



The Effect of Financial Literacy and Demographic Factors on Behavioral Biases of Investors During a Pandemic

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Abstract. The purpose of this study is to look at the impact of financial literacy and demographics on investor behavioral biases in Indonesia. Overconfidence, disposition effect, mental accounting, and herding bias were among the eight variables used in this study, which included four independent variables: financial literacy, age, occupation, and income, as well as four dependent variables: overconfidence, disposition effect, mental accounting, and herding bias. This is a sort of research that uses a quantitative technique to do basic research. The questionnaires were distributed to investors listed on the Indonesia Stock Exchange for this study. The findings reveal that gender and age influence overconfidence bias, that financial literacy and income level influence disposition, that financial literacy and age influence mental accounting, and that financial literacy and occupation influence herding prejudice.

Keywords: Financial behavior · demographic · financial literacy · behavioral biases

1 Introduction

Many factors affect a person in making an investment decision; one of them is behavioral finance. This financial behavior shows that there are times when investors get psychological and demographic effects in making investment decisions. These psychological factors will lead to irrational decisions that lead to bias.

At the beginning of 2020, all levels of society were affected by the Covid-19 pandemic. The impact of this pandemic is that many people end up investing in stocks with the thought that they will benefit from these stocks. These days, investment can be used as an activity to utilize the funds owned to meet future needs. Most people think how important it is to separate an emergency fund and an investment fund just in case of an emergency.

In the middle of 2020, Pom-Pom stocks began to be sold, where the company deliberately engineered the stocks so that the stock price increased rapidly by using artists as its brand ambassadors. The target of this pom-pom stock is investors with minimal knowledge of stocks and new investors.

There is a significant negative effect between the financial literacy variable on the bias disposition effect, implying that the increasing financial literacy will make investors will not be reluctant to hold stocks with poor performance [1]. Financial literacy has a significant positive effect on mental accounting, implying that a higher investor's financial literacy makes the investor with a mental accounting bias will have a more complex portfolio. Financial literacy also has a significant negative effect on herding bias because investors with a high level of financial literacy will not follow other investors without a clear analysis. Financial literacy has a significant negative effect on overconfidence, meaning that investors with a high literacy level are more confident than investors with a low literacy level [2]. Moreover, herding means investors with a high literacy level will not follow other investors in their decision-making.

Several studies revealed that there is a positive effect between the gender variable on the overconfidence bias, meaning that males have a high level of self-confidence compared to females [1–3]. Some studies did not find any effect of gender on herding bias [1, 2]. Meanwhile, research from [3] showed a significant positive effect on herding bias, meaning that males tend to follow other investors' decisions in investing. On the other hand some research revealed no significant effect on the disposition effect, meaning that both males and females are not reluctant to hold bad stocks and sell profitable ones [2, 3]. These studies have different results from [1], which stated that there is a significant positive effect on the disposition effect, meaning that males tend to sell profitable stocks and hold poor performing stocks compared to females. Gender has a significant negative effect on mental accounting, meaning that females end up making investment decisions by grouping funds into several assets [1]. Meanwhile, other research stated no significant effect between gender and mental accounting [2].

There is a significant positive effect between income levels on overconfidence, implying that investors with high-income levels tend to have excessive self-confidence compared to investors with low-income levels [2, 3]. While the different results from [4] show that there is no significant effect between the level of income on overconfidence, which means that high- or low-income levels do not affect self-confidence. Income levels have a significant negative effect on the disposition effect, which means that low-income levels tend to have this bias because they do not have facilities for financial consultants compared to high-income investors [4]. Meanwhile, some studies reveals no significant effect between income levels and the disposition effect, meaning that high or low levels of investor income will not affect them not to hold losing stocks [2, 3]. Income level found to have significant positive effect on mental accounting, meaning that investors with high-income levels tend to allocate their assets separately [4]. While the research results from [2] revealed no significant negative effect between income levels on mental accounting, meaning that high or low levels of investor income do not prevent them from allocating their assets separately before investing. Some studies revealed no significant effect between the level of income on herding bias, implying that high and low-income investors will follow the decisions of other investors if they do not get complete information about a stock [2–4].

Other studies revealed a negative and significant effect between age and herding bias, meaning that older investors tend to make decisions based on a majority vote or follow the decisions of other investors [1, 4]. Contrary to that, some studies revealed that age

has a significant positive effect on the disposition effect because older investors tend to sell profitable stocks and hold losers compared to younger investors [3, 4].

One study identified a positive and substantial relationship between work type and overconfidence, meaning that retired investors are more confident in their investment decisions than private employees [1]. Mental accounting means that retired investors have more complex portfolios than other employment sectors. The type of work has a significant negative effect on herding bias means that private employees are more likely to follow investors than other types of work. Because of the disposition effect, private workers are more likely than entrepreneurs to possess incorrect shares. Retired investors had a higher level of self-assurance than private employees. A skewed disposition effect is also common among private employee investors [1]. Other research, on the other hand, found that investors with finance jobs have a large negative influence on herding bias because they understand equities better and do not follow other investors in making judgments [4]. However, the research of [3] contradicts the results of [1] and [4] where the type of work has no effect on behavioral bias.

This research is important since the behavioral bias of each investor will show financial behavior that can be used as a determining factor in making investment decisions. The focus of this research will be on Indonesian investors that buy stocks on the Indonesian Stock Exchange. The results of this research will be used to determine the impact of demographic characteristics on behavioral bias in stock investment decisions.

Financial literacy is an understanding of public information that includes financial services, financial investments, and various financial perspectives that investors must understand [5] in [2]. Demographic factors are an inherent part of individuals and can affect decision-making.

Behavioral bias is financial behavior, consisting of knowledge of psychology, finance, and other sciences to study investor behavior that deviates from the standard [6] in [1]. Overconfidence is the behavior of investors who have excessive confidence in their knowledge of the capital market. Investors will tend to ignore information because of overconfidence. The disposition effect is the behavior of investors who sell profitable shares but hold detrimental shares [7]. Investors with this bias tend to avoid losses and regret the decisions taken. Mental accounting is the behavior of investors who separate income and expenses as in accounting. Investors with this bias tend to put their assets into different investments to not interfere with other investments. Herding bias is the behavior of investors who follow other investors in making investment decisions. Investors tend to follow other people's investment decisions when getting uncertain information [3, 8].

Investors with high financial or stock knowledge would have a lower level of excessive trust [9]. High financial literacy will prevent investors from making biased decisions.

H1a: Financial literacy has a negative effect on overconfidence bias

Investors with good financial knowledge would be more aware of losses in their portfolios, so they will not hold stocks that perform poorly [1].

H1b: Financial literacy has a negative effect on the disposition effect

Investors with good financial knowledge will increasingly separate their shares, such as the accounting model. Investors with this bias tend to have more complex portfolios than investors with low literacy levels [1].

H1c: Financial literacy has a positive effect on mental accounting

Investors with low financial knowledge tend to follow the decisions of other investors in their decision-making without analyzing the stock first [1].

H1d: Financial literacy has a negative effect on herding bias

Some studies found that males tend to have excessive self-confidence compared to females [3, 10]. Other research reveal that males tend to be more confident in the capital market compared to females [1].

H2a: Gender has a positive effect on overconfidence bias

Females are more likely to have a disposition effect than males, meaning that females are more daring to invest in large amounts if they have previously experienced profits [1].

H2b: Gender has a negative effect on the disposition effect

Male investors tend to be less biased toward mental accounting than females. Before investing, females tend to group into several assets, such as accounting models [1].

H2c: Gender has a negative effect on mental accounting

Males tend to be more prone to herding bias than females because males tend to follow the decisions of other investors such as relatives or family in making investment decisions [3].

H2d: Gender has a positive effect on herding bias

Investors with a high-income level have higher self-confidence than investors with a low-income level [2].

H3a: Income level has a positive effect on overconfidence bias

Investors with a low-income level tend to be insecure and avoid risk if they have experienced losses [11].

H3b: Income level has a negative effect on the disposition effect

Investors with a high-income level tend to have more complex portfolios than investors with a low-income level [4].

H3c: Income level has a positive effect on mental accounting

Investors with a low-income level are less susceptible to herding bias because the capital used is small, so before making decisions, they will be carefully thought out and considered first [12].

H3d: Income level has a negative effect on herding bias

Older investors tend to have higher self-confidence than investors at a young age because of their understanding of investment performance [13].

H4a: Age has a positive effect on overconfidence bias

Young investors (25–45 years old) who lack experience are more reluctant to be aware of losses in their portfolios [3]. While other research [4] found that older investors tend to hold down stocks that suffer losses for a longer time and sell profitable stocks.

H4b: Age has a negative effect on the disposition effect

Older investors tend to separate their investments to build complex portfolios [14].

H4c: Age has a positive effect on mental accounting

Some studies found that young investors are more careful in making decisions to discuss their investment decisions with their relatives [1, 4]. Older investors tend not to ask for recommendations or references from those around them [4].

H4d: Age has a negative effect on herding bias

Investors with jobs related to finance will be more confident in making investment decisions [4].

H5a: Type of work has a positive effect on overconfidence bias

There is an effect of type of work on the bias disposition effect [3, 11]. Investors who have jobs related to finance tend to have a low bias disposition effect.

H5b: Type of work has a negative effect on the disposition effect

The type of work has an effect on mental accounting bias [1]. Investors who retire from work tend to be less susceptible to mental accounting. Investors who have jobs related to finance tend to have mental accounting because they know about investment [4].

H5c: Type of work has a positive effect on mental accounting

Investors whose work is not related to finance tend to experience herding bias more than investors who work in finance [15].

H5d: Type of work has a negative effect on herding bias

2 Research Methods

This research is included in the basic research type, which aims to increase and expand knowledge. Based on its objectives, this research is classified as a causal research type since it explains the effect of the dependent variable, behavioral bias, and the independent variable, financial literacy, and demographic factors. This research was conducted with quantitative methods. The data used were collected through questionnaires distributed by researchers and filled out by respondents. The questionnaire results were then analyzed using the SEM (Structural Equation Modeling) analysis method assisted by SPSS and AMOS software. SPSS was used to test the reliability and validity, while AMOS was used to test the fit model and the hypothesis.

The variables in this study were separated into four dependent and five independent variables. Investor behavior bias, specifically overconfidence, disposition effect, mental accounting, and herding bias, were the dependent variables in this study. While the study's independent variables were financial literacy and demographic parameters such as gender, income level, age, and type of job, the dependent variables were gender, income level, age, and type of work. The types and sources of data used in this study were primary data gathered directly from investors who invest in shares listed on the Indonesia Stock Exchange through the distribution of questionnaires (IDX). Investors who invest in shares listed on IDX made up the study's population. The non-probability sampling method was employed to obtain data in this study. Because this study includes five construct variables: financial literacy, overconfidence, disposition effect, mental accounting, and herding bias, it requires at least 100 respondents.

3 Results and Discussion

The study used data from the distribution of questionnaires to 205 respondents. SPSS software version 25 was used for validity and reliability testing. The validity testing results show that all indicators met the requirements, namely $r\text{-count} > r\text{-table}$. Meanwhile, the reliable testing results show that all indicators met the requirements, namely $>$

0.6. Furthermore, the measurement model test was assisted using AMOS software version 24. The measurement model was tested for feasibility, and the results show that LK5, LK6, DE2, and DE4 did not meet the validity test requirements, so the 4 indicators were eliminated. After eliminating the validity test results indicators on the measurement model, all indicators meet the requirements with the value > 0.5 .

This test was carried out with the help of IBM SPSS AMOS 24 software which tested 20 hypotheses. The probability value (p) is used to see whether there is an influence between the independent variables on the dependent variable with the condition that the value of 0.050 means that the independent variable has an influence on the dependent variable.

The results of the 20 hypotheses tested show 8 hypotheses have a significant effect, namely the H1b, H1c, H1d, H2a, H3b, H4a, H4c, and H5d. Furthermore, H1a, H2b, H2c, H2d, H3a, H3c, H3d, H4b, H4d, H5a, H5b, and H5c have no significant effect.

Financial literacy on the disposition effect has a significant negative relationship. During a pandemic, a lower investor's level of financial literacy will tend to have a biased disposition effect. This is supported by research by [1]. Investors with a low level of understanding tend to sell profitable stocks because they do not understand or study them in-depth. Financial literacy on mental accounting has a significant positive relationship, which means that during a pandemic, investors with a high understanding of finances will allocate their assets and record expenses and income received so that they do not interfere with other financial activities. This result in-line with [1]. Financial literacy on herding bias has a significant negative relationship, which means that investors with a low level of financial literacy tend to follow the investment decisions of others who are successful in the investment field because of their low level of financial literacy. This is supported by [2].

Overconfidence and gender have a large positive link, which suggests that men investors are more confident than female investors during a pandemic because males believe they have financial knowledge. This is supported by several research [1, 3, 10, 13, 16]. Male investors dare to take risks and their investment decisions compared to women.

Investors with low income levels are more likely to be unconscious of owning terrible stocks for a long period during a pandemic than investors with high income levels, implying that during a pandemic, investors with low income levels are more likely to be unaware of keeping bad stocks for a long time. This is supported [4, 11]. Investors with high-income levels tend to consult financial advisors, so they will not hold bad stocks for a long time.

Age and overconfidence have a significant positive relationship, which means that during a pandemic, older investors ages tend to have higher self-confidence because they feel they have more experience and knowledge of the capital market compared to younger investors. This is supported by [17, 18]. Age on mental accounting has a significant positive relationship, which means that older investors tend to be more able to allocate their income and expenses, so they do not interfere with other investments. This is supported by [2].

The type of work on herding bias has a significant negative relationship, which means that during a pandemic, investors with jobs not related to finance tend to ask for opinions

or follow the decisions of other investors before making investment decisions because they are less familiar with investing compared to investors with jobs related to finance. This is supported by some studies [1, 3, 4], Baker et al. [1], and Beatrice et al. [4]. Investors who have jobs related to finance will better understand the capital market and study prospective stocks so that they do not follow the decisions of other investors.

4 Conclusion

The findings reveal that each dependent variable is influenced by at least one demographic component. In testing the hypothesis, it was discovered that gender and age have an impact on overconfidence bias. Financial knowledge and income level have an impact on the disposition effect bias. Financial literacy and age have an impact on mental accounting behavior bias. Meanwhile, financial knowledge and the nature of work increase herding prejudice.

Investors need to recognize and consider their own behavioral biases and types of risk to be ready to face the capital market during a pandemic. Financial advisors should improve and study their understanding of the capital market, especially during a pandemic like this, to minimize losses suffered by their clients. Further researchers can add other demographic factors such as marital status or ethnicity related to demographic factors.

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