



# Behavioural Biases and Investment Decisions through Gender and Education Perspectives in Indonesia Interbank Call Money Market

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**Abstract.** The interbank call money market plays an essential role in the financial system, whereby financial institutions and banks borrow and lend funds on a short-term basis from each other. In Indonesia's interbank money market, it is necessary to dig deeper into investor profiles and their relationship to investment decisions. This research investigates whether 11 behavioural biases (Availability, Hindsight, Representativeness, Overreaction, Conservatism, An-choring Adjustment, Confirmation Bias, Excessive optimism and overconfidence, Mental Accounting, Framing Effect, and Disposition Effect) and investment decisions have significant differences or not through gender and education perspectives. Thirty-two (32) respondents were sampled online through a questionnaire from Indonesian banking companies. Data were examined and analysed by nonparametric Mann-Whitney statistical analysis technique using SPSS as the statistical tool. The data revealed significant differences between men and women with excessive bias. Also, there is a significant difference between Diploma bachelor's and master's degrees in the excessive and disposition bias. While at investment decisions, there are no significant differences through gender and education perspectives.

**Keywords:** *investment decision, behavioural bias, interbank call money market.*

## 1 Introduction

Traditional finance theories often base their models on the assumption that market participants are rational and that they make decisions by maximising utility and profit. However, this assumption has been questioned by the emergence of behavioural finance 1 2, a field that incorporates psychological insights into financial decision-making processes 3. In the interbank call money market, an integral part of the financial system where banks lend and borrow short-term funds to meet their liquidity needs 4, understanding the role of behavioural biases in decision-making becomes particularly crucial 5. These decisions significantly impact the efficiency and stability of the financial system, making it essential to scrutinise the driving factors behind them. The Indonesian

interbank money market is a vital component of the financial system, which plays a role in facilitating the lending of funds between financial institutions and banks in Indonesia. In this market, investment decisions made by investors significantly impact market liquidity, interest rates, and overall financial system stability 6. Previous studies have identified factors influencing investment decisions in the interbank money market, such as economic factors, monetary policy, and regulations 7. However, there still needs to be more in-depth re-search on investor profiles and how individual factors, such as demographic characteristics 8, financial knowledge 9, investment experience 10, and risk preferences 11, relate to investment decisions in Indonesia's interbank money market. In addition, behavioural biases, such as availability, hindsight, representativeness, overreaction, conservatism, anchoring and adjustment, confirmation bias, excessive optimism and overconfidence, mental accounting framing effect and disposition bias 5, have influenced financial decision-making processes profoundly. Investment behaviours have been studied across various demographic factors, including gender 12 and level of education 13. Both genders had varying preferences in making similar decisions 14. Education also plays a significant role in investment decisions. A study 10 found that education significantly affects investment decisions. As such, it is crucial to consider them, as well as demographic factors such as gender and education, to gain a comprehensive view of behavioural influences on investment decisions in this market. However, while research has been done on behavioural biases and the interbank money market separately, only some have combined the two to analyse the impact of behavioural biases on decisions in the interbank call money market, especially within the Indonesian context. This study bridges these gaps, providing new insights that may contribute to more effective regulatory practices and financial stability. Thus, this paper aims to answer the following research questions:

1. Are there significant differences in investment decisions based on a gender and educational perspective?
2. Are there significant differences in behavioural bias based on gender and educational perspective?

## **2 Method**

### **Research Design**

This type of research is quantitative and conducted as part of primary research. The questionnaire was structured in this study, and respondents were given several choices. Therefore, two scales are used in this questionnaire: the nominal scale and the interval scale. The interval scale used to measure each variable in this study is the Likert scale<sup>15</sup>, which means strongly agree, agree, neutral, disagree, and strongly disagree.

### **Sample**

The target population in this study is treasury officers in banks, including the Forex, Money Market, Securities and Derivatives trading, and structured product divisions,

who understand the investment and have at least one year of work experience in the interbank call money market. A sample of 32 treasury dealers was taken from various banking companies in Indonesia. The selection of treasury dealer officials was based on cost considerations and ease of obtaining data, as well as limiting the characteristics of the data. Samples were taken as non-probability using a purposive sampling technique<sup>16</sup>. This technique takes samples from the population based on specific criteria. In this case, the samples taken were treasury dealer officials at banking companies in Indonesia for two weeks, from April 17 to May 3, 2023.

#### **Data collection technique**

Method of collecting data with a questionnaire, ensuring confidentiality and anonymity of respondents, providing clear instructions, and designing relevant and structured questions to obtain accurate and valuable data for research. The survey method uses an electronic questionnaire using Google Forms.

#### **Data analysis technique**

The collected data will be analysed using statistical methods, primarily through the Mann-Whitney U test, a nonparametric test that compares differences between two independent groups when the dependent variable is ordinal or continuous but not normally distributed. In this case, the Mann-Whitney U test will investigate differences in behavioural biases and investment decisions between groups, such as male vs. female decision-makers or decision-makers with varying education levels. The analysis will be performed using the SPSS 20 software, a widely used tool for statistical analysis in social science research.

The parametric statistical method uses a t-test with several terms to analyse the two-sample test. However, if one of the conditions is not met, the t-test must be replaced with a nonparametric statistical test used explicitly for two free samples<sup>17</sup>.<sup>15</sup> states that two formulas are used for testing. Both formulas are used in the calculations because they will be used to find out which U (Mann-Whitney) price is minor. The smaller U value is used for testing and comparing with the U table. The formulation is as follows:

$$M1 = (m1.m2) + ((m1. (m1+1))/2) - L_1 \text{ dan } M2 = (m1.m2) + ((m2. (m2+1))/2) - L_2$$

Information:

$$m_1 = \text{number of samples 1} \quad m_2 = \text{number of samples 2}$$

$$M1 = \text{Number of ranks 1} \quad M2 = \text{sum of rank 2}$$

$$L_1 = \text{number of ranks in sample } m_1 \quad L_2 = \text{number of ranks in the sample } m_2$$

This research design, combining archival data analysis with survey methodology and utilising the Mann-Whitney U test for data analysis, will provide a robust framework to investigate the difference between behavioural biases and investment decisions based on gender and education in the Indonesian interbank call money market. Decision Criteria:

- If the probability (Asymp. Sig)  $\geq 0.05$ , then  $H_0$  is accepted.
- If the probability (Asymp. Sig)  $< 0.05$ , then  $H_0$  is rejected.

### 3 Results & discussions

#### 3.1. Descriptive statistics

The purpose of doing descriptive analysis is to determine the characteristics of each research variable. This section will explain the aspects of the data obtained.

**Table 1. Respondent Profile**

Profile	Men	Women	Not to answer
Sex	69%	31%	-
Education	Diploma (bachelor's degree) 59.40%	Master's degree 40.6%	Doctor (PhD) -
Investment Decision	65% agree	31.3% strongly agree	3.1% Neutral

At this point, a descriptive statistical analysis of the recorded profiles of 32 respondents was performed. By gender, the number of male respondents was higher than that of female respondents. For example, Table 1 shows that male respondents accounted for 69% (22 respondents), while female respondents accounted for 31% (10 respondents). By education, respondents were divided into two categories: For example, the results in Table 1 show that respondent's profile by education is 59.4% Diploma – bachelor's degree, and 40.6% master's degree. Mostly, questions about investment decisions are aligned with investors' investment goals. Results show that 65% of the respondents agree with their investment decisions, 31,3% agree with their investment decisions, and 3.1% are neutral with their investment decisions.

#### 3.2. Results of the Test on Differences in Investment Decisions with Perceptions of Gender (Sex) and Education

The results in Table 2 show no significant difference in investment decision-making based on male and female gender. The results of the Mann-Whitney test prove that there is no significant difference between men and women in terms of making investment decisions. This is evidenced by the Asymp value. Sig. (2-tailed)  $0.492 > 0.05$ , then  $H_0$  is accepted. These results are consistent with the research<sup>18</sup> that gender and sex do not affect investment decisions but differ with results<sup>19</sup>.

**Table 2. Results Test Investment Decision with Perception of Gender (Sex) and Education**

Test Statistics <sup>a</sup>	Sex	Education
Mann-Whitney U	96.000	115.500
Wilcoxon W	151.000	305.500
Z	-.686	-.370
Asymp. Sig. (2-tailed)	.492	.711

The results in Table 2 show no significant difference between those with bachelor's and master's degrees in making investment decisions in Indonesia's interbank money market. The results of the Mann-Whitney test prove that there is no significant difference between bachelor's and master's degrees in making investments. The Asymp value evidence this results Sig. (2-tailed)  $0.711 > 0.05$ , then  $H_0$  is accepted. This result differs from <sup>20</sup>, which shows that educational background significantly affects decision making.

### 3.3. Behavioral Bias in Gender and Education Perspective

Based on Table 3 below, there is a significant difference between men and women in the excessive bias. In contrast, for other biases, there is no difference in either male or female gender in the interbank money market in Indonesia. The Asymp value evidence results in excessive bias. Sig. (2-tailed)  $0.018 < 0.05$ , then  $H_0$  is rejected.

**Table 3. Results Behavioural Biases on Gender (Sex) and Education.**

Test Statistics <sup>a</sup>	Availability	Hindsight	Representative-ness	Overreaction	Conservatism	Anchoring Adjustment
Asymp. Sig. (2-tailed) Sex	.386	.502	.077	.603	.371	.469
Asymp. Sig. (2-tailed) Education	.921	.574	.127	.667	.486	.898
Test Statistics <sup>a</sup>	Confirmation	Excessive	Mental Accounting	Freemium Effect	Disposition	
Asymp. Sig. (2-tailed) Sex	.066	<b>.018</b>	.122	.237	.576	
Asymp. Sig. (2-tailed) Education	.563	<b>.040</b>	.287	.940	<b>.028</b>	

Differences in the level of excessive bias between men and women can be caused by various factors, which include social, psychological, and cultural differences. Social and cultural factors, specific cultures and social norms can influence individual behaviour and attitudes toward excessive bias. Based on Table 3, there is a significant difference between Diploma bachelor's and master's degrees in the excessive and disposition bias with significance 0.04 and 0.028. In contrast, for other biases, there is no difference in either a bachelor's or master's degree in the interbank call money market in Indonesia. Differences in excessive and dispositional bias at each level of education can be caused by financial knowledge and education, analytical and critical skills, access to information and resources, and awareness and self-awareness.

## 4 Conclusion

This study showed significant differences between men and women with excessive bias. In addition, there is a significant difference between bachelor's and master's degrees regarding excessive and disposition bias. When making investment decisions, there were no significant differences in gender and education level. Suggestions and implications for the government regarding gender and education in investment deci-

sion-making in interbank money markets include increasing financial awareness, encouraging financial inclusion, inclusive financial education pro-grams, training, mentoring support, and better research and data collection to formulate better policies.

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