer Fund Account), 3) are individual investors.

Measurement

Measuring the overconfidence heuristic uses 3 questionnaire items developed by Nada and Moamer (2013) in Shah, Ahmad and Mahmood (2018) then the researchers added 2 more items from Abdin et al (2017), then measuring the availability heuristic uses eight indicators with six measurement items from Nada and Moamer (2013) in Shah, Ahmad and Mahmood (2018), then the researcher added two questionnaire items from Abdin et al (2017), then risk tolerance used three indicators previously used by (Khan et al., 2017) and four indicators used by Erapo Pinjisakikool (2018) and finally investment decisions using five items used by Scott and Bruce (1995).

Table 1. operational definitions of variables

Variable	Definition
<i>Investmen decision-making</i>	A response pattern that results in a person's tendency to make investment decisions intuitively, relying on instinct and feelings (Scott dan Bruce, 1995).
<i>Overconfidence Bias</i>	<i>Over-estimation:</i> Overestimation of a person's actual performance (Moore dan Healy 2008).
	<i>Over-placement:</i> Someone's assumption that the trading they do is better than others (Moore dan Healy 2008).
	<i>Over-Precision:</i> Overconfidence in their judgment, ignoring risk factors, associated with investment decisions (Moore dan Healy 2008).

All indicators used in the research use a 1-5 liker scale from strongly disagree to strongly agree. Furthermore, research instrument testing will be reported in detail in Table 2, Cronbach alpha, composite reliability, average variance extracted (AVE) and factor-loading for each indicator.

3. RESULT AND DISCUSSION

Descriptive statistics

The initial part of the research results will describe the demographic analysis of the respondents. Researchers described in detail the profiles of respondents based on gender, age and investment experience. The proportion of respondents consisting of men and women provides an illustration of gender participation in this research. The age groups divided into four categories reflect the age distribution of investors who are the focus of the research. Having this age breakdown helps to understand how respondent characteristics vary across age groups and can impact investment decision patterns. Meanwhile, the division based on investment experience provides additional insight into the respondent's level of understanding and exposure to the world of investment, which can be an important factor in evaluating the results of further research. Of the total 179 respondents, 119 of them were men (around 78%), and 60 of them were women (around 22%). Then, in terms of age group, researchers grouped respondents into four different categories, namely 20 years to more than 50 years. The first group, namely investors aged 20-30 years, amounted to 66 respondents or around 56%. Furthermore, investors aged >30-40 years amounted to 69 respondents or around 23% of the total respondents. Meanwhile, the age groups >40-50 years and >50 years respectively consisted of 31 people (around 11%) and 13 people (around 4%). Furthermore, based on investment experience, respondents were divided into two groups, namely investors who had 1-5 years of experience as many as 154 people or around 86%, and the second group with investment experience of more than 5 years totaling 25 people or around 14%.

Table 2. characteristics of respondents

Profile	Total	Percentage
Gender		
Man	136	76%
Woman	42	24%
Usia		
20-30 th	96	54%
>30-40 th	45	25%
>40-50 th	27	15%
>50 th	10	6%
Pengalaman investasi		
1-5th	152	85%
>5th	26	15%

Testing the validity of the instrument in this research used the Confirmatory Factor Analysis (CFA) method. The results of validity testing obtained a loading-factor value for each research item > 0.5 so that all items used in the research were valid and could be carried out further testing.

Table 3. construct outer-loading values

Construk	Indicator	Outer-Loading	Decison
Over-Estimation	OE1	0,772	Valid
	OE2	0,822	Valid
	OE3	0,839	Valid
	OE4	0,785	Valid
	OE5	0,810	Valid
Over-Placement	OPL1	0,856	Valid
	OPL2	0,813	Valid
	OPL3	0,769	Valid
Over-Precision	OP1	0,757	Valid
	OP2	0,720	Valid
	OP3	0,722	Valid
	IDM1	0,873	Valid

Investment Decision	IDM2	0,886	Valid
	IDM3	0,792	Valid
	IDM4	0,667 ^a	Valid
	IDM5	0,691 ^a	Valid

Notes: n = 178.

Instrument reliability testing uses Cronbach's alpha and composite reliability. According to Hair et al (2019) a research instrument is said to be reliable when it has a Cronbach's alpha value or composite reliability value > 0.7. The test results show that the Cronbach's alpha value for each construct is above 0.7, except for the over-precision construct which reaches 0.576. However, the composite reliability value of each research construct still exceeds 0.7. This indicates that the research instrument has an adequate level of reliability. According to Kock (2020), the use of composite reliability is considered a more accurate assessment of reliability and is closer to actual accuracy, while Cronbach's alpha tends to underestimate the reliability of the instrument and is considered too responsive to the number of indicators used in the measurement.

Table 4. reliability testing

Konstruk	CA	CR	Keputusan
Over-Estimation	0.865	0.865	Reliabel
Over-Placement	0.744	0.744	Reliabel
Over-Precision	0.576	0.576	Reliabel
Investment Decision	0.860	0.860	Reliabel

Note: CA: Cronbach's alpha, CR: Composite reliability.

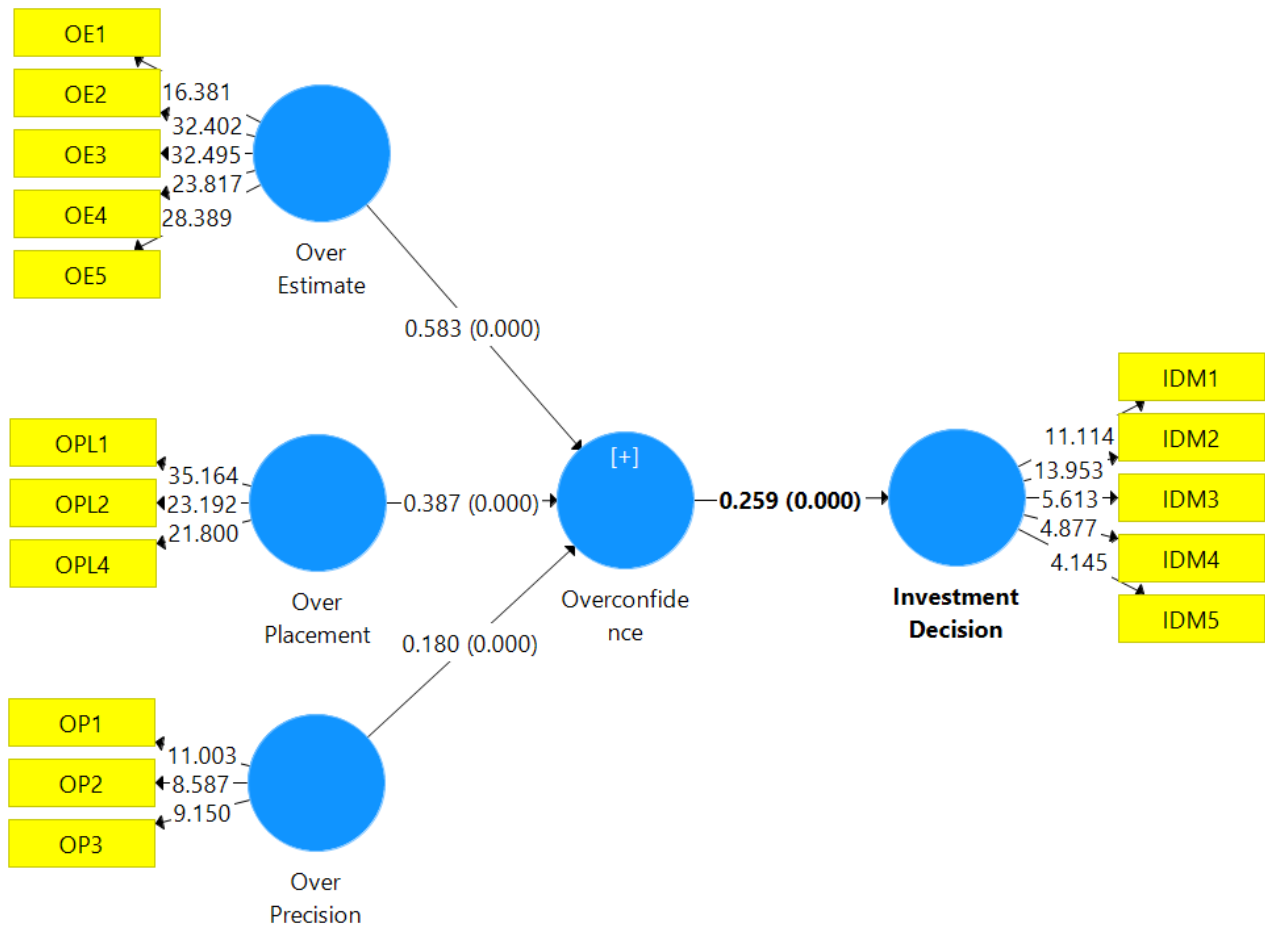
This research carried out general method bias (CMB) testing using the Harman's one single factor test method. Harman's One-Factor Test refers to a method for identifying whether common method bias might influence the results of a study. In this test, all items from the various constructs measured in the study were entered into a single factor analysis. If one factor emerges as the main cause of the variation in answers, this may indicate the presence of common method bias.

Table 5. Harman's one single-factor test.

Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.853	34.428	34.428	5.853	34.428	34.428

Extraction Method: Principal Component Analysis.

Based on the data listed in Table 6, it is found that the % variation value is 34.428%, which is below 50%. From the results of the Confirmatory Factor Analysis (CFA) test, it can be concluded that the model developed in



this research is not affected by common method bias, in line with the findings expressed by (Malhotra et al., 2006).

Fig 1. Hypothesis testing results

The results of testing the research hypothesis H1a obtained a significance value of $0.000 < 0.05$ with a coefficient of 0.259. The results of this test show that overconfidence can have a positive effect on investment decisions. This indicates that investors who have overconfident behavior will make irrational investments which will have a negative impact on their investment decisions. Next, testing the H1b hypothesis was carried out using the Multi Group Analysis (MGA) method to test the moderation hypothesis and obtained a coefficient of 0.047 with a significance value of 0.722 so that considering Islamic shares in making investment decisions had no impact on reducing overconfidence bias behavior.

Discussion

Irrational investment behavior in the capital market includes a number of behavioral patterns that conflict with the assumptions of traditional economic theory, which assumes that investors always act rationally and make decisions based on available information. One concept that details investment behavior that is not always rational is Behavioral Finance. Investors can often be influenced by emotions, risk perceptions, and cognitive behavior which can lead to investment decisions that are not always based on rational fundamental analysis (Athur, 2013). The tendency to follow market trends or make decisions based on limited information often results in price movements that cannot be explained logically. Apart from that, there are phenomena such as overtrading, where investors are too active in making transactions without a strong analytical basis. This can be caused by emotional drives, such as fear of missing opportunities or market uncertainty, which can trigger irrational investment decisions. Overconfidence behavior, or excess confidence, is an important aspect of irrational investment behavior in the capital market.

Overconfidence refers to an individual's tendency to have excessive confidence in their own abilities and judgment, even beyond the information they have (Asri, 2013). The results of this research are in line with research

conducted by Shah et al (2018) which found that overconfidence has a significant impact on decision making and poor investment results. Furthermore, Rasheed et al (2018) found that cognitive bias leads to irrational investment decisions. Furthermore, overconfident behavior can also influence risk assessment. Investors who are overconfident may tend to take higher risks than they should, in the belief that they have sufficient expertise or knowledge to overcome these risks (Kasoga, 2021). This can lead to the formation of market bubbles or overly bold investment decisions (Odean, 1999). Investors who are subject to overconfidence bias tend to underestimate potential losses and ignore warnings or information that could imply significant risks. This can strengthen the tendency to make inaccurate and irrational investment decisions.

Furthermore, the results of testing the consideration of sharia shares on the relationship between overconfidence bias and investment decisions obtained an insignificant value, meaning that investors' consideration of purchasing sharia shares does not influence overconfidence bias behavior in investment decisions. Although sharia principles encourage more careful, sustainable and responsible investment behavior, it cannot always be guaranteed that investors in the sharia stock market are free from overconfidence bias. In addition, it is important to remember that the moderating effect of Islamic shares on overconfidence bias may vary depending on the investor profile and market context. Investors who adhere more to sharia principles may tend to be more careful in their investment decisions, while investors who pay less attention to the ethical aspects of their investments may still be susceptible to overconfidence bias behavior.

4. CONCLUSION

The results of this study reveal that overconfidence bias has a positive influence on irrational investment decision making, although the moderating role of Islamic stock selection considerations on the relationship between overconfidence bias and investment decisions is not supported. Investors who tend to have excess confidence in their knowledge and skills in analyzing the market tend to make investment decisions that are more impulsive, less rational, and sometimes ignore risks significantly. This research is expected to provide additional insight for investors regarding the impact of overconfidence on investment decision making and can help design education and training programs to increase investor awareness of market risk and complexity. For companies, understanding overconfident behavior can help design more realistic marketing and communication strategies, reduce the potential for unnecessary risk taking, and increase transparency in conveying information to investors. While these findings provide valuable insight, it is important to remember that this study has certain limitations. For example, individual differences in levels of overconfidence could be an important variable that requires more in-depth research. Future research is recommended to further investigate the mechanisms behind the relationship between overconfidence and irrational investment decision making, as well as involving a wider sample to obtain stronger generalizations. A deeper understanding of the factors that moderate or strengthen this relationship can provide a more holistic view of human investment behavior in capital markets.

5. AUTHOR CONTRIBUTIONS

Wahyu Febri Ramadhan Sudirman: research ideas, literature management, data management, analysis, findings, research funding, editing, and writing process.

Nurnasrina Nurnasrina: research ideas, literature management, data management, analysis, findings, research funding, editing, and writing process.

Muhammad Syaipudin: research ideas, literature management, data management, analysis, findings, research funding, editing, and writing process.

Arif Mudi Priyatno: research ideas, literature management, data management, analysis, findings, research funding, editing, and writing process.

6. REFERENCES

Asri, M. (2013). *Keuangan Keprilakuan*. (fist). BPFE.

Athur, A. D. (2013). Effect of Behavioural Biases on Investment Decisions of Individual Investors in Kenya Abdulahi [University of Nairobi]. In *Telematics and Informatics* (Vol. 19, Issue 1). <https://doi.org/10.1016/j.tele.2017.04.002><http://dx.doi.org/10.1016/j.tele.2015.04.013><http://dx.doi.org/10.1080/17512786.2013.766062><http://dx.doi.org/10.1080/17512786.2016.1221737><http://www.hurriytdailynews.com/timeline-of-gezi-park-protests->

- Bakar, S., & Yi, A. N. C. (2016). The Impact of Psychological Factors on Investors' Decision Making in Malaysian Stock Market: A Case of Klang Valley and Pahang. *Procedia Economics and Finance*, 35(October 2015), 319–328. [https://doi.org/10.1016/s2212-5671\(16\)00040-x](https://doi.org/10.1016/s2212-5671(16)00040-x)
- Barber, B. M., & Odean, T. (2000). Trading is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors. *The Journal of Finance*, 55(2), 773–806. <https://doi.org/10.2139/ssrn.219228>
- Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *Quarterly Journal of Economics*, 116(1), 261–292. <https://doi.org/10.1162/003355301556400>
- Bashir, T., Javed, A., Usman, A., Meer, U. I., & Naseem, M. M. (2013). Empirical testing of heuristics interrupting the investor's rational decision making. *European Scientific Journal*, 9(28).
- Bikhchandani, S., Hirshleifer, D., & Welch, I. (1992). A theory of fads, fashion, custom, and cultural change as informational cascades. *Journal of Political Economy*, 100(5), 992–1026. <https://doi.org/10.1086/261849>
- Caselli, S., & Negri, G. (2018). Front Matter. In S. Ikeda (Ed.), *Private Equity and Venture Capital in Europe* (Second). Candice Janco. <https://doi.org/10.1016/b978-0-12-812254-9.09991-5>
- Chen, G., Kim, K. A., Nofsinger, J. R., & Rui, O. M. (2007). Trading Performance, Disposition Effect, Overconfidence, Representativeness Bias, and Experience of Emerging Market Investors. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.957504>
- Cupák, A., Fessler, P., & Schneebaum, A. (2021). Gender differences in risky asset behavior: The importance of self-confidence and financial literacy. *Finance Research Letters*, 42(October), 101880. <https://doi.org/10.1016/j.frl.2020.101880>
- Estes, R., & Hosseini, J. (1988). The gender gap on wall street: An empirical analysis of confidence in investment decision making. *Journal of Psychology: Interdisciplinary and Applied*, 122(6), 577–590. <https://doi.org/10.1080/00223980.1988.9915532>
- Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (Eighth). Pearson Education, Inc. <https://doi.org/10.1002/9781119409137.ch4>
- Hoffmann, A. O. I., & Post, T. (2016). How does investor confidence lead to trading? Linking investor return experiences, confidence, and investment beliefs. *Journal of Behavioral and Experimental Finance*, 12, 65–78. <https://doi.org/10.1016/j.jbef.2016.09.003>
- Ising, A. (2007). Pompian, M. (2006): Behavioral Finance and Wealth Management – How to Build Optimal Portfolios That Account for Investor Biases. In *Financial Markets and Portfolio Management* (Vol. 21, Issue 4). Wiley. <https://doi.org/10.1007/s11408-007-0065-3>
- Kafayat, A. (2014). Interrelationship of biases: effect investment decisions ultimately. *Theoretical & Applied Economics*, 21(6).
- Kartini, K., & Nugraha, N. F. (2015). Pengaruh Illusions of Control, Overconfidence Dan Emotion Terhadap Pengambilan Keputusan Investasi Pada Investor Di Yogyakarta. *Jurnal Inovasi Dan Kewirausahaan*, 4(2), 114–122. <https://doi.org/10.20885/ajie.vol4.iss2.art6>
- Kasoga, P. S. (2021). Heuristic biases and investment decisions: multiple mediation mechanisms of risk tolerance and financial literacy—a survey at the Tanzania stock market. *Journal of Money and Business*, 1(2), 102–116. <https://doi.org/10.1108/jmb-10-2021-0037>
- Kengatharan, L., & Kengatharan, N. (2014). The Influence of Behavioral Factors in Making Investment Decisions and Performance: Study on Investors of Colombo Stock Exchange, Sri Lanka. *Asian Journal of Finance & Accounting*, 6(1), 1. <https://doi.org/10.5296/ajfa.v6i1.4893>
- Kock, N. (2022). WarpPLS user manual : Version 7.0. *ScriptWarp Systems*, 1–122.
- Malhotra, N. K., Kim, S. S., & Patil, A. (2006). Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research. *Management Science*, 52(12), 1865–1883. <https://doi.org/10.1287/mnsc.1060.0597>
- Merton, R. C. (1987). A Simple Model of Capital Market Equilibrium with Incomplete Information. *The Journal of Finance*, 42(3), 483–510. <https://doi.org/10.1111/j.1540-6261.1987.tb04565.x>
- Moore, D. A., & Healy, P. J. (2008). The Trouble With Overconfidence. *Psychological Review*, 115(2), 502–517. <https://doi.org/10.1037/0033-295X.115.2.502>
- Moore, D. A., & Schatz, D. (2017). The three faces of overconfidence. *Social and Personality Psychology Compass*,

- 11(8), 1–12. <https://doi.org/10.1111/spc3.12331>
- Mushinada, V. N. C., & Veluri, V. S. S. (2018). Investors overconfidence behaviour at Bombay stock exchange. *International Journal of Managerial Finance*, 14(5), 613–632.
- Nofsinger, J. R., & Baker, H. K. (2002). Psychological_Biases_of_Investors2002. *Financial Service Review*, 11, 97–116.
- Odean, T. (1999). Do investors trade too much? *American Economic Review*, 89(5), 1279–1298. <https://doi.org/10.2307/j.ctvc4m4j8j.28>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Pompian, M. M. (2011). *Behavioral Finance and Wealth Management: How to Build Investment* (Second (ed.); Second). Wiley.
- Price, C. R. (2020). Do women shy away from competition? Do men compete too much?: A (failed) replication. *Economics Bulletin*, 40(2), 1538–1547. <https://doi.org/10.2139/ssrn.1444100>
- Qadri, S. U., & Shabbir, M. (2014). An Empirical Study of Overconfidence and Illusion of Control Biases, Impact on Investor's Decision Making: An Evidence from ISE. *European Journal of Business and Management*, 6(14), 38–44. www.iiste.org
- Rasheed, M. H., Rafique, A., Zahid, T., & Akhtar, M. W. (2018). Factors influencing investor's decision making in Pakistan: Moderating the role of locus of control. *Review of Behavioral Finance*, 10(1), 70–87. <https://doi.org/10.1108/RBF-05-2016-0028>
- Scott, S. G., & Bruce, R. A. (1995). Decision-Making Style: The Development and Assessment of a New Measure. *Educational and Psychological Measurement*, 55(5), 818–831. <https://doi.org/10.1177/0013164495055005017>
- Shah, S. Z. A., Ahmad, M., & Mahmood, F. (2018). Heuristic biases in investment decision-making and perceived market efficiency: A survey at the Pakistan stock exchange. *Qualitative Research in Financial Markets*, 10(1), 85–110. <https://doi.org/10.1108/QRFM-04-2017-0033>
- Shefrin, H. (2002). Behavioral decision making, forecasting, game theory, and role-play. *International Journal of Forecasting*, 18(3), 375–382. [https://doi.org/https://doi.org/10.1016/S0169-2070\(02\)00021-3](https://doi.org/https://doi.org/10.1016/S0169-2070(02)00021-3)
- Shefrin, H. (2008). A Behavioral Approach to Asset Pricing, Second Edition. In *A Behavioral Approach to Asset Pricing, Second Edition* (Second). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-374356-5.X5001-3>
- Simon, H. A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics*, 69(1), 99–118. <https://doi.org/10.2307/1884852>
- Skavantzios, A. (1998). Efficient residue to weighted converter for a new Residue Number System. *Proceedings of the IEEE Great Lakes Symposium on VLSI*, 9(28), 185–191. <https://doi.org/10.1109/GLSV.1998.665223>
- Soll, J. B., & Klayman, J. (2004). Overconfidence in Interval Estimates. *Journal of Experimental Psychology: Learning Memory and Cognition*, 30(2), 299–314. <https://doi.org/10.1037/0278-7393.30.2.299>
- Statman, M., Thorley, S., & Vorkink, K. (2006). Investor overconfidence and trading volume. *Review of Financial Studies*, 19(4), 1531–1565. <https://doi.org/10.1093/rfs/hhj032>
- Stulz, R. M. (1995). American Finance Association, Report of the Managing Editor of the Journal of Finance for the Year 1994. *The Journal of Finance*, 50(3), 1013. <https://doi.org/10.2307/2329297>
- Sudirman, W. F. R., & Pratiwi, A. (2022). Overconfidence Bias Dalam Pengambilan Keputusan Investasi: Peran Perbedaan Gender. *Muhammadiyah Riau Accounting and Business Journal*, 3(2), 081–092. <http://ejurnal.umri.ac.id/index.php/MRABJ>
- Suryawijaya, M. A. (2003). *Ketidakrasionalan Investor di Pasar Modal. Pidato Pengukuhan Jabatan Guru Besar pada Fakultas Ekonomi Universitas Gadjah Mada*.
- Trinugroho, I., & Sembel, R. (2011). Overconfidence and excessive trading behavior: An experimental study. *International Journal of Business and Management*, 6(7), 147.
- Waweru, N. M., Munyoki, E., & Uliana, E. (2008). The effects of behavioural factors in investment decision-making : a survey of institutional investors operating at the Nairobi Stock Exchange. *Int. J. Business and Emerging Markets*, 1(1), 24–41.