



The Impact of Financial Literacy, Overconfidence Bias, Herding Bias and Loss Aversion Bias on Investment Decision

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ARTICLE INFO

Keywords: Financial Literacy, Overconfidence Bias, Herding Bias, Loss Aversion Bias, Investment Decisions

Received : 13, August

Revised : 16, September

Accepted: 21, October

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ABSTRACT

Investment decisions, aimed at securing long-term gains, are shaped by rational and irrational attitudes in capital allocation. Financial literacy gauges the rational stance, while behavioral finance dissects irrational inclinations. Behavioral finance includes overconfidence bias, herding bias and loss aversion bias. This study scrutinizes how financial literacy, overconfidence bias, herding bias, and loss aversion bias sway investment choices for young Java Island investors. Simple random sampling is used, analyzed via Partial Least Square. Results indicate financial literacy lacks significant impact. Overconfidence boosts decisions, while high herding bias hampers them. Loss aversion bias, however, holds no sway on Java Island investors decisions.

INTRODUCTION

Investment is one of the factors that can drive economic growth in a country. It not only influences the nation but also has an impact on the well-being of society. Investment involves the activities undertaken by investors with the aim of generating future income, thereby achieving the monetary well-being of the investor (Tandelilin, 2010:4).

During the process of making an investment, an investor can be influenced by two attitudes: rational and irrational attitudes (Ariani, 2015). A rational attitude is characterized by making investment decisions based on logical reasoning, which requires data and knowledge about the investment being undertaken. An irrational attitude can be observed through an individual's level of financial literacy, as a high level of literacy indicates how well someone understands the investment they are about to make. An irrational attitude refers to when an investor makes investment decisions not solely based on logic but also incorporates psychological factors, often emotions.

The irrational attitude can be examined through the lens of behavioral finance, which highlights how psychological factors impact investment decisions. This approach delves into understanding how psychological aspects influence investment behavior.

Financial Literacy refers to an individual's ability to read, analyze, interpret, and communicate about personal financial conditions that influence well-being (Vitt et al. as cited in Arianti, 2021). Financial literacy is closely related to financial management. Individuals with a high level of financial literacy possess a deep understanding of various financial aspects, including basic financial knowledge, savings, insurance, and investments. Individuals with strong financial literacy are expected to make informed investment decisions due to their knowledge of the investment products they choose. High financial literacy is associated with making informed and sound financial choices, as individuals are equipped with the necessary understanding to assess investment options effectively.

The financial literacy index in Indonesia has shown an increase since 2019. According to data on financial literacy rates published by the OJK (Financial Services Authority) in 2019, the financial literacy index was at 38.03%, whereas in 2022, it reached 49.68%. However, as reported on www.kompas.co.id, the financial literacy rate within the Indonesian capital market has decreased by 0.86% compared to 2019, going from 4.97% to 4.11% in 2022. These data suggest that while more individuals in Indonesia are engaging in investment activities within the capital market, their understanding of the products within this market has not proportionally improved. This scenario underscores the need for continuous efforts to enhance financial literacy, particularly in the context of investment, to ensure that individuals are making informed and prudent investment decisions.

Behavioral finance, also known as financial behavior, involves the integration of psychological factors into financial decision-making. This behavioral aspect often arises among investors within the capital market. Essentially, during investment activities, investors tend to be influenced by

psychological factors. Consequently, decisions are made with irrational attitudes. The involvement of behavioral finance in decision-making frequently results in a deterioration of an investor's portfolio performance. This occurs because investment choices are not based on fundamental value but are rather influenced by psychological biases.

The irrational behavior of investors has become a primary focus due to the psychological factors associated with investment decision-making actions taken by investors. These psychological factors encompass various biases. In the context of this research, the biases that will be examined are Overconfidence Bias, Herding Bias, and Loss Aversion Bias.

The first factor is Overconfidence Bias. Overconfidence bias is a behavior that emerges when investors possess an excessive level of self-confidence in their abilities. This heightened self-assurance leads to investor behavior that involves frequent trading of stocks. According to Ferdinand and Purwanto (2022), this poor investor behavior results in an overestimation of their knowledge and abilities, often disregarding the associated risks they might encounter in the process.

The second factor is Herding Bias. According to Banerjee (1992) as cited in Febriyanti and Yuningsih (2023), Herding Bias involves behavior characterized by following others. In the context of investment, investor decisions tend to mimic those of individuals or groups. This behavior arises from investors' lack of confidence in analyzing investment decisions independently. Investors with this bias also believe that they lack sufficient and clear information to engage in investment activities.

The third factor is Loss Aversion Bias. Loss aversion bias is an investor behavior focused on avoiding losses rather than seeking gains. Investors with this bias tend to quickly sell their stocks when they experience gains, but hold onto them when facing losses. This behavior can hinder potential profits for investors, as their investment decisions are driven by a strong emphasis on avoiding losses.

According to Nadhifah and Anwar (2021), investment is the commitment of funds made in the present with the anticipation of gaining profits in the future. Investment decisions can be understood as the process of selecting the optimal investment within the available investment prospects. Making investment decisions is a crucial step for an investor. A well-informed investment choice can lead to profits for an investor. Novianggie and Asandimitra (2019) state that investment decisions involve choices made to enhance income from an asset, with the expectation of gaining future profits.

The study conducted by Sihotang and Pertiwi (2021) states that the variable Overconfidence Bias has a positive and significant impact on investment decisions. However, Khanza (2022) in their research asserts that Overconfidence Bias does not affect investment decisions. The research by Febriyanti and Yuniningsih (2023) indicates that the variable Herding Bias has a positive and significant influence on investment decisions. On the other hand, Ferdinand and Purwanto (2022) state that Herding Bias does not affect investment decisions. The study by Humairo and Panutun (2022) concludes

that the Loss Aversion Bias variable has a positive and significant impact on investment decisions. However, in the research by Sihotang and Pertiwi (2022), Loss Aversion Bias is found to have no influence on investment decisions.

Based on the descriptions of the data above, it is evident that the research outcomes regarding the influence of Financial Literacy, Overconfidence Bias, Herding Bias, and Loss Aversion Bias on Investment Decisions still yield diverse results. Consequently, further research is needed. Given the existing issues surrounding the level of financial literacy among investors and investor behavior in making investment decisions, as outlined above, a study is proposed with the title "The Influence of Financial Literacy, Overconfidence Bias, Herding Bias, and Loss Aversion Bias on Investment Decisions."

THEORETICAL REVIEW

Prospect Theory

Prospect theory is a theory developed by Kahneman and Tversky (1979). It represents a fusion of two disciplines: finance and psychology. Prospect theory can be defined as a framework that explains how individuals make choices among different risky prospects, referred to as a set of risky alternatives (Baddeley, 2018:54). The inception of this theory aimed to critique utility theory used in investment decision-making, particularly when facing high-risk situations influenced by human psychology. There are two elements within prospect theory: risk and utility (Baddeley, 2018:54).

Behavioral Finance

In the realm of investment, investors don't solely engage in estimating the prospects offered by investment instruments; they also involve psychological factors. The involvement of psychological factors in investing can influence the decisions and outcomes achieved by investors. Behavioral finance is defined as the application of psychology to finance (Pompian, 2006). Shefrin (2000) states that behavioral finance is a study that delves into how psychology affects financial behavior. From these perspectives, it can be concluded that behavioral finance is an approach that illustrates how an individual's financial-related activities are influenced by psychological factors.

Financial Literacy

Financial literacy is a fundamental need for every individual to avoid financial issues in the future. Financial literacy is closely related to financial management; if someone's level of financial management is high, their level of financial literacy can also be considered high. According to Arianti (2021), financial literacy is the ability or level of understanding an individual has about how money works. According to Vitt et al. (cited in Arianti, 2021), financial literacy is the ability to read, analyze, manage, and communicate about personal financial conditions that affect well-being. Individuals with a high level of financial literacy are expected to avoid mistakes in financial management. Financial management mistakes can include mishandling credit and failing to engage in financial planning. According to Fadila et al (2022)

there are four indicators to define financial literacy, such as 1) Basic Financial Knowledge. 2) Savings and loans. 3) Insurance. 4) Investment

H1: Financial literacy positively and significantly affected investment decisions.

Overconfidence Bias

Overconfidence bias is a bias that arises when an individual is excessively confident in the information they possess. According to Pompian (2006), this bias can be observed when someone has unwarranted beliefs in their judgment, intuitive reasoning, and cognitive abilities. Overconfidence behavior tends to be exhibited more by men. This viewpoint is supported by research conducted by Jessica and Basana (2021:48), which states that overconfidence bias is higher in men compared to women. This is evidenced by male respondents agreeing with indicators related to confidence in financial knowledge and believing their information is superior to that of other investors. According to Pompian (2006) there are four indicators that used to define overconfidence bias, such as 1) Belief in the ability to assess stocks better than other investors. 2) High frequency of stock trading. 3) Belief in the potential for high profits from the created portofolio. 4) Understanding of the investments made

H2: Overconfidence bias positively and significantly affected investment decisions.

Herding Bias

Herding bias is a behavior in which an individual unconsciously imitates what other individuals or groups are doing (Yaseer, 2013). According to Areiqat et al. (2019) as cited in Humairo and Panutun (2022), herding occurs when an investor's information is influenced by groups or other investors. Herding behavior is an irrational action in investment decision-making, where investors do not base their decisions on available information or the fundamental value of a company, but rather on the actions taken by other investors. This behavior arises when an investor believes they lack adequate knowledge and information, leading them to consider the decisions made by other investors who are perceived as role models to be better, even though this isn't always accurate. Insufficiently clear information available to investors is also a cause of herding behavior. The consequence of herding in an investor is a sudden change in decisions based on the decisions of other investors. According to Pranyoto et al (2020) there are three indicators that used to define herding bias, such as 1) Investor's decisions in choosing types of investment, impact their investment decisions 2) Decisions to buy or sell by other investors impact investment decisions. 3) Respondents react swiftly to changes in investment decisions made by other investors.

H3: Herding bias positively and significantly affected investment decisions.

Loss Aversion Bias

Loss aversion bias is a behavior exhibited by investors as a means of avoiding risks. According to Pompian (2006), loss aversion bias is a behavior

that arises when an investor has a tendency to avoid losses more than seeking gains. Investors with this bias tend to focus more on negative information compared to positive information (Harnick et al., 2012). An investor with this bias becomes overly concerned with avoiding potential risks in their investments, so when their investments do generate profits, they tend to secure those gains before the market direction changes. Investors are more sensitive to losses than gains, with the estimated impact of losses being twice as powerful as gains of the same magnitude.

The reluctance of investors to take risks limits the potential upside of their portfolios. This happens when they sell profitable investments while holding onto losing ones in the hope that the prices will revert to their initial investment levels (Pompian, 2006). Benartzi and Thaler, as cited in Pompian (2006), state that the investors who frequently evaluate their portfolios are the ones most likely to experience losses. According to Humairo et al (2020) there are five indicators that used to define loss aversion bias, such as 1) Focus on the losses experienced rather than the opportunity cost of potential gains. 2) Feel nervous when experiencing a decline in the stock prices of investments. 3) Avoid adding investments when the capital market's performance is poor. 4) Prioritize avoiding gains rather than experiencing losses when investing. 5) Refrain from selling stocks with decreasing values and selling stock with increasing values.

H4: Loss aversion bias negatively and significantly affected investment decisions.

Investment Decision

Investment involves the allocation of capital, typically over a long term, by acquiring assets or purchasing stocks and other securities with the aim of gaining profit (ojk.go.id, 2023). In making investment decisions, an investor requires supportive information. This information is then analyzed by the investor to create a decision-making model aimed at facilitating the selection of the best investment among other investment prospects. Arini (2015) states that there are two types of attitudes among investors in investment decision-making. First is the rational attitude, where investors with this attitude think logically. Second is the irrational attitude, where investors with this attitude make decisions not solely based on logic but also influenced by emotional factors.

According to Tandelilin (2010), there are two fundamentals in determining investment decisions: Return and Risk. Return is the primary reason individuals engage in investments. It represents the gains generated from one's investment activities. Risk, on the other hand, refers to the risk associated with investment activities undertaken by investors. Generally, the higher the risk in an investment, the higher the expected level of return. According to Humairo et al (2020) there are four indicators that used to define investment decisions, such as 1) Possessing knowledge about stock and investments. 2) Having clear goal for an investment. 3) Prioritizing investment profit from selected investments products. 4) Having knowledge about fluctuations in the capital market.

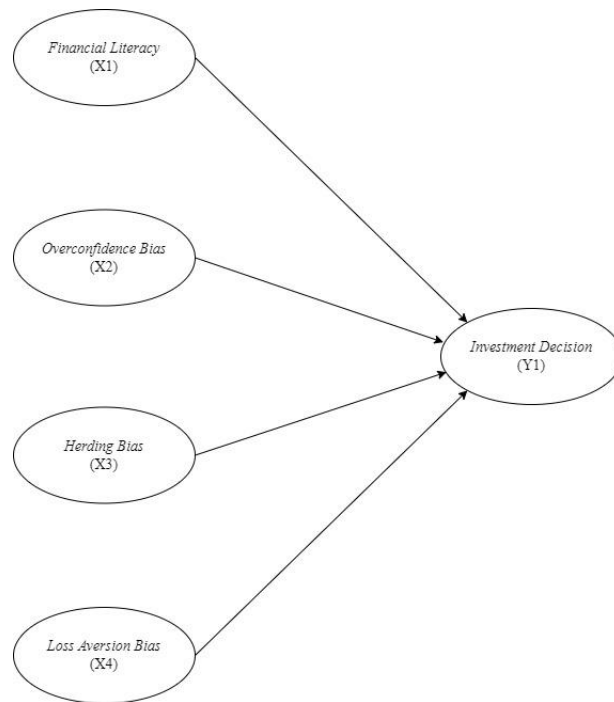


Figure 1. Conceptual Framework

METHODOLOGY

The research employs a quantitative approach, which seeks to establish the influence of the independent variable on the dependent variable. This investigation is categorized as quantitative research and involves the examination of five variables: Financial Literacy (X1), Overconfidence Bias (X2), Herding Bias (X3), and Loss Aversion Bias (X4) as independent variables, while Investment Decision (Y1) functions as the dependent variable.

The population in this study were all young investors on the Java island, totalling 4.188.525 people. The sample used in this study is simple random sampling, meaning that the entire population has an equal and independent chance of being included in the sample. Data for this study was collected through the distribution of questionnaires to young investors residing on the Java Island, utilizing an online Google Form survey. At the same time, the type of data is primary data. The tests carried out are validity, reliability, correlation coefficient and determination. The research methodology involves the application of the Partial Least Square (PLS) analysis technique, executed using WarpPls 7.0 software.

RESULTS

Outter Model Testing Convergent Validity

In conducting the validity assessment, two measurements were employed. Firstly, through the utilization of loading factors. The required loading factor construct value to meet validity criteria is greater than 0.5. A higher loading factor value signifies a stronger relationship between the items and the concept within the variable.

Table 1 Assesment of the Outter Model Correlations

Variabel	Item	Loading Factor	P-value	Explenation
Financial literacy (X1)	X1.1	0.795	<0.001	Valid
	X1.2	0.620	<0.001	Valid
	X1.3	0.729	<0.001	Valid
Overconfidence Bias (X2)	X2.1	0.833	<0.001	Valid
	X2.2	0.781	<0.001	Valid
	X2.3	0.752	<0.001	Valid
Herding Bias (X3)	X3.1	0.794	<0.001	Valid
	X3.2	0.793	<0.001	Valid
	X3.3	0.744	<0.001	Valid
Loss Aversion Bias (X4)	X4.1	0.710	<0.001	Valid
	X4.2	0.760	<0.001	Valid
	X4.3	0.614	<0.001	Valid
	X4.4	0.680	<0.001	Valid
Investment decisions (Y1)	Y1.1	0.767	<0.001	Valid
	Y1.2	0.508	<0.001	Valid
	Y1.4	0.830	<0.001	Valid

Source: WarpPLS 7.0 Processing Results

Based on the table above, there are some indicators that have to be eliminated such as X1.4, X2.4, X4.5 and Y1.3. Thus, the rest of the indicators have met the criteria of convergent validity that is above 0.5.

Discriminant Validity

The second measurement in the validity assessment involves using the Average Variance Extracted (AVE) value. AVE is a metric indicating the extent to which a construct can account for over half of the variance in its indicators. If the AVE value exceeds 0.5, it suggests that a construct can explain more than half of the variance in its respective indicators. A model is considered robust when it fulfills these criteria.

Table 2 Comparison Test of AVE

	Average variances extracted
X1 (Financial literacy)	0.516
X2 (Overconfidence Bias)	0.623
X3 (Herding Bias)	0.605
X4 (Loss Aversion Bias)	0.480
Y1 (Investment decisions)	0.512

Source: WarpPLS 7.0 Processing Results

Based on the table above, there is one variable that not meet the criteria for discriminant variable testing. Loss Aversion Bias variable AVE value is 0.48, it is below 0.5. However, according to Fornell and Larcker (1981), if the AVE value is below 50% but other criteria such as Composite Reliability > 0.6 are met, the variable can still be deemed acceptable. For the Loss Aversion Bias variable, its Composite Reliability according Table 3 is 0.786. Thus, all variables can be considered valid.

Reliability Test

Reliability testing was conducted employing Composite Reliability. Composite Reliability is utilized to gauge the extent of consistency and reliability within a construct. When the Composite Reliability value surpasses 0.7, a construct can be deemed reliable. Consequently, in this context, indicators can be affirmed as consistent in measuring the related latent variable.

Table 3 Reliability Test

	Composite reliability coefficients
X1 (Financial literacy)	0.760
X2 (Overconfidence Bias)	0.832
X3 (Herding Bias)	0.821
X4 (Loss Aversion Bias)	0.786
Y1 (Investment decisions)	0.752

Source: WarpPLS 7.0 Processing Results

Based on the results of the Composite Reliability measurements indicate that all variables meet the composite reliability criterion of being greater than 0.70, with specific values of 0.760 for the Financial Literacy variable (X1), 0.832 for the Overconfidence Bias variable (X2), 0.821 for the Herding Bias variable (X3), 0.786 for the Loss Aversion Bias variable (X4), and 0.752 for the Investment Decision variable (Y1). Therefore, all variables can be considered reliable.

Inner Model Testing

The R-squared (R²) value illustrates the proportion of variance explained by the endogenous construct. According to the interpretation guidelines, when 0.25 ≤ R² < 0.50, it is considered weak, 0.50 ≤ R² < 0.75 is moderate, and R² ≥ 0.75 is substantial (Hair et al., 2014:174-175)

Table 4 Coefficient of Determination

Variabel	Path Coefficient	P Values
X1 (Financial literacy)	-0.075	0.224
X2 (Overconfidence Bias)	0.356	<0.001

Variabel	Path Coefficient	P Values
X3 (Herding Bias)	-0.283	0.001
X4 (Loss Aversion Bias)	-0.064	0.260

Source: WarpPLS 7.0 Processing Results

Based on the table above, the variables Financial Literacy, Overconfidence Bias, Herding Bias, and Loss Aversion Bias collectively account for 0.257 or 25.7% of the variance. Consequently, this value can be interpreted as weak. This suggests that all variables in the study contribute to 25.7% of the variance in the dependent variable, Investment Decision, while the remaining 74.3% is influenced by other variables not considered in this study. Since the R^2 value falls within the range of $0.25 \leq R^2 < 0.50$, it can be inferred that financial literacy, overconfidence bias, herding bias, and loss aversion bias exert a weak influence on investment decisions.

Hypothesis Testing

Hypothesis testing in this study was conducted by examining the path coefficient values to determine the direction of influence between independent and dependent variables. When the path coefficient approaches a value of -1, it is considered to have a negative influence; conversely, when it approaches +1, it is considered to have a positive influence. Hypothesis testing was also carried out by analyzing the significance of the probability values (p-values). The criteria established for p-values with an alpha level of 5% are set at 0.05. Therefore, if the p-value is less than 0.05, the hypothesis is accepted and defined as significant. Conversely, if the p-value is greater than 0.05, the hypothesis is rejected and defined as not significant.

Table 5 Path Coefficient Values

Variabel	Path Coefficient	P Values
X1 (Financial literacy)	-0.075	0.224
X2 (Overconfidence Bias)	0.356	<0.001
X3 (Herding Bias)	-0.283	0.001
X4 (Loss Aversion Bias)	-0.064	0.260

Source: WarpPLS 7.0 Processing Results

Based on the table above, it can be seen that the Financial Literacy (H1) and Loss Aversion Bias (H4) hypotheses have p-value over 0.05, thus both hypotheses are rejected. Overconfidence bias (H2) is supported as it has a p-values below 0.05 and a path coefficient of 0.356. Thus, overconfidence hypothesis is accepted. Herding bias has a p-values below 0.05 and a path coefficient of -0.283. Therefore, the herding bias hypothesis is rejected.

DISCUSSION

The Impact of Financial Literacy on Investment Decision

Based on the research findings, it has been determined that financial literacy does not have a significant influence on investment decisions among investors on the island of Java. Although financial literacy is generally regarded as a crucial factor affecting investment decisions, this study reveals that in the context of Java, other factors might play a more dominant role in shaping investment decisions.

This research aligns with the study conducted by Muhammad et al. (2022), which also concluded that financial literacy does not significantly impact investment decisions.

The Impact of Overconfidence Bias on Investment Decision

Based on the research findings, it has been determined that Overconfidence Bias does influence investment decisions among investors on the island of Java. Overconfidence refers to an excessive feeling of self-assurance in evaluating one's own abilities and knowledge.

This research is in line with the study conducted by Humairo and Panutun (2022), which found a positive and significant impact of Overconfidence Bias on investment decisions in the capital market. Therefore, it can be concluded that the more confident an investor is in making investments, the better their investment outcomes are likely to be.

The Impact of Herding Bias on Investment Decision

Based on the conducted research, it is evident that Herding Bias has an inverse effect on investment decisions among investors on the island of Java. The absence of Herding Bias in an investor leads to an increase in the quality of their investment decision-making. Conversely, the presence of Herding Bias in an investor results in a decrease in the quality of their investment decisions.

These research findings contrast with the study by Afriani and Halawati (2019), which indicated a positive and significant impact of Herding Bias on investment decisions. However, this research aligns with the study by Santoso and Liu (2023), which stated that Herding Bias has a negative and significant influence on investment decisions due to its detrimental effect on investment outcomes. Consequently, it can be concluded that when investors base their investment decisions on collective or group actions without thorough consideration and solid information as a basis for investing, it can lead to suboptimal investment decisions.

The Impact of Loss Aversion Bias on Investment Decision

Based on the conducted research, it is found that Loss Aversion Bias does not have a significant influence on investment decisions. Despite the common expectation that loss aversion typically affects investment decisions, this research indicates the opposite.

These research findings contrast with the study by Azouzi and Anis (2012), which concluded that Loss Aversion Bias has a negative and significant

impact on investment decisions. However, these findings align with the study by Odean and Barber (1999), which stated that although there is evidence of investors exhibiting loss aversion bias, it does not exhibit statistically significant effects on investment decisions.

CONCLUSIONS AND RECOMMENDATIONS

Based on the testing results conducted using WarpPLS 7.0 to examine the influence of several variables on investment decisions, the researcher can draw several conclusions. First, Financial Literacy does not contribute to an investor's investment decisions. Having a high level of financial literacy does not necessarily guarantee effective investment behavior. This could be due to other factors, such as lacking a stable income, leading investors to prioritize other financial matters over investment activities. Second, Overconfidence Bias indeed contributes to investment decisions. Thus, heightened self-confidence among investors can enhance investment outcomes, particularly in times of uncertainty. Third, Herding Bias has an inversely contributing effect on investment decisions. Consequently, investors who base their decisions on solid information are more likely to yield favorable investment outcomes. Conversely, imitating other investors' decisions can diminish the returns on investments. Fourth, Loss Aversion Bias does not impact investment decisions. Therefore, investors' inclination to focus on potential losses rather than potential gains does not seem to affect the investment outcomes obtained.

There are two recommendations based on the results of this research. First, Investors can enhance their self-confidence in making investment decisions, both in the selection of investment types and portfolio construction, by believing in their superior abilities compared to other investors. This is intended to augment the expected investment outcomes, contingent upon the integration of well-founded information disseminated within the public domain. As a result, the investment decision-making of investors, grounded in such premises, is poised to advance the anticipated investment returns. Second, Investors are encouraged to overcome the inclination towards herding bias in their investment practices, as heightened herding bias within investors may lead to suboptimal investment decision-making. Investors can mitigate the tendency to follow the actions of their peers by actively seeking to comprehend and internalize their investment choices. Consequently, investors engage in a comprehensive study and attain a clear understanding of the investments they undertake.

FURTHER STUDY

For future researchers, it is recommended to broaden the scope of the examined sample, encompassing not only investors on the Java Island but also across the entirety of Indonesia. Then, Subsequent authors are encouraged to incorporate additional variables not encompassed within the present study, such as other biases inherent in behavioral finance.

REFERENCES

- Afriani, D., Jurusan Akuntansi Fakultas Ekonomi, A., Negeri Padang, U., & Akuntansi Fakultas Ekonomi, J. (2019). PENGARUH COGNITIVE DISSONANCE BIAS, OVERCONFIDENCE BIAS DAN HERDING BIAS TERHADAP PENGAMBILAN INVESTMENT DECISIONS (Studi Empiris Pada Mahasiswa Fakultas Ekonomi Universitas Negeri Padang Yang Melakukan Investasi Di Bursa Efek Indonesia). *Jurnal Eksplorasi Akuntansi*, 1(4), 1650-1665.
<http://jea.ppj.unp.ac.id/index.php/jea/issue/view/14>
- Ariani, S., Asiza Agustien Aulia Rahmah, P., Ramadhani Putri, Y., Rohmah, M., & Budiningrum, A. (2015). Pengaruh financial literacy, locus of control, dan etnis terhadap pengambilan investment decisions. *Journal of Business and Banking*, 5, 257-270. <https://doi.org/10.14414/jbb.v5i2.550>
- Arianti, B. F. (2021). FINANCIAL LITERACY (TEORI DAN IMPLEMENTASINYA) (W. Kurniawan, Ed.). CV. Pena Persada.
- Arijaya, C. B. J., & Basana, S. R. (2021). RISK AVERSION AND OVERCONFIDENCE IN GENDER PERSPECTIVE. *International Journal of Financial and Investment Studies (IJFIS)*, 2(1), 42-49. <https://doi.org/10.9744/ijfis.2.1.42-49>
- Azouzi, M. A., & Anis, J. (2012). CEO emotional bias and investment decision, Bayesian network method. *Management Science Letters*, 2(4), 1259-1278. <https://doi.org/10.5267/j.msl.2012.02.012>
- Baddeley, & Michelle. (2018). *Behavioural Economics and Finance*.
- Fadila, N., Goso, G., Hamid, R. S., & Ukkas, I. (2022). Pengaruh Financial literacy, Financial Technology, Persepsi Risiko, dan Locus of Control Terhadap Investment decisions Pengusaha Muda. *Owner*, 6(2), 1633-1643. <https://doi.org/10.33395/owner.v6i2.789>
- Febriyanti, R., & Yuniningsih, Y. (2023). Journal of Economics, Finance and Management Studies Psychological Bias Factors in Stock Investment Decision Making Among College Students. *Journal of Economics, Finance and Management Studies*, 6(6), 2853-2858. <https://doi.org/10.47191/jefms/v6-i6-52>
- Ferdinand, A., & Purwanto, E. (2022). Investment decisions Saham Pada Mahasiswa Fakultas Ekonomi Bisnis Universitas Pembangunan Nasional Veteran Jawa Timur. *Jurnal Ilmiah Ekonomi Dan Bisnis Universitas Multi Data Palembang*, 11(2), 372-387.
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 28, 39-50.
- Harinck, F., Van Beest, I., Van Dijk, E., & Van Zeeland, M. (2012). Measurement-induced focusing and the magnitude of loss aversion: The difference between comparing gains to losses and losses to gains. *Judgment and Decision Making*, 7(4), 462-471. <https://doi.org/10.1017/s1930297500002795>

- Humairo, A., & Panuntun, B. (2022). Perilaku Overconfidence, Loss Aversion, dan Herding Bias dalam Pengambilan Investment decisions Pasar Modal pada Generasi Z. *Selekta Manajemen: Jurnal Mahasiswa Bisnis & Manajemen*, 01(06), 213–226. <https://journal.uui.ac.id/selma/index>
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), 263–292.
- Khanza, P. R. (2022). PENGARUH COGNITIVE DISSONANCE BIAS, HINDSIGHT BIAS, OVERCONFIDENCE BIAS DAN SELF-CONTROL BIAS TERHADAP INVESTMENT DECISIONS CRYPTOCURRENCY.
- Muhammad, B., Andika, M., & MM, S. (2022). Pengaruh Financial literacy, Pengetahuan Investasidan Pendapatan Terhadap Perilaku Investment decisions Di Pasar Modal Pada Mahasiswa Di Jabodetabek. In *Seminar Nasional Akuntansi dan Manajemen*.
- Nadhifah, R., & Anwar, M. (2021). Pengaruh Financial literacy Dan Toleransi Risiko Terhadap Investment decisions (Studi Pada Warga Desa Sekapuk Kabupaten Gresik). *Jurnal Ilmiah Ekonomi Dan Bisnis*, 14(2). <http://journal.stekom.ac.id/index.php/E-Bisnis/page1>
- Novianggie, V., & Asandimitra, N. (2019). The Influence of Behavioral Bias, Cognitive Bias, and Emotional Bias on Investment Decision for College Students with Financial Literacy as the Moderating Variable. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 9(2), 92–107. <https://doi.org/10.6007/IJARAFMS/v9-i2/6044>
- Pompian, M. M. (2006). Behavioral Finance and Wealth Management How to Build Optimal Portfolios That Account for Investor Biases.
- Pranyoto, E., Susanti, & Septiyani. (2020). HERDING BEHAVIOR, EXPERIENCED REGRET DAN INVESTMENT DECISIONS. *Bisnis Darmajaya*, 06(01), 29–43.
- Santoso, I., & Liu, H. (2023). Pengaruh Perilaku Herding, Risk Aversion terhadap Investment decisions dengan Financial Attitude Sebagai Variabel Moderating. *Jurnal Ilmiah Universitas Batanghari Jambi*, 23(1), 137–144. <https://doi.org/10.33087/jiubj.v23i1.3025>
- Shefrin, H. (2000). Beyond Greed and Fear.
- Sihotang, A. E., & Pertiwi, T. K. (2021). STOCK INVESTMENT DECISION ANALYSIS ON INVESTORS IN SURABAYA. *Jurnal Ekonomi*, 17(1).
- Tandelilin, E. (2010). *Manajemen Investasi*.
- Yaseerkm, B., & LAZAR Associate Professor, D. (2013). DYNAMICS OF HERDING BEHAVIOUR IN INDIAN STOCK MARKET.