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# The Influence of Financial Literacy, Cognitive Bias and Emotional Bias on Financial Sector Investment Decisions in West Kalimantan with Risk Preference as an Intervening Variable

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**Abstract**
The purpose of this study was to test and analyze the effect of Financial Literacy, Cognitive Bias and Emotional Bias on Investment Decisions with Risk Preference as an intervening variabel. This research uses causal research. The hypothesis tested is the effect of the variabels of Financial Literacy, Cognitive Bias and Emotional Bias on Risk Preference, the variabels of Financial Literacy, Cognitive Bias and Emotional Bias on Investment Decisions. The sample used in this study amounted to 327 samples from people in West Kalimantan selected using purposive sampling technique. Analysis techniques in processing and analyzing data using Eviews 13 software with multiple linear regression testing and Sobel test. The results of this study indicate that in Equation I, Financial Literacy and Cognitive Bias partially do not have a positive influence on Risk Preference. While the Emotional Bias variabel partially has an influence on Risk Preference.

**Abstrak**
Tujuan dari penelitian ini adalah untuk menguji dan menganalisis pengaruh Financial Literacy, Cognitive Bias dan Emotional Bias on Investment Decisions with Risk Preference sebagai variabel intervensi. Penelitian ini menggunakan penelitian kausal. Hipotesis yang diuji adalah pengaruh variabel Literasi Keuangan, Bias Kognitif dan Bias Emosional terhadap Preferensi Risiko, variabel Literasi Keuangan, Bias Kognitif dan Bias Emosional terhadap Keputusan Investasi. Sampel yang digunakan dalam penelitian ini berjumlah 327 sampel dari masyarakat di Kalimantan Barat yang dipilih dengan menggunakan teknik purposive sampling. Teknik analisis dalam mengolah dan menganalisis data menggunakan perangkat lunak Eviews 13 dengan pengujian regresi linier berganda dan uji Sobel. Hasil penelitian ini menunjukkan bahwa pada Persamaan I, Literasi Keuangan dan Bias Kognitif sebagian tidak memiliki pengaruh positif terhadap Preferensi Risiko. Sedangkan variabel Bias Emosional sebagian memiliki pengaruh pada Preferensi Risiko.

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Risk Preference;
Investment Decision.

**Kata kunci**
Literasi Keuangan;
Bias Kognitif;
Bias Emosional;
Preferensi Risiko;
*Keputusan Investasi*.

## 1. Introduction

Investment is one of the crucial activities in financial planning that allows one to grow assets to achieve future financial goals. However, many people still do not understand basic financial concepts such as investment, risk management and financial planning. This lack of understanding can lead to risks in making investment decisions that are important to their financial future.

Financial literacy, which includes awareness and understanding of investment ideas and information, is crucial in ensuring the ability to make informed, safe and effective investment decisions. In addition, financial literacy also includes the skills to manage financial resources effectively, including the ability to analyze financial information and develop healthy financial behaviors.

In West Kalimantan, the level of financial literacy has increased significantly. At the beginning of 2022, the level of financial literacy in this region only reached 36.48%, still below the national average of 38.03%. However, based on the 2022 National Survey on Financial Literacy and Inclusion, the level of financial literacy in West Kalimantan increased to 51.95% in 2024, slightly higher than the national average of 49.68%.

**Table 1. Development of the Number of Single Investor Identification (SID) in West Kalimantan**

| No | Periode | Jumlah *Single Investor Identification* (SID) |
|---|---|---|
| 1 | Semester I – 2022 | 126.083 |
| 2 | Semester II – 2022 | 144.443 |
| 3 | Semester I – 2023 | 156.962 |
| 4 | Semester II – 2023 | 169.600 |
| 5 | January 2024 | 171.706 |
| 6 | February 2024 | 173.380 |
| 7 | March 2024 | 175.491 |
| 8 | April 2024 | 177.311 |

Source : OJK, 2024

This increase in financial literacy is in line with the development of the number of Single Investor Identification (SID) in West Kalimantan. This is explained in Table 1, where the data shows a consistent increase from 126,083 SID in Semester I of 2022 to 177,311 SID in April 2024. This increase indicates the growing interest and participation of investors in the capital market, which may be due to increased financial awareness, technological developments, and government policies that support the growth of the capital market.

Despite the increase in the number of investors, it is important to know whether this is matched by an adequate understanding of financial literacy and behavioral finance. Retail investors, who make up the majority of investor types in West Kalimantan, tend to be more prone to behavioral biases in making investment decisions. Therefore, it is important to know whether financial literacy and understanding of behavioral finance have a significant influence on effective and sustainable investment decisions.

Previous research by Suresh G (2021) shows that financial literacy and cognitive bias have a positive effect on investment decisions. However, the study was conducted in South India and cannot be generalized to other regions. Meanwhile, research by Kartini et al (2021) found that cognitive bias and emotional bias significantly influence investment decisions.

Based on this background and previous research, there is an opportunity to conduct further research in West Kalimantan, especially in the financial sector. This study aims to analyze the effect of financial literacy, cognitive bias, and emotional bias on financial sector investment decisions in West Kalimantan, by adding risk preference as a mediating variable.

By considering risk preference as an intervening variable, this study is expected to reveal the mechanism of how financial literacy and behavioral bias affect investment decisions through their

influence on risk preference. In addition, this study also aims to expand the understanding of the influence of emotional biases on investors' investment decisions.

The results of this study are expected to provide new insights into the factors that influence investment decisions in West Kalimantan, as well as contribute to the development of strategies to improve financial literacy and understanding of behavioral finance among retail investors. Thus, this research is not only academically relevant, but also has practical implications for investors, regulators, and financial industry players in West Kalimantan.

## 2. Method

This research was conducted in West Kalimantan with the number of respondents taken 327 people, with the sampling technique using Purposive Sampling. The minimum age of the respondent is 17 years old and the minimum education is high school, because with these criteria individuals generally have a sufficient level of maturity and responsibility to understand the consequences of financial and investment decisions. Data collection methods by means of a survey with a questionnaire tool (Google Form).

The variables and indicators used in this study are:

1) Independent Variables
   a. Financial Literacy
      Respondents' knowledge and understanding of basic financial concepts, such as interest, inflation, and investment risk. (Suresh G., 2021). Likert scale 1-7.
   b. Cognitive Bias
      Optimism or overconfidence bias (Kartini, 2021). Likert scale 1-7.
   c. Emotional Bias
      Loss aversion bias (Pompian, Michael M. (2006). Likert scale 1-7.
2) Dependent Variable
   Investment Decision.
   Fundamental analysis, technical analysis, investment portfolio composition and portfolio risk level. Likert scale 1-7.
3) Intervening Variable
   Risk Preference
   The extent to which investors tend to take risks in their investment decisions. (Ritika, 2022). Likert scale 1-7.

### 2.1. Analysis Method

This study is conducted to examine the effect of Financial Literacy, Cognitive Bias and Emotional Bias on Investment Decisions with Risk Preference as an intervening variable. The data will be processed and analyzed using the classical assumption test, then the impact will be explored through multiple linear regression testing and the Sobel test. Multiple Linear Regression Test is a testing technique that involves more than one independent variable in the regression model. Multiple linear regression analysis aims to determine the extent and direction of the influence of the independent variable on the dependent variable (Ghozali, 2018). The Sobel test is the final test which aims to evaluate whether the relationship that passes through a mediating variable has a significant effect as a mediator in the relationship.

Data is processed using Eviews 13 software. The regression model in this study is as follows. The first regression model can be formulated as follows:

$$\mathbf{Z = \alpha 1 + \beta 1X1 + \beta 2X2 + \beta 3X3 + e1}$$

The second regression model can be formulated as follows:

$$\mathbf{Y = \alpha 2 + \beta 4X1 + \beta 5X2 + \beta 6X3 + \beta 7Z + e2}$$

Description:

X1 = Financial Literacy
X2 = Cognitive Bias

X3 = Emotional Bias
Z = Risk Preference
Y = Investment Decision
e = Standar error
$\alpha 1$, $\alpha 2$ = Constant
$\beta 1$, $\beta 2 \ldots$, $\beta 7$ = Regression coefficient

## 3. Results and Discussion

### 3.1. Classical Assumption Test

Based on the results of the classical assumption test for equation I and equation II, from the normality test, the residual test results that are not normally distributed according to the Central Limit Theorem concept (Gujarat & Porter, 2009) can be ignored when the number of observations is large. The number of observations in this research is 327 respondents so that the normality assumption can be ignored. In the Multicollinearity, Autocorrelation and Heteroscedacity tests, all data passed the test and were not problematic.

### 3.2. Multiple Linear Regression Analysis

The regression equation I can be written as follows:

**3.3.** RISK PREFERENCE = 0.780123025994 + 0.000197501450511* FINANCIAL LITERACY + 0.0566124423222* **COGNITIVE**_BIAS + 0.779676502657*EMOTIONAL_BIAS + e

For regression equation II can be written as follows:
INVESTMENT DECISION = 0.597237041813 + 0.244980211053* FINANCIAL LITERACY + 0.313982891286* COGNITIVE_BIAS + 0.041970817342* EMOTIONAL_BIAS + 0.314704975085* RISK PREFERENCE + e

### 3.4. Hypothesis Test

The hypothesis test of equation I gives the following results:

**Table 2. Equation I Hypothesis Test Results**

Dependent Variable: PREFERENSI_RISIKO
Method: Least Squares
Date: 07/15/24 Time: 16:34
Sample: 1 327
Included observations: 327

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.780123 | 0.202307 | 3.856133 | 0.0001 |
| LITERASI_KEUANGAN | 0.000198 | 0.054084 | 0.003652 | 0.9971 |
| BIAS_KOGNITIF | 0.056612 | 0.057481 | 0.984889 | 0.3254 |
| BIAS_EMOSIONAL | 0.779677 | 0.044338 | 17.58471 | 0.0000 |
| R-squared | 0.588495 | Mean dependent var | | 4.720489 |
| Adjusted R-squared | 0.584673 | S.D. dependent var | | 1.232998 |
| S.E. of regression | 0.794617 | Akaike info criterion | | 2.390243 |
| Sum squared resid | 203.9473 | Schwarz criterion | | 2.436604 |
| Log likelihood | -386.8048 | Hannan-Quinn criter. | | 2.408742 |
| F-statistic | 153.9743 | Durbin-Watson stat | | 2.045975 |
| Prob(F-statistic) | 0.000000 | | | |

The hypothesis test of equation II gives the following results:

**Table 3. Equation II Hypothesis Test Results**

Dependent Variable: KEPUTUSAN_INVESTASI
Method: Least Squares
Date: 07/15/24 Time: 17:14
Sample: 1 327
Included observations: 327

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.597237 | 0.191841 | 3.113194 | 0.0020 |
| LITERASI_KEUANGAN | 0.244980 | 0.050145 | 4.885450 | 0.0000 |
| BIAS_KOGNITIF | 0.313983 | 0.053374 | 5.882664 | 0.0000 |
| BIAS_EMOSIONAL | 0.041971 | 0.057513 | 0.729758 | 0.4661 |
| PREFERENSI_RISIKO | 0.314705 | 0.051589 | 6.100268 | 0.0000 |
| R-squared | 0.628514 | Mean dependent var | | 4.801223 |
| Adjusted R-squared | 0.623899 | S.D. dependent var | | 1.201328 |
| S.E. of regression | 0.736739 | Akaike info criterion | | 2.242006 |
| Sum squared resid | 174.7766 | Schwarz criterion | | 2.299957 |
| Log likelihood | -361.5681 | Hannan-Quinn criter. | | 2.265130 |
| F-statistic | 136.1972 | Durbin-Watson stat | | 2.018798 |
| Prob(F-statistic) | 0.000000 | | | |

### 3.5. T Test Analysis

The T test aims to test the effect of all independent variables on the dependent variable partially. The T test is used with a significance level of 0.05. According to Ghozali (2018) the basis for decision making is as follows:

1) If the t-statistic value> t-table value or probabilistic value <0.05, then the independent variable individually (partially) affects the dependent variable.
2) If the t-statistic value < t-table value or probabilistic value> 0.05, then the independent variable individually (partially) does not affect the dependent variable.

Based on the hypothesis testing results of equation I available in table 2, the following conclusions can be drawn:

1) The Financial Literacy variable (X1) has a t-statistic value of 0.0036 < t-table value of 1.9679 with a probability value of 0.9971 > 0.05. This means that partially, Financial Literacy has no effect on Risk Preference. Then $H_1$ is rejected.
2) The Cognitive Bias variable (X2) has a t-statistic value of 0.9849 < t-table value of 1.9679 with a probability value of 0.3254> 0.05. This means that partially, Cognitive Bias has no effect on Risk Preference. So $H_2$ is rejected.
3) The Emotional Bias variable has a t-statistic value of 17.5847> t-table value 1.9679 with a probability value of 0.0000 <0.05. This means that partially, Cognitive Bias has a positive effect on Risk Preference. Then $H_3$ is accepted.

Based on the hypothesis test results of equation II available in table 3, the following conclusions can be drawn:

1) The Financial Literacy variable (X1) has a t-statistic value of 4.8854> t-table value of 1.9679 with a probability value of 0.0000 <0.05. This means that partially, Financial Literacy has a significant positive effect on Investment Decisions. Then $H_4$ is accepted.
2) The Cognitive Bias variable (X2) has a t-statistic value of 5.8827> t-table value of 1.9679 with a probability value of 0.0000 <0.05. This means that partially, Cognitive Bias has a significant positive effect on Investment Decisions. Then $H_5$ is accepted.
3) The Emotional Bias variable (X3) has a t-statistic value of 0.7297 < t-table value 1.9679 with a probability value of 0.4661> 0.05. This means that partially, Emotional Bias has no effect on Investment Decisions. Then $H_6$ is rejected.

4) The Risk Preference variable (Z) has a t-statistic value of 6.1003> t-table value of 1.9679 with a probability value of 0.0000 <0.05. This means that partially, Risk Preference has a significant positive effect on Investment Decisions. Then $H_7$ is accepted.

### 3.6. F Test Analysis

The F test aims to test the effect of all independent variables on the dependent variable simultaneously. The F test is used with a significance level of 0.05. According to Ghozali (2018) the basis for decision making is as follows:

1) If the F-Statistic value> F-Table or probability value <0.05 then the independent variable simultaneously affects the dependent variable.
2) If the F-Statistic value < F-Table or the probability value> 0.05 then the independent variable has no simultaneous effect on the dependent variable.

The results obtained from the F test in equation I show that the F-statistic value is 153.9743> 2.399 and the probabilistic value is 0.0000 < 0.05. This means that at a significance level of 5% or α 0.05 between Financial Literacy, Cognitive Bias and Emotional Bias simultaneously affect Risk Preference.

The results obtained from the F test in equation II show that the F-statistic value is 136.1972> 2.399 and the probability value is 0.0000 <0.05. This means that at a significance level of 5% or α 0.05 between Financial Literacy, Cognitive Bias, Emotional Bias and Risk Preference simultaneously affect Investment Decisions.

### 3.7. Sobel Test

The Sobel test aims to test whether the mediating variable has a significant mediating effect between the independent variable and the dependent variable (Mackinnon, Warsi, & Dwyer, 1995).

$$\boldsymbol{Z\ Value} = \frac{\boldsymbol{ab}}{\sqrt{((\boldsymbol{b^2})\boldsymbol{SEa^2} + ((\boldsymbol{a^2})\boldsymbol{SEb^2})}}$$

a = regression coefficient of the independent variable on the mediating variable
b = regression coefficient of the mediating variable on the dependent variable
SEa = standard error estimation of the impact of the independent variable on the mediating variable
SEb = standard error estimation of the impact of the mediating variable on the dependent variable.

In this study, the mediating or intervening variable Risk Preference can be said to mediate the independent variable (Financial Literacy, Cognitive Bias and Emotional Bias) on the dependent variable (Investment Decision), if the Z value > 1.96. The value of 1.96 is obtained from a significance level of 5% (2-way testing, left and right sides) and looking at the Z table. Sobel Test calculations can use the website program https://quantpsy.org/sobel/sobel.htm (Preacher, 2023).

Sobel Test Calculation Results:

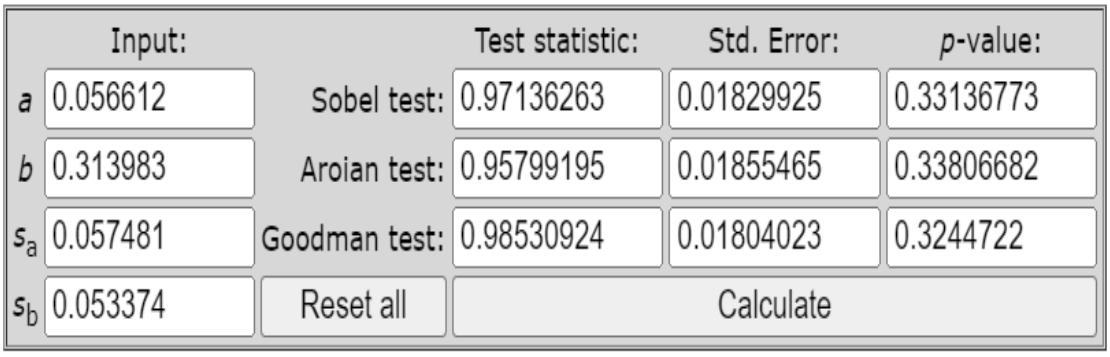
1. The Effect of Financial Literacy on Investment Decisions through Risk Preference

| Input: | | | Test statistic: | Std. Error: | *p*-value: |
|---|---|---|---|---|---|
| *a* | 0.000198 | Sobel test: | 0.00366097 | 0.0132495 | 0.99707898 |
| *b* | 0.244980 | Aroian test: | 0.00358661 | 0.01352422 | 0.99713831 |
| $s_a$ | 0.054084 | Goodman test: | 0.00374016 | 0.01296897 | 0.99701579 |
| $s_b$ | 0.050145 | Reset all | Calculate | | |

**Figure 1. The Effect of Financial Literacy on Investment Decisions through Risk Preference**
Source: processed on the website https://quantpsy.org/sobel/sobel.htm

The Z-value obtained is 0.0037 < 1.96, so it can be concluded that Risk Preference is not able to mediate the effect of Financial Literacy on Investment Decisions. Then $H_8$ is rejected.

2. The Effect of Cognitive Bias on Investment Decisions through Risk Preference

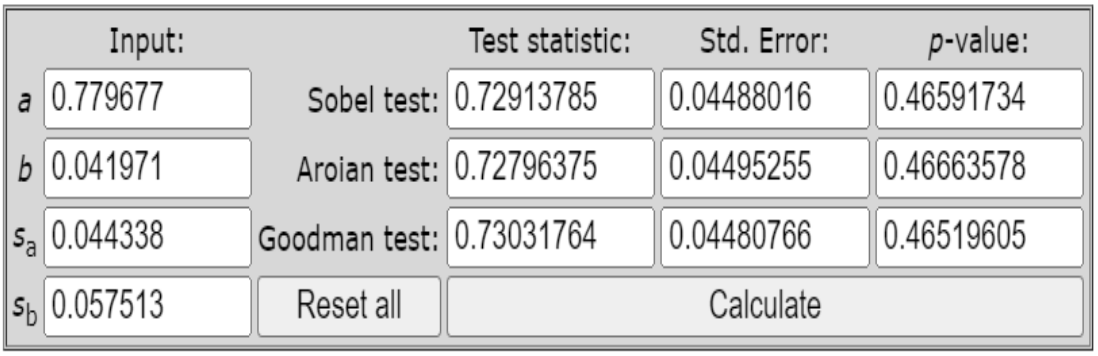


| Input: | | | Test statistic: | Std. Error: | *p*-value: |
|---|---|---|---|---|---|
| *a* | 0.056612 | Sobel test: | 0.97136263 | 0.01829925 | 0.33136773 |
| *b* | 0.313983 | Aroian test: | 0.95799195 | 0.01855465 | 0.33806682 |
| $s_a$ | 0.057481 | Goodman test: | 0.98530924 | 0.01804023 | 0.3244722 |
| $s_b$ | 0.053374 | Reset all | Calculate | | |

**Figure 2. The Effect of Cognitive Bias on Investment Decisions through Risk Preference**
Source: processed on the website https://quantpsy.org/sobel/sobel.htm

The Z-value obtained is 0.9714 < 1.96, so it can be concluded that Risk Preference is not able to mediate the effect of Cognitive Bias on Investment Decisions. Then $H_9$ is rejected.

3. The effect of Emotional Bias on Investment Decisions through Risk Preference



| Input: | | | Test statistic: | Std. Error: | *p*-value: |
|---|---|---|---|---|---|
| *a* | 0.779677 | Sobel test: | 0.72913785 | 0.04488016 | 0.46591734 |
| *b* | 0.041971 | Aroian test: | 0.72796375 | 0.04495255 | 0.46663578 |
| $s_a$ | 0.044338 | Goodman test: | 0.73031764 | 0.04480766 | 0.46519605 |
| $s_b$ | 0.057513 | Reset all | Calculate | | |

**Figure 3. The effect of Emotional Bias on Investment Decisions through Risk Preference**
Source: processed on the website https://quantpsy.org/sobel/sobel.htm

The Z-value obtained is 0.7291 < 1.96, so it can be concluded that Risk Preference is not able to mediate the effect of Emotional Bias on Investment Decisions. Then $H_{10}$ is rejected.

**1) Analysis of the Effect of Financial Literacy on Risk Preference**

The results of testing the first hypothesis show that Financial Literacy has no effect on Risk Preference or $H_1$ is rejected. This is because the relationship between financial literacy and risk preference may be more complex than assumed. Financial knowledge does not always directly translate into attitudes towards risk. Risk preferences may be more influenced by other psychological factors such as personal experience, personality, or cultural background, rather than financial knowledge alone.

This is in line with previous research by Chen, B. (2023), that there is a valley-shaped relationship pattern between actual financial literacy and risk preference. This suggests that higher levels of financial literacy do not necessarily translate into lower risk preferences, and vice versa. This pattern of relationship highlights the complexity of financial decision making and suggests that the relationship between financial literacy and risk preference is not linear.

However, this study is different from previous research from Gustafsson, C. (2015) which states that financial literacy has a significant influence on a person's risk preference and the higher a person's financial literacy, the higher their financial risk tolerance.

**2) Analysis of the Effect of Cognitive Bias on Risk Preference**

The results of testing the second hypothesis show that Cognitive Bias has no effect on Risk Preference or $H_2$ is rejected. This is because Cognitive Bias in this case over confidence does not affect risk preferences. Respondents consciously compensate for it in determining risk preferences and ignore risk preferences.

Different from the research of Yusnaini (2023), Enke, B., and Graeber, T. (2019), which proves a significant influence between Cognitive Bias and Risk Preference which can be seen from how cognitive uncertainty affects the way individuals assess risk and make economic decisions, but the positive and negative effects between variables cannot be ascertained.

**3) Analysis of the Effect of Emotional Bias on Risk Preference**

The results of testing the third hypothesis show that Emotional Bias in this case Loss aversion Bias (tendency to avoid losses) has a significant effect on Risk Preference or $H_3$ is accepted. This is because Loss aversion Bias reflects the human psychological tendency to be more sensitive to losses than equivalent gains. This directly affects how one perceives and assesses risk. This bias may also have evolutionary roots, where avoiding losses is more important for survival than gaining gains. This makes its influence on risk preferences very strong and consistent. Losses are often perceived more emotionally intense than gains, thus influencing future risk assessments.

This research is also in line with previous research by Ritika (2020) and Sapkota, M.P. (2022) which proves that there is a positive influence between Emotional Bias, namely loss aversion bias, on Risk Preference.

**4) Analysis of the Effect of Financial Literacy on Investment Decisions**

The results of testing the fourth hypothesis show that Financial Literacy has a significant positive effect on Investment Decisions or $H_4$ is accepted. This is because financial literacy provides an understanding of basic investment concepts such as risk, return, diversification, and the time value of money, which are very important in making investment decisions. Investors with good financial literacy are better able to analyze and interpret financial information, company reports, and market data to make more informed investment decisions. Financial literacy also allows investors to better evaluate various investment products and choose those that suit their financial goals.

This research is also in line with previous research by Suresh G (2021), Amari, M. (2015) and Gustafsson, C. (2015) which states that financial literacy has a significant influence on investment decisions.

**5) Analysis of the Effect of Cognitive Bias on Investment Decisions**

The results of testing the fifth hypothesis show that Cognitive Bias, in this case over confidence, has a significant positive effect on Investment Decisions or $H_5$ is accepted. This is because overconfident investors tend to underestimate investment risks, leading to overly aggressive investment decisions. Overconfidence can cause investors to overestimate their ability to choose investments or predict market movements which then trade too often which can increase transaction costs and reduce investment returns. Overconfidence can cause investors to focus too much on a few investments that they believe will perform well and ignore the principle of diversification.

This research is in line with previous research by Suresh G. (2021), Kartini (2021), Shah, F.S. (2021), Joshi, C., S (2022) and Silva, P. etc (2022) which prove a significant influence between Cognitive Bias and Investment Decisions. In contrast to the research of Yasmin, F. (2023), Kumar, S. (2014) and Aigbovo O., (2019), where behavioral biases including cognitive biases, affect investment decision making, but the effect tends to be negative.

**6) Analysis of the Effect of Emotional Bias on Investment Decisions**

The results of testing the sixth hypothesis show that Emotional Bias, in this case Loss aversion, has no effect on Investment Decisions or $H_6$ is rejected. This is because investors may already be aware of their loss aversion tendencies and actively compensate for them in the investment decision-making process. Increased financial literacy in West Kalimantan may have helped investors recognize and overcome their emotional biases, including loss aversion. In the use of analytical tools,

Investors may rely more on objective analytical tools and quantitative data in making decisions, reducing the influence of emotional biases.

This is different from previous research by Yasmin, F. (2023) and Silva, P. (2022) which proves that there is a significant and negative influence between Emotional Bias and Investment Decisions. In Sapkota's research, M.P. (2022) also states, emotional biases such as loss aversion bias have a negative influence on individual equity investment decisions.

**7) Analysis of the Effect of Risk Preference on Investment Decisions**

The seventh hypothesis testing results show that Risk Preference, in this case Risk Tolerance, has a significant positive effect on Investment Decisions or $H_7$ is accepted. This is because risk tolerance directly affects the composition of the investment portfolio, determining the allocation between high and low risk assets. In the selection of investment instruments, investors with high risk tolerance tend to choose investment instruments that are riskier but have the potential to provide higher returns, such as growth stocks or cryptocurrencies. Risk tolerance is often correlated with the investment time horizon, influencing decisions about when to enter or exit a particular investment.

This research is in line with previous research by Putri, A.N. (2022) and Gustafsson, C. (2015) which proves that there is a significant positive relationship between Risk Preference and Investment Decisions.

Individuals who have a higher level of financial literacy and higher risk tolerance tend to be more inclined to make risky investments. This suggests that good financial literacy and healthy risk tolerance can positively contribute to smarter and more informed investment decision making.

**8) Analysis of the Effect of Financial Literacy on Investment Decisions through Risk Preference as an Intervening Variable**

The results of testing the eighth hypothesis show that Risk Preference is unable to mediate the effect of Financial Literacy on Investment Decisions or $H_8$ is rejected. This is because financial literacy may have a strong direct influence on investment decisions, without the need to be mediated by risk preferences. In terms of relationship complexity, the relationship between financial literacy, risk preferences, and investment decisions may be more complex than can be explained by a simple mediation model. There may be other factors that are more significant in mediating the relationship between financial literacy and investment decisions. In this case, financial literacy and risk preference may affect investment decisions independently, without a significant mediation relationship.

**9) Analysis of the Effect of Cognitive Bias on Investment Decisions through Risk Preference as an Intervening Variable**

The results of testing the ninth hypothesis show that Risk Preference is unable to mediate the effect of Cognitive Bias on Investment Decisions or $H_9$ is rejected. This is because Overconfidence may have a strong direct influence on investment decisions, without having to go through risk preferences. There is an inconsistency between overconfidence and risk preferences where overconfidence can make someone take higher risks without changing their basic risk preferences. From the complexity of the relationship, the interaction between overconfidence, risk preferences, and investment decisions may be too complex to be captured by a simple mediation model. The effect of overconfidence on investment decisions may vary greatly between individuals, making the mediation effect difficult to detect at the population level.

**10) Analysis of the Effect of Emotional Bias on Investment Decisions through Risk Preference as an Intervening Variable**

The results of testing the tenth hypothesis show that Risk Preference is unable to mediate the effect of Emotional Bias on Investment Decisions or $H_{10}$ is rejected. This is because Loss aversion may have a significant direct influence on investment decisions, without having to go through risk preferences. In behavioral mechanisms, loss aversion operates through emotional mechanisms, while risk preferences are more cognitive, so the mediation relationship may not occur. In relationship complexity, the interaction between loss aversion, risk preference, and investment decision may be too complex to be captured by a simple mediation model. Also in temporal

inconsistency, loss aversion may affect investment decisions more directly and immediately, while risk preference may be more stable and long-term. The effect of loss aversion may be stronger in certain situations (e.g., when facing losses), while risk preference is more consistent.

## 4. Conclusions

1. The results of the T test (Partial Effect Test) in equation I state that the variables of Financial Literacy and Cognitive Bias partially have no positive influence on Risk Preference. While the Emotional Bias variable partially has an influence on Risk Preference. In equation II states that the variables of Financial Literacy, Cognitive Bias and Risk Preference partially have a positive effect on Investment Decisions, while the Emotional Bias variable partially has no effect on Investment Decisions.
2. The results of the F Test (Simultaneous Effect Test) in equation I state that the variables of Financial Literacy, Cognitive Bias and Emotional Bias simultaneously affect Risk Preference. In equation II states that the variables of Financial Literacy, Cognitive Bias and Emotional Bias simultaneously affect Investment Decisions.
3. The results of the Sobel Test explain that the Risk Preference variable is unable to mediate or intervene the effect of Financial Literacy, Cognitive Bias and Emotional Bias on Investment Decisions.
4. Risk Preference is more as a predictor than as a mediator.

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