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Behavioral Bias Investors in Indonesia

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ABSTRACT	INFO ARTIKEL
<p>The purpose of the study is to examine the impact of behavioral bias (risk aversion bias; overconfidence bias; disposition bias; and herding bias) on gender-based investment decisions and empirically prove the mediating effect of financial literacy in the relationship between behavioral bias and gender-based investment decisions. Data from 329 investors in Indonesia in seven cities, including Jakarta, Semarang, Surabaya, Bandung, Medan, Palembang, and Samarinda. The results for male investors, risk aversion bias and herding bias have a negative and significant impact on investment decisions; overconfidence bias has a positive and significant impact on investment decisions, disposition bias has no significant impact. Female investors, risk aversion bias and herding bias have a negative and significant impact on investment decisions while male investors, financial literacy also has a significant impact on the influence of overconfidence bias on investment decisions.</p>	<p>Article History: <i>Submitted/Received 01 January 2025</i> <i>First Revised 05 January 2025</i> <i>Accepted 13 January 2025</i> <i>First Available online 26 April 2025</i> <i>Publication Date 26 April 2025</i></p> <p>Keyword: <i>Disposition, Herding, Overconfidence, Risk-aversion.</i></p>
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1. INTRODUCTION

Young and novice retail Investors in Indonesia are mostly social media influencers. The younger the Investors and the greater their ability and readiness to take risks, the greater the proportion of stocks. The Investors with a low level readiness to take risks usually have few assets, no retirement fund, a large number of dependents, and a need for short-term liquidity. Meanwhile, the Investors with a high level of readiness to take risks usually have no debt, a longer period before retirement, retirement fund, significant income and assets, and the opportunity to inherit. Further, in terms of the readiness to take risks, the retail Investors are categorized into those who have a low (conservative) and high tolerance for risks – notably those who desire growth, such as entrepreneurs. The financial experts must also consider the three criteria explained above.

Studies on behavioral finance explain reasoning patterns of Investors, including emotional patterns involved and the extent to which they influence investment (hereafter referred to as investment) decisions. Individuals are seen as rational Investors in the conventional financial literacy (Su, 2023). Considerations in making the investment decisions begin with a more thorough evaluation of all information from diverse sources. Previous studies by Chenini & Jarboui, (2023) and Hossain & Siddiqua, (2022) discovered that the investor exhibit irrational behaviour. Further, Mittal., (2022) underlined the significance of behavioral biases in the investors financial decisions whereas the investment concentrates on individual stock choices. Several studies have found that the Investors have a tendency to set investment goals that are unfavorable to overall investment performance, leading in unproductive investment performance. The behavioral finance theory has extensively analyzed the Investors behavior that is not in line with the rational behavior psychologically and emotionally (Parveen *et al.*, 2023). In addition, Ali *et al.*, (2023) defined the behavioral biases as a tendency to make decisions without careful considerations, which has the potential to result in investment losses. This demonstrates that irrational emotions are prioritized in psychological behavior. According to Zahera & Bansal, (2018), the behavioral biases are the tendency to make decisions that result in failures in the investment decisions.

Several studies have also attempted to explain the Investors behavior by taking into account factors other than the Investors biases. Merkle, (2017) explained that overconfident Investors tend to take risks in at least three ways: excessive fund placement, excessive forecast, and excessive investment decision accuracy. Further, Li *et al.*, (2023) found that the Investors focus more on sentiments of avoiding losses than making profits, and that the right investment decisions can be made based on their skills. According to Kumar & Goyal, (2016), despite their irrational behavior, individual Investors always learn from their investment experiences.

Literature showing that the financial literacy is one of the determinants of investment. The financial literacy contributes in the proper management of financial resources. Previous researches have revealed that the Investors with limited financial literacy make unreasonable and unprofitable investment decisions. Studies by Jain *et al.*, (2022), Concluded that the investors with a high level of financial literacy have the ability to earn a high amount of profit, whereas the investors with a low level of financial literacy have a non-diversified portfolio and tend to avoid investment in equities. Individuals with low incomes who are financial literacy are more likely to make quality investment decisions. In addition, policymakers see the financial literacy as a way to avoid failures in the investment decisions.

Furthermore, The Investor behavior is an individual aspect growing based on the information and knowledge obtained. In relation to making investment, the investors make

the investment decisions based on their financial information and knowledge. The financial literacy investors are able to make good financial decisions. Several studies have also revealed the significance of financial literacy for rational investment decisions (Ahmad *et al.*, 2023; Kasoga & Tegambwage, 2022; Sachdeva & Lehal, 2023). Based on the above description, this present study aims to, first, examine the impact of behavioral biases on novice Investors gender-based investment decisions and second, investigate the mediating influence of financial literacy in the relationships between behavioral biases and the novice Investors gender-based investment decisions. In this study, the financial literacy is seen as a significant factor determining the investment decisions. The results of this study are expected to highlight the importance of financial literacy among gender groups and how it affects the relationship between behavioral biases and investment decisions in the literature. This study is also expected to contribute to understanding how the financial literacy influences the Investors behavior while making the investment decisions. Furthermore, this present study is critical to shed light on the gender-based investment trends in order to improve the number of investment from the novice investors in Indonesia. For these reasons, this research studied individual Investors in seven major cities in Indonesia, including Jakarta, Semarang, Surabaya, Bandung, Medan, Palembang, and Samarinda. This study provides an excellent approach for proving the theories and hypotheses related to the novice Investors financial behavior. Furthermore, this study consists of a total of six sections, where Section 1 explains the introduction, Section 2 elaborates the literature review and hypothesis development, Section 3 describes the research methods and data, Section 4 explains the results, Section 5 provides the conclusions and recommendation.

Literature Review and Hypothesis Development

Behavioral Finance

Behavioral finance explains and enhances knowledge about investors' reasoning patterns, particularly the emotional patterns involved and the extent of their influence on investment decisions. A previous study conducted by Mittal., (2022) specifically explored human-centered answers to questions regarding the what, why, and how of finance and investment. Irrational decisions are made when the Investors are prone to biases and exposed to uncertainty and certain risks. According to Sekita *et al.*, (2022), the biases in the behavioral finance concept are classified into two: cognitive and emotional biases. According to the psychological theory, individuals are always led by their basic needs, as results of the influence of their environment or culture. Furthermore, the conventional financial theory and behavioral finance theory have different assumptions. The conventional financial theory assumes that the investors are rational individuals; the market is efficient; the investors are suggested to employ the mean-variance theory in making portfolios; and the expected return can be measured using the assets pricing theory. Meanwhile in the behavioral finance, it assumes that the Investors makes normal investment decisions; the market is inefficient and difficult to compete with; the Investors are suggested to follow the behavioral portfolio theory; and it applies the behavioral assets pricing theory (Tlili *et al.*, 2023).

Investment Decisions

The investment refers to the process or action of investing capital in parties in need of funds aiming to obtain profit. Meanwhile, the investors are the individuals who invest the capital. Each investors participating in investment activities has different goals and always strive to achieve them. However, there are various uncertain conditions that occur in the investment world. The investors must make the right investment decisions in order to obtain

profits, although it is difficult as the investment decisions are always related and react to investment climate – a long-term process that always goes in the same direction as business development. The investment climate is not only considered at the beginning of the investment plan, but it is a strategic variable determining the investment performance (Sourirajan & Perumandla, 2022).

Overconfidence Bias

The investment performance is the primary driver of Investors for making investments. Previous researches found that the majority of Investors manage to obtain a reasonable return on their assets (Chaudary *et al.*, 2022). Several Investors, however, do poorly in making the investment decisions due to a lack of literacy of investment and behavioral biases (Iram *et al.*, 2022). Overconfidence bias might lead to poor investment performance. In this condition, each Investors overconfidence bias is significant. The overconfidence bias is associated with overconfidence bias investment assessments. Parhi & Pal, (2022) stated that overconfidence bias investors can limit information from the rational investors. The overconfidence bias investors find it easier to determine the investment goals Kaur, (2023) than other Investors who only assume that the ultimate investment goal is to maximize profits (Fakhfakh *et al.*, 2023). Individual Investors overconfidence bias influences the investment decisions significantly (Kuranchie-Pong & Forson, 2022). Further, Parveen *et al.*, (2023) stated that the overconfidence bias has a strong negative impact on the investors decision making. Previous studies by Adil *et al.*, (2022) concluded that female Investors are less risk-aversion bias and overconfidence bias than male investors, and that the male investors have a higher trading frequency and a lower rate of return. The male Investors overconfidence bias suggested that they had more knowledge and skills, hence they always had profitable investments and felt better than the others. Therefore, hypotheses that can be proposed are as follow:

- H₁. Overconfidence bias positive affects the investment decisions of male investors .
- H₂. Overconfidence bias positive affects the investment decisions of female investors .

Herding Bias

Herding bias is one of the financial behaviors influencing the investors investment decisions. It is one of the financial activities that continues to pique the curiosity of behavioral researchers. In general, the Investors have a tendency to follow the market trends while ignoring their own beliefs. Those with low self-esteem are more likely to take advice from others. When making the investment decisions, many Investors tend to follow popular opinion or exhibit overconfidence bias. Further, the herding bias tendency stems from the Investors low-risk or risk-aversion bias tendencies, which are motivated by a desire to lower risks and financial losses (Spyrou, 2013). The investors who exhibit the herding bias are typically rational individuals who receive a lot of advices and begin to behave irrationally by depending on the advices of others. This behaviour can be attributed to the Investors lack of understanding regarding the investment and a proclivity to follow other people's ideas and recommendations (Dewan & Dharni, 2022). Mand *et al.*, (2023) discovered an interesting relationship between the herding bias and risk-return dynamics. Considering that the Investors are more likely to make decisions based on sentiment market rather than objective risk evaluation, this herding bias enhances the potential risks related to the investment. Shantha, (2019) conducted a study on the herding bias in relation to risks and uncertainty, indicating its prevalence in the US stock market. In addition, Brendea & Pop, (2019) discovered a favorable and substantial relationship between the behavioral characteristics and investment performance that was mediated by the risk perception. Similarly, Ghorbel *et*

al., (2023) investigated whether differences in individual risk perceptions could explain the association between the herding bias and investment decisions. Therefore, hypotheses that can be proposed are as follow:

- H₃. Herding bias positive affects the investment decisions of male investors .
- H₄. Herding bias positive affects the investment decisions of female investors .

Disposition Bias

The disposition effect is a prospect theory notion proposed by Tversky & Kahneman, (1974), and later developed by Shefrin & Statman, (1985). Several studies have found that most investors behave irrationally and are vulnerable to the heuristic behavior, which results in suboptimal investment selections. One of the most noticeable patterns of Investors irrationality in the financial markets is the tendency of several Investors to sell the winning stocks too soon and keep the losing stocks for too long, which Zhang *et al.*, (2022) labelled it as the disposition effect. The disposition effect is one of the theorized advancements of prospect theory by Tversky & Kahneman, (1974). A potential explanation for this effect is a combination of mental accounting Li & Huang, (2023) and the prospect theory (Tversky & Kahneman, 1974). Falah & Haryono, (2023) investigated the presence of disposition bias on mutual fund managers and discovered that there was no evidence of disposition bias effect on the investors in Indonesia and Singapore and that the investors still had a disposition effect while making the investment decisions. Therefore, hypotheses that can be proposed are as follow:

- H₅. Disposition bias positive affects the investment decisions of male investors .
- H₆. Disposition bias positive affects the investment decisions of female investors .

Risk-Aversion Bias

In a study by Chikh-Amnache & Mekhzoumi, (2023), they concluded that female Investors always behave with a risk-aversion bias, whereas male Investors are risk bearers. This contradicts the findings of a study conducted by Ahmed *et al.*, (2022), which found that this behavior is biased. Professional portfolio managers do not typically take risks when making the investment decisions. Previous researches also had shown that women are more risk-aversion bias than men (Zalata *et al.*, 2022; Petrocchi *et al.*, 2022; Hossain *et al.*, 2023; Smarr & Kriegsfeld, 2022). Therefore, hypotheses that can be proposed are as follow:

- H₇. Risk-aversion bias positive affects the investment decisions of male investors .
- H₈. Risk-aversion bias positive affects the investment decisions of female investors .

Financial Literacy and Investment Decisions

The financial literacy is defined as the capacity to use knowledge and skills to properly manage financial resources for financial well-being. It is an important component that the Investors must consider while making the investment decisions. Gender, age, and education level are demographic factors that influence the financial literacy. In most studies, men outperform women in terms of financial literacy (Aristei & Gallo, 2022). Women struggle to complete financial calculations, which limits their ability to make accurate financial decisions (Bouteska & Mili, 2022).

Watanapongvanich *et al.*, (2022) conducted a study on the level of financial literacy in the general population of the United States (US), among students (Prado *et al.*, 2022), and among elderlies (Yeh & Ling, 2022), which were found to be low. Meanwhile, Tuffour *et al.*, (2022) discovered that a lack of financial literacy has a detrimental impact on the investment

decisions. Zhang *et al.*, (2023) added that the investors with a high level of financial literacy make better investment decisions. Therefore, hypotheses that can be proposed are as follow:

H₉. Financial literacy significantly affects the investment decisions of male investors .

H₁₀. Financial literacy significantly affects the investment decisions of female investors .

Behavioral Biases, Financial Literacy, and Investment Decisions

Someone who has financial capabilities high literacy tends to be smart when faced with taking investment decision. Depending on long-term and short-term decisions (Shanmugam *et al.*, 2022; Yusfiarto *et al.*, 2023; Ansari *et al.*, 2023; Kumar *et al.*, 2023; Iram *et al.*, 2023) explain its existence the positive effect of financial literacy on Investment decisions. Therefore, hypotheses that can be proposed are as follow:

H₁₁ Financial literacy mediates the relationship between overconfidence bias and investment decisions of male investors.

H₁₂ Financial literacy mediates the relationship between overconfidence bias and investment decisions of female investors

H₁₃ Financial literacy mediates the relationship between herding bias and investment decisions of male investors .

H₁₄ Financial literacy mediates the relationship between herding bias and investment decisions of female investors.

H₁₅ Financial literacy mediates the relationship between risk-aversion bias and investment decisions of male investors

H₁₆ Financial literacy mediates the relationship between risk-aversion bias and investment decisions of female investors.

H₁₇ Financial literacy mediates the relationship between disposition bias and investment decisions of male investors .

H₁₈ Financial literacy mediates the relationship between disposition bias and investment decisions of female investors.

2. METHODOLOGY

This study employed a cross-sectional research design to evaluate the moderating influence of financial literacy on the relationships between behavioral biases and investment decisions. Primary data was also used to more accurately represent the investors behavior toward the investment decisions. The data was collected using questionnaires involving only a subset of the population. Respondents involved in this study were individuals who had made investments in Jakarta, Semarang, Surabaya, Bandung, Medan, Palembang, and Samarinda. These cities were selected as the research locations for several reasons, including: (1) having a higher per capita income (than the national average), making them high-income cities in Indonesia; and (2) having financial literacy citizens, whom met the requirements to make investments. Next, using the Slovin formula the sample size was set at 52 respondents in each city, and they had to meet the following criteria: (1) the respondents must be a citizen of the respected cities; and (2) the respondents must have made investments in various financial products. In addition, the questionnaire was distributed online through google form to a total of 364 respondents. However, only 329 of them were qualified for further analysis.

Respondent Profile

The profile of respondents of this study consisted of information on their gender, age, investment experience, and educational background, where these components were found to

be the determinants of Financial literacy and behavioral biases (Manocha *et al.*, 2023). The following Table 1 summarizes the respondent profile as follows:

Table 1
Respondent Profile

Profile		Total Investors	%
Gender Investors	Male	237	72%
	Female	92	28%
	Total	329	100%
Age Investors	20 - 26 years old	18	5%
	27 - 33 years old	211	64%
	34 - 40 years old	68	21%
	≥ 41 years old	32	10%
	Total	329	100%
Education Qualification Investors	Undergraduate degree	30	9%
	Graduate degree	120	36%
	Postgraduate degree	125	38%
	Doctoral degree	54	16%
	Total	329	100%
Invesment Experience	1 - 2 years	104	32%
	2.1 - 3 years	75	23%
	3.1 - 4 years	86	26%
	4.1 - 5 years	64	19%
	Total	329	100%

Source: primary data processed

Questionnaire Instrument

This study used a questionnaire to determine whether the behavioral biases and financial literacy influence the ability of male and female Investors to make invesment decisions. the questionnaire included the respondents demographic information (gender, age, education level, and invesment experience) and items on the research variables studied (behavioral biases, financial literacy, and invesment decisions) related to the financial market conditions.

The questionnaire was divided into Section A which includes the respondents demographic information (gender, age, education level, and invesment experience), Section B which describes questionnaire items on the research variables studied (behavioral biases, financial literacy, and invesment decisions) related to the financial market conditions. The questionnaire was measured using a 5-point-Likert Scale, ranging from 1 for highly disagree and 5 for highly agree.

Research Variable Measurement

There was a total of 24 questionnaire items. There were 4 items on FLI, and 5 items on each of variables of behavioral biases, as well as the investment decisions. They were all measured using the 5-point-Likert Scale. The list of questionnaire items can be seen in appendix 1

Data Analysis

This study analyzed the relationships between dependent and independent variables, and the role of moderator. The moderation test was considered significant in social science researches as it explained the type of causal relationship existed between the dependent and independent variables. In the data analysis, the first model examined all data to examine the moderating impact, and the second model, the data used was divided into two categories – based on the gender. Further, the hypotheses were tested using the hierarchical regression analysis. The first test involved including the behavior bias measures into the equation, which then predicted the investment decisions; and the second test involved including the financial literacy variable into the equation, followed by its moderating role. The moderating role of investment decisions could be indicated by its considerable increase in the equation.

3. RESULT AND DISCUSSION

The Maximum Likelihood was the most popular estimation method in the SEM studies and the data was analyzed using LISREL to produce valid, efficient, and reliable parameter estimates, assuming that the data fulfilled the multivariate normality and the sample size used was 100 to 200. The following Table 4. Shows the path diagram created illustrating the unstandardized estimated value of the relationships between variables. The number of samples in this study was 329, and the data had met the requirements of multicollinearity, which required no correlation between the independent variables. The following mathematical equations are derived from the SEM equation :

$$IVDM = \beta_0 + \beta_1 OVD + \beta_2 HRD + \beta_3 DPO + \beta_4 RISA + \beta_5 FLI + \varepsilon_{it} \dots \dots \dots (1)$$

$$IVDF = \beta_0 + \beta_1 OVD + \beta_1 HRD + \beta_2 DPO + \beta_3 RISA + \beta_4 FLI + \varepsilon_{it} \dots \dots \dots (2)$$

Results of path diagram analysis using the LISREL presented in the following table 1 shows the t-value estimates of the relationship between the variables.

Table 1
Direct Impact FLI, RISA, OVD, DPO, HRD, terhadap IVDM dan IVDF

Variable	Estimate	Standardized Coefficient	t - value	Result
OVD → IVDM	0.10	0.06	3.26	Supported
OVD → IVDF	0.01	-0.08	0.79	Not Supported
HRD → IVDM	0.04	0.02	1.99	Supported
HRD → IVDF	0.08	0.06	2.43	Supported

Variable	Estimate	Standardized Coefficient	t - value	Result
DPO → IVDM	0.09	-0.22	1.09	Not Supported
DPO → IVDF	0.03	-0.02	1.22	Not Supported
RISA → IVDM	0.02	0.34	2.31	Supported
RISA → IVDF	0.01	0.13	3.26	Supported
FLI → IVDM	0.01	-0.08	1,82	Not Supported
FLI → IVDF	0.02	0.42	3.25	Supported

Source: primary data processed

Note: FLI: financial literacy; RISA: risk-aversion bias; OVD: overconfidence bias; DPO: disposition effect; HRD: herding bias; and IVD: invesment decisions, IVDM: invesment decisions male, IVDF: invesment decisions Female

Table 2
Indirect Effects FLI, RISA, OVD, DPO, HRD, terhadap IVDM dan IVDF

Variable	t test	p - value	Result
OVD → FLI → IVDM	0.04239992	0.96617989	<i>p value</i> > 0,05 Not Supported
OVD → FLI → IVDF	0.93736106	0.07858709	<i>p value</i> < 0,05 Supported
HRD → FLI → IVDM	0.01940285	0.98451974	<i>p value</i> > 0,05 Not Supported
HRD → FLI → IVDF	0.05939697	0.95263593	<i>p value</i> > 0,05 Not Supported
DPO → FLI → IVDM	0.94006874	0.07518347	<i>p value</i> < 0,05 Supported
DPO → FLI → IVDF	0.97612786	0.02992376	<i>p value</i> < 0,05 Supported
RISA → FLI → IVDM	0.07787337	0.93792878	<i>p value</i> > 0,05 Not Supported
RISA → FLI → IVDF	0.12418717	0.90116708	<i>p value</i> > 0,05 Not Supported

4. CONCLUSSION

This present study aims to examine the impact of behavioral biases (overconfidence bias, disposition bias, herding bias, risk-aversion bias) on the gender-based invesment decisions and prove the moderating influence of financial literacy in the relationships between behavioral biases and gender-based invesment decisions. Theoretically, this present study could be categorized as a financial behaviour study. The results of this study conclude that

the impact of behavioral biases on the investment decisions varies. This study finds that among the male investors, the overconfidence bias, herding bias, and risk-aversion bias significantly affect the investment decisions, except the disposition effect and financial literacy which has no effect on the investment decisions. Meanwhile, among the female investors, the herding bias and risk-aversion bias are found to have a significant effect on the investment decisions, while the overconfidence bias and disposition bias are not.

Based on the results of this study, it is found that the both male and female investors tended to consider the advices given by their peer groups, either their close friends or brokers, in determining the investment's future profit goals. Further, the results of direct effect conclude that the male investors tended to be more overconfidence bias and believed their intuitions in making the investment decisions than the female investors. The male investors overconfidence bias suggested that they had more knowledge and skills, hence they always had profitable investments and felt better than the others stating that the financial literacy positively and significantly affected the investment decisions of both male and female investors. For this reason, the financial literacy could be considered as the most significant determinant of investment decisions for the investors.

Further, the results of indirect effect show that the financial literacy is able to mediate the relationship between overconfidence bias and disposition effect investment decisions of the male and female investors, and that the male investors with a higher level of financial literacy are overconfidence bias in making the investment decisions, as the financial literacy has a positive impact on both the overconfidence bias and investment decisions. Therefore, the financial literacy could be considered as the most significant determinant to lower the overconfidence bias. Meanwhile, the female investors with a high level of financial literacy tended to be more confident and their financial literacy is significant to the relationship between the overconfidence bias and investment decisions. Further, the regression results also explain that the financial literacy positively and significantly mediates the relationship between risk-aversion bias and investment decisions of the female investors, although it is contrary among the male investors. This suggested that the female investors with a high level of financial literacy tended to avoid risks.

The financial literacy partially (negatively and significantly) mediated the relationship between risk-aversion bias and investment decisions, as it lowers the positive effect of risk aversion although it is not statistically significant investors male. In addition, among the female investors, the influence of disposition bias effect on the investment decisions are significant, but not among the male investors. This finding suggested that highly financial literacy female investors did not exhibit any disposition bias effect when making the investment decisions. On the other hand, the financial literacy is found to mediate the relationship between herding bias and investment decisions significantly among the female investors, but not among the male investors. This finding indicated that the female investors with a high level of financial literacy would always consider and implement the advices from their friends or brokers as a final evaluation for making the investment decisions and they were more sensitive to the herding bias. Additionally, the regression results confirm that the female investors tend to exhibit the behavioral biases and evaluated their perceptions while making the investment decisions. This demonstrated that there was an increase in the influence of herding bias on the investment decisions. The female investors with a high level of financial literacy also had a greater impact of the herding bias on the investment decisions. In fact, the financial literacy was thought of as the main variable lowering the herding bias in making the rational investment decisions. The results of regression analysis conclude that the higher the

financial literacy of male investors, the lower the influence of financial literacy on the relationship between behavioral biases and investment decisions.

Among the male Investors, the influence of financial literacy has a partial moderation as it lowers the positive influence of financial literacy on the relationship between behavioral biases and investment decisions. This finding demonstrated that the Investors with a high level of financial literacy always evaluated and practiced various methods in making the investment decisions, compared to those with a lower level of financial literacy. These reasons supported that the financial literacy could result in a significant difference between the behavioral biases and investment decisions. Based on the existing behavioral finance literature, the financial literacy was the most important characteristic that the investment decision makers must possess, and it was also a key predictor in the relationship between behavioral biases and investment decisions, particularly for the female Investors. Based on the results of this study, there are several managerial implications for both managers and individual Investors, since the findings are beneficial for the policy makers as they emphasize that promoting the financial literacy in the society can have a significant impact on their investments.

This study also suggests that the Investors must join specific financial market trainings to help them practicing technical market analysis before making the investment decisions. Besides, overcoming the behavioral biases (overconfidence bias, risk-aversion bias, disposition bias, and herding bias and their impact on the investment decisions can be done through training programs, workshops, and seminars that can increase the Investors financial literacy, as well as raise an awareness of the importance of making investments. The ability to understand and avoid those biases that lead to detrimental investment choices, and such knowledge should be made available to potential and existing individual investors in order to help them understand how they can avoid the investment decisions that may result in significant financial loss. Therefore, future researches are suggested to conduct studies in all 33 provinces in Indonesia, and involve professional Investors to identify the extent to which other behavioral biases affect the investment decisions and promote the relationships between the behavioral biases and investment decisions.

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Appendix 1

Construct	Items
FINANCIAL LITERACY	Do you think that it is safe to INVESMENT on more than one INVESMENT destinations?
	Do you think that inflation has a negative impact on the INVESMENT?
	Do you think that compound interests allow you to earn interest on the interest and principal of your loan?
	Do you think that the time value of money and trade-off of the risk and return have an impact on the INVESMENT?
OVD	Do you think that you have the potential to make the right INVESMENT decisions?
	Do you think that you have the potential to make better INVESMENT decisions than the others?
	Do you think that you have the potential to control the outcome of the INVESMENT goals?
	Do you think that your previous INVESMENT success was due to your special skills?
	Do you think that you have a thorough understanding of financial markets?
DPO	Do you think that you should avoid selling stocks whose market value is constantly declining and instead sell the ones at risky market price?
	Do you think that you would not prefer to own stocks whose market value continues to fall over an extended period of time?
	Do you think that you would prefer to hold stocks with a higher intrinsic value than their market value?
	Do you think that you would prefer to sell stocks at a lower price immediately?
	Do you think that you would prefer to invest in stocks with rising prices?
HRD	Do you think that your peers' decisions influence your stock selection?
	Do you think that your decision is influenced by you peer group's decision to invest in a specific amount of stock?

	Do you think that you would prefer to follow changes in your peer group's Investment decisions?
	Do you think that you would prefer stocks recommended by your peers, financial experts, and the media?
	Do you think that when you hear unfavorable news (such as a decline in the US S&P rating), you would sell your stocks and prefer to place funds in low-risk Investments?
RISA	Do you think that having a big number of fixed income securities in your portfolio is appealing?
	Do you think that you feel comfortable investing in a new Investment destination?
	Do you think that you made a profit on your prior Investment and that you are willing to take a risk on your next Investment?
	Do you think that you will surely invest in stocks?
	Do you think that investing in stocks is preferable to saving money in a bank account?
INVESTMENT Decision	Do you think that the rate of return on your most recent stock Investment meets your expectation?
	Do you think that you take government regulatory statements about companies into account?
	Do you think that your trading frequency and volume meets your expectation?
	Do you think that you take the company's prior stock performance before investing into account?
	Do you think that you take your feelings towards a company's products and services into account?

