

The Role of Financial Literacy and Demographic Variables in Influencing Behavioral Biases

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ABSTRACT

This study aims to analyze the influence of financial literacy and demographic factors on investors' behavioral biases in the capital market, including disposition effect, herding, mental accounting, overconfidence, and representativeness. The research employed a quantitative approach by distributing questionnaires to 152 respondents using purposive sampling. Data were analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS software. The findings indicate that financial literacy has a significant effect on all tested behavioral biases, while demographic factors show no significant effect on most biases. These results highlight that a higher level of financial literacy can help investors reduce the tendency to fall into behavioral biases when making investment decisions.

INTRODUCTION

Investment is a flow of capital used to realize productive goals. Investment is highly emphasized as the main instrument of economic growth and development for a country (Sarkar & Sahu, 2018). Investment contributes positively to state revenue. This means that the smoother and easier the investment process will be, making investment activities will increase, which ultimately encourages an increase in state revenue (Al-Tsaman & Ain', 2021). Investment in the financial sector plays a role in the formation of national capital assets. From a long-term perspective, this activity is crucial in encouraging production efficiency and strengthening the competitive potential of an economic system. (Sarkar & Sahu, 2018).

One of the main attractions of investing is the relatively high profit potential. However, the decision to invest also requires careful consideration due to the risks that investors must face. Investors' decisions to invest are triggered by various factors, including financial literacy levels, behavioral biases, and demographic variables. Variables such as age, gender, education level, income, and employment status can play a role in shaping an investor's knowledge, experience, and risk tolerance (Sabela, 2020)

Financial literacy and demographic variables affect behavioral bias in an investor. Financial literacy is the capacity of individuals to understand and utilize finance-related information needed to make wise decisions (Atkinson, 2012). Financial literacy is very important because poor financial decisions can be fatal for individuals and groups. Financial literacy skills also function as a significant means of supporting to minimize the risk of biased decision-making and assist investors in making rational choices. Jappelli and Padula (2013) stated that investors' lack of insight into basic economic and financial concepts, such as financial behavior, risk diversification strategies, inflation, and interest distribution systems, increases the potential for investment decision-making bias. Making mistakes can lead to suboptimal financial management, which ultimately makes people more vulnerable to financial crises and at risk of losses.

Over the past few years, the level of financial literacy of the Indonesian people has shown an increasing trend. Referring to a survey conducted by the Financial Services Authority (OJK) in 2019, the level of financial literacy was recorded at 38%, which reflects the low financial understanding of the public at that time. Furthermore, in 2022, the results of the OJK survey show an increase of 11% to 49%. The latest survey conducted in 2024 noted that the financial literacy rate has increased again to reach 65%. This literacy level varies depending on the demographic characteristics of each individual (Ningtyas, 2019).

Demographic variables such as gender, age, education, income, experience, and employment have a significant influence on a person's financial literacy and investment decision-making. Bernheim (1998) shows that individuals with higher education tend to have a better understanding of financial concepts. This shows that demographics not only affect access to financial information, but also an individual's ability to process that information.

Currently, there is a growing body of literature that shows that financial knowledge is needed to improve consumer behavior related to financial products or services. Some studies such as Lusardi and Messy (2023) focus on financial literacy or investor knowledge. There are still other studies that use demographic characteristics to differ from investor behavior (Salim & Setyawan, 2023). However, little literature addresses how financial literacy and various demographic variables relate to behavioral bias.

In this study, investment decision-making methods will be analyzed covering various aspects, ranging from financial literacy, demographic factors and behavioral bias. These aspects often arise as a result of a lack of understanding or lack of accurate information. This research variable will later play an important role in providing the knowledge needed to reduce negative impacts in investment decision-making in Yogyakarta.

LITERATURE REVIEW

Financial literacy is an individual's ability to understand, manage, and utilize financial information to produce the right decisions in daily life. According to OJK (2017), financial literacy includes knowledge, skills, beliefs, and attitudes that can encourage better financial behavior, such as budgeting, saving, investing, and avoiding consumptive debt. Some previous studies (Lusardi & Mitchell, 2014; Setiawan, 2020) shows that high levels of financial literacy have a positive relationship with healthy financial behavior, especially in terms of income management and future planning. However, there are also studies that find that financial literacy is not necessarily directly proportional to financial behavior, because external factors such as lifestyle and social environment also affect (Putri & Nugroho, 2021).

Lifestyle is understood as a lifestyle that is reflected in individual activities, interests, and opinions (Kotler, 2016). This concept is further explained through the AIO (Activities, Interests, Opinions) theory which emphasizes that a person's consumption preferences are shaped by how they spend their time, what they are interested in, as well as how they view a trend or product. Generation Z, who live in the digital and social media era, tends to have a consumptive lifestyle influenced by online trends, advertising, and peer groups. Previous research (Pradana, 2020; Amelia, 2022) found that a consumptive lifestyle has a negative effect on financial behavior, for example by increasing impulsive spending tendencies. However, a productive lifestyle, such as focusing on education, health, or investment, can actually improve financial behavior.

Religiosity is understood as the level of appreciation and practice of religious values in daily life. Glock & Stark (1965) stated that religiosity includes the dimensions of beliefs, religious practices, experiences, knowledge, and consequences. In the financial context, religiosity is believed to limit excessive consumptive behavior and encourage a person to be more careful in managing money, for example by avoiding extravagant behavior, choosing halal transactions, and setting aside some income for almsgiving. Several studies (Astuti, 2019; Sari & Fitria, 2021) proves that religiosity is able to moderate the

influence of lifestyle on financial behavior, because religious values can be an internal control in making economic decisions.

Financial behavior itself is defined as a person's real actions in managing their finances, which is reflected in the ability to prepare a budget, save, provide emergency funds, and use credit wisely (Xiao, 2008). Several studies have found that financial literacy and lifestyle have a significant influence on financial behavior, but the power of influence is often influenced by moderation factors, one of which is religiosity. Therefore, this study emphasizes the importance of examining the relationship between financial literacy, lifestyle, and religiosity simultaneously on the financial behavior of Generation Z in Yogyakarta, considering that this age group is vulnerable to consumptive trends while forming long-term financial management patterns.

METHODOLOGY

This study uses a quantitative approach with a type of causal associative research, namely to determine the influence of financial literacy and lifestyle on the financial behavior of Generation Z with religiosity as a moderation variable. The research population is all generation Z living in Yogyakarta in the period 2024–2025 with an age range of 13–28 years. The sampling technique used purposive sampling criteria for respondents including generation Z, domiciled in Yogyakarta, and adhering to certain religions. The number of samples was determined using the Roscoe guideline, which is a minimum of 25 times the number of variables. With four variables, the minimum sample was 100, but to improve accuracy, 200 respondents were used.

The data used is primary data obtained directly from respondents through an online questionnaire (Google Form). The research instrument uses a five-point Likert scale to measure the variables studied. The independent variables are financial literacy (X1) and lifestyle (X2), the dependent variables are financial behavior (Y), and the moderation variable is religiosity (M).

The data analysis technique uses multiple linear regression analysis with the help of the SPSS version 25 program. The analysis stages include validity, reliability, classical assumption tests (normality, multicollinearity, heteroscedasticity), regression analysis, t-test, F test, and determination coefficient (R^2) test. To test the influence of moderation religiosity, Moderated Regression Analysis (MRA) was used.

RESEARCH RESULT

Testing Measurement Model (Outer Model)

Validity Test Results

In the early stages of data processing, it is carried out by testing the validity of each instrument used in the research. This test aims to ensure that each statement item can represent the construct in question. The validity process is carried out with two types of tests, namely convergent validity and discriminant validity.

Convergence of Validity

Table 1. Outer Loading Results

	DEMOGRAFI	DE	HE	LK	MA	OS	REP
DE 1		0.728					
DE 2		0.761					
DE 3		0.722					
HD 1			0.737				
HD 2			0.736				
HD 3			0.729				
HD 4			0.71				
HD 5			0.833				
LK 4				0.812			
LK 6				0.883			
LK 7				0.864			
MA 1					0.828		
MA 2					0.588		
MA 3					0.839		
OS 1						0.821	
OS 2						0.68	
OS 3						0.705	
OS 4						0.66	
OS 5						0.63	
OS 6						0.763	
PR 2	0.851						
PR 3	0.608						
PR 5	0.725						
PR 6	0.874						
REP 1							0.841
REP 2							0.868
REP 3							0.786

Based on the results of the Outer Loading test shown in Table 4.8, it can be concluded that most items have values above 0.7, which indicates that they are valid for measuring the variables in question. Although there are some items with values below 0.7. According to Hair et al. (2017) the value is still acceptable as long as the Composite Reliability (CR) exceeds 0.7 and the Average Variance Extracted (AVE) is above 0.5. From the processing results, there were 12 question items that had an Outer Loading value below 0.6, and were not in accordance with the rules according to Hair et al. (2017), so they needed to be eliminated because they did not meet the criteria for convergent validity. These items consist of PR1, PR 4, LK1, LK2, LK3, LK5, LK8, LK9, LK10, LK11, LK12, and LK13. The results of Outer Loading obtained from the PLS Algorithm are shown in Figure 4.1 below.

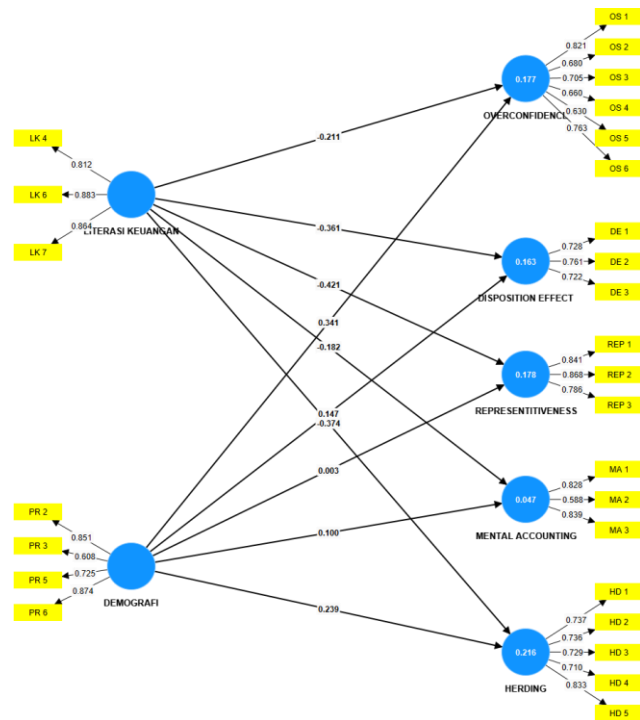


Figure 1. PLS Algorithm Results

Furthermore, to assess the validity of the convergence in more depth, the Average Variance Extracted (AVE) value was tested for each variable. The results of the test are presented in detail in Table 4.9, which shows how far the construct indicator can reveal the variance.

Table 2. Avarage Variance Extracted (AVE) Results

Variabel	AVE
PR	0.596
DE	0.544
HD	0.563
LK	0.729
MA	0.578
OS	0.508
REP	0.693

Referring to the results of the Average Variance Extracted (AVE) test in Table 4.9, it was concluded that all variables in this study had an AVE value of more than 0.5. This value indicates that each variable is able to explain a considerable proportion of variance from the indicators that represent it. Therefore, all constructs used in this study have met the criteria for convergent validity so that they can be declared valid.

Discriminatory Validity

Table 3. Fornell-Larcker results

Variabel	PR	DE	HD	LK	MA	OS	REP
PR	0.772						
DE	0.185	0.737					

HD	0.279	0.234	0.75				
LK	-0.108	-0.376	-0.4	0.854			
MA	0.119	0.295	0.208	-0.192	0.76		
OS	0.364	0.223	0.331	-0.248	0.255	0.713	
REP	0.048	0.121	0.439	-0.422	0.133	0.203	0.832

Based on the results of the Fornell-Larcker test shown in Table 4.10, it can be seen that each construct has a higher square root value of Average Variance Extracted (AVE) compared to the correlation between other constructs in the same column, so it is concluded that the criterion of discriminant validity has been met. Furthermore, the results of the Heterotrait-Monotrait Ratio (HTMT) test of each construct are presented in Table 3.

Table 4. Result of Heterotrait-Monotrait Ratio (HTMT)

Variabel	PR	DE	HD	LK	MA	OS	REP
PR							
DE	0.294						
HD	0.333	0.319					
LK	0.213	0.521	0.475				
MA	0.164	0.479	0.31	0.231			
OS	0.352	0.314	0.369	0.267	0.301		
REP	0.103	0.187	0.558	0.526	0.179	0.252	

Referring to the results of the Heterotrait-Monotrait Ratio (HTMT) test shown in Table 4., all constructs in this study show values below 0.9. This value indicates that each construct has a clear difference from other constructs, so that there is no overlap in the measurement. Thus, it can be concluded that all constructs have met the criteria of discriminant validity and are declared valid in this research model.

Reliability Test Results

Table 5. Reliability Test Results

Variabel	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Information
PR	0.785	0.869	0.853	Reliabel
OF	0.588	0.583	0.781	Reliabel
HD	0.806	0.811	0.865	Reliabel
P.	0.816	0.84	0.889	Reliabel
BUT	0.663	0.715	0.801	Reliabel
THE	0.818	0.91	0.86	Reliabel
REP	0.779	0.793	0.871	Reliabel

According to the results of the reliability test presented in Table 4.12, all variables of this study showed Cronbach's alpha, composite reliability (rho_A), and composite reliability (rho_C) values above the minimum values

recommended for exploratory studies. Most of Cronbach's alpha and rho_A values are above 0.6, even close to or exceeding 0.7, which shows that the construct used has met the requirements of internal consistency.

Hair et al. (2020) stated that a reliability value in the range of 0.6 to 0.7 is still acceptable in exploratory research because it aims to develop a measurement model. This is reinforced by the statement of Nunnally et al. (1976) who stated that in the early stages of the study, a reliability coefficient of 0.5 or 0.6 can still be tolerated. Therefore, even if there is one variable, namely DE with Cronbach's alpha value and rho_A slightly below 0.6, this value is still acceptable in the context of this exploratory study, especially since the composite reliability (rho_C) value still exceeds 0.7. Thus, all constructs in this model are declared reliable.

Structural Model Testing (Inner Model)

Path Coefficient Test Results (ρ)

The path coefficient test is a follow-up step after the collinearity test is carried out. At this stage, the analysis is focused on evaluating the direction and magnitude of the influence between latent variables according to the hypothesis that has been formulated previously. The path coefficient value is obtained through the bootstrapping process, which is used to test the significance of the relationships between variables. A relationship is declared significant if it has a t-statistic value above 1.96 and a p-value that does not reach 0.05. The complete results of the path coefficient test are shown in Table 6.

Table 6. Path Coefficient Test Results

Variabel	T statistics	P values	Information
PR → OF	1.742	0.082	Insignificant
PR → HD	3.472	0.001	Accepted and significant
PR → MA	1.226	0.220	Insignificant
PR → OS	5.518	0.000	Accepted and significant
PR → REP	0.035	0.972	Insignificant
IN THE → FIRST	4.030	0.000	Accepted and significant
LK → HD	5.144	0.000	Accepted and significant
PAGE → MA	2.177	0.030	Accepted and significant
LK → OS	2.731	0.006	Accepted and significant
LK → REP	5.053	0.000	Accepted and significant

Based on the results of the path coefficient test shown in table 4.13, it is concluded that there are 5 accepted hypotheses and significant of the 6 hypotheses proposed. The five accepted hypotheses consist of H1, H2, H3, H4, and H6. The following is an explanation of each hypothesis:

1. In the Hypothesis 1 (H1) test, which revealed that financial literacy (LK) had an effect on the bias disposition effect (DE) on individual investors. The t-statistic value is 4.030 and the p-value is 0.000. The t-statistical value that is above 1.96 and the p-value below 0.05 is considered to meet the criteria for the path coefficient test, so Hypothesis 1 is accepted because of the significant

analysis results. This means that financial liquidation has a significant influence on the bias disposition effect.

2. In the Hypothesis 2 (H2) test, which revealed that financial literacy (LK) had an effect on mental accounting bias with the results of the analysis of t-statistical value of 2.177 and p-value of 0.030. A t-statistic value that is above 1.96 and a p-value of less than 0.05 is declared to meet the criteria for the path coefficient test, so Hypothesis 2 is accepted as significant. This means that financial literacy has a significant influence on the mental bias of accounting.
3. In the Hypothesis 3 (H3) study, which revealed that investment experience (PR) had an effect on overconfidence bias (OS) in individual investors with the results of the analysis of the t-statistical value of 2.731 and the p-value of 0.006. The t-statistic value that is above 1.96 and the p-value is less than 0.05 is declared to meet the path coefficient test criteria, so Hypothesis 3 is accepted as significant. This means that investment experience has a positive effect on overconfidence bias in individual investors.
4. In the Hypothesis 4 (H4) test, which reveals demographics (PR), in this case gender, affects overconfidence bias (OS) with the results of the analysis of t-statistical value of 5.518 and p-value of 0.000. The t-statistical value that is above 1.96 and the p-value is less than 0.05 is declared to meet the criteria for the path coefficient test, so Hypothesis 4 is accepted as significant. This means that male investors tend to have a higher level of overconfidence than female investors.
5. In the testing of Hypothesis 5 (H5), which reveals demographics (PR), in this case the level of education, has an effect on representativeness bias (REP) with the results of the analysis of the t-statistical value of 0.035 and the p-value of 0.972. The t-statistics value is below 1.96 and the p-value is above 0.05 and does not meet the criteria for the path coefficient test, so Hypothesis 5 is not accepted because it is not significant. This means that there is no significant influence between education level and the tendency to biased representativeness in individual investors.
6. In the testing of Hypothesis 6 (H6), which reveals demographics (PR), in this case the age of the investor, affects herding bias (HD) with the results of the analysis of the t-statistical value of 3.472 and the p-value of 0.001. The t-statistic value that is above 1.96 and the p-value is less than 0.05 is declared to meet the criteria for the path coefficient test, so Hypothesis 6 is accepted as significant. Age has a significant influence on herding bias and that is, older investors have a lower tendency to show herding bias compared to younger investors.

The results of the path coefficient obtained from the bootstrapping process are shown in Figure 2. below.

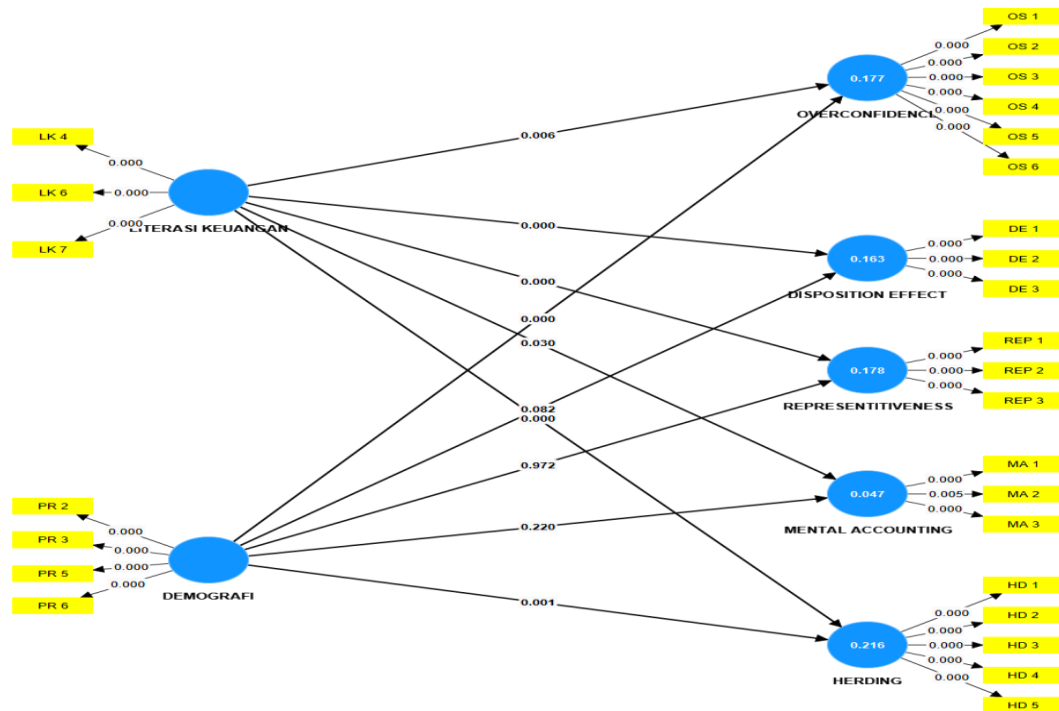


Figure 2. Bootstrapping Results

Determination Coefficient Test Results (R-Square/R2)

The purpose of the determination coefficient test is to evaluate the extent to which independent variables can explain the variations that occur in dependent variables. The resulting R-Square value can be classified into weak, medium, or strong categories depending on its magnitude. The complete results of the determination coefficient test are shown in Table 7.

Table 7. R-Square Test Results

	<i>R-square</i>	<i>R-square adjusted</i>
DE	0.163	0.151
HD	0.216	0.205
MA	0.047	0.033
OS	0.177	0.165
REP	0.178	0.166

Based on the results of the determination coefficient test shown in Table 7, it is known that the independent variables in this study have a relatively weak ability to explain the dependent variables. The highest R-Square value was found in the Herding variable (HD) of 0.216, which shows that 21.6% of herding variability can be explained by demographics and financial literacy, while 78.4% is triggered by other factors. The Disposition Effect (DE) variable had an R-Square value of 0.163, Overconfidence (OS) of 0.177, and Representativeness (REP) of 0.178, all of which showed a low level of explanation. The lowest value is found in the Mental Accounting (MA) variable of 0.047, which means that only 4.7% of the variation in this construct can be explained by the model. Nonetheless, the model still shows a statistically explainable relationship.

Effect Size Test Results (f²)

The effect size test was carried out to assess the magnitude of the influence of each independent variable on the individual dependent variables. The value of the effect size is classified into three categories, namely small, medium, and large. The greater the value produced, the stronger the potential for independent variables to partially expose dependent variables. The complete results of the effect size test are presented in Table 8

Table 8. Effect Size Results

Variabel	PR	DE	HD	LK	MA	OS	REP
PR		0.025	0.072		0.01	0.14	0
DE							
HD							
LK		0.154	0.176		0.034	0.054	0.213
MA							
OS							
REP							

Referring to the results of the effect size test presented in Table 4.15, it is concluded that independent variables in the model have a varied effect on each dependent variable. The effect size value of demographics (PR) on Disposition Effect (DE) was 0.025, on Herding (HD) was 0.072, on Mental Accounting (MA) was 0.01, on Overconfidence (OS) was 0.14, and on Representativeness (REP) was 0.00. Of these values, only the influence on Overconfidence is close to the medium category, while others are included in the small category or have no effect at all.

The effect size value of financial literacy (LK) on Disposition Effect (DE) was 0.154, on Herding (HD) was 0.176, on Mental Accounting (MA) was 0.034, on Overconfidence (OS) was 0.054, and on Representativeness (REP) was 0.213. Based on the criteria of Cohen, (1988), the influence of financial literacy on Herding, Disposition Effect, and Representativeness is included in the medium category, while the influence on Mental Accounting and Overconfidence is included in the small category. Although most of the effect size values are relatively small to moderate, these results still show that demographic variables and financial literacy have contributed to explaining variations in individual investor behavior biases.

Goodness of Fit Test Results (Q-Square/Q²)

The goodness of fit test aims to assess how well the research model is able to represent the observed data as a whole. One of the indicators used is the Q-Square value, where a value above 0 shows the model has the potential to expose the relationships between the variables being tested. The complete results of the goodness of fit test can be observed in Table 9.

Table 9. Q-Square Results

Variabel	Q-Square
PR	0

DE	0.074
HD	0.109
LK	0
MA	0.011
OS	0.066
REP	0.097

Based on the results of the goodness of fit test presented in Table 4.16, it can be concluded that this research model has sufficient predictive ability for several dependent variables. The highest Q-Square value was found in the Herding (HD) variable of 0.109, followed by Representativeness (REP) of 0.097, Disposition Effect (DE) of 0.074, and Overconfidence (OS) of 0.066. In addition, the Mental Accounting (MA) value was recorded at 0.011, which although low, still shows very limited predictive ability. Meanwhile, the variables Demographics (PR) and Financial Literacy (LK) have a Q-Square value of 0, which indicates that the model does not have predictive capabilities for these two variables. Overall, since most of the Q-Square values are above 0, it can be said that this model has decent predictive quality, albeit at a relatively weak level.

DISCUSSION

Financial literacy not only reduces biases such as disposition effect and herding, but also has a significant and positive effect on mental accounting variables. This is unique in this study, where financial literacy usually affects all aspects or biased behavior, but it is known that investors better understand the concept of financial management that is possible in the application of mental accounting. This is in line with the findings of Baker et al. (2019), but in their research it is still not researched about investors.

The Effect of Financial Literacy on the Disposition Effect

Based on the test results on the first hypothesis, it is known that financial literacy has a positive effect on the bias disposition effect, so this hypothesis is accepted. This means that the higher the level of financial literacy possessed by individual investors, the lower their tendency to exhibit disposition effect behavior, namely selling profitable stocks too quickly and holding losing stocks for too long. These findings are in line with the results of research conducted by Garg and Singh (2018) which stated that a good financial understanding can help investors avoid emotional and irrational decisions in investing.

Disposition effect is a form of behavioral bias that is widely found in investment decision-making, especially in retail investors. This bias arises because investors feel more comfortable realizing profits as soon as possible and are reluctant to accept real losses. However, when investors have adequate knowledge of risk, the time value of money, and the principle of diversification, they are better able to objectively assess the performance of their investments and not just focus on short-term returns.

This finding is also supported by Hoffman et al. (2013) who explain that financial literacy has an important role in reducing biased behaviors such as the

disposition effect, because investors who are more financially aware tend to be more rational in evaluating information and are not easily trapped by emotional impulses. Therefore, increasing financial literacy is one of the effective strategies to help investors make more optimal decisions.

This study has similarities and differences with the research of Baker et al. (2019), where the similarity is that both studies have the same results, namely financial literacy has an influence on the disposition effect, which means that financial literacy can reduce disposition effect biased behavior. However, there is a difference between this study and the research of Baker et al. (2019), namely this study emphasizes that the disposition effect biased behavior is still relatively high, especially in Yogyakarta even though there has been an increase in literacy. However, in the study of Baker et al. (2019), financial literacy was negatively related to the disposition effect and the research was conducted in India.

Thus, the results of this study provide empirical evidence that increasing financial literacy is not only beneficial in terms of knowledge and understanding, but can also significantly reduce investors' tendency to get caught up in disposition effect behavioral bias. These findings provide important implications for educational institutions and financial literacy providers to emphasize aspects of emotional control and rational decision-making in their curricula.

The Influence of Financial Literacy on Mental Accounting

The second hypothesis that financial literacy has a positive effect on mental accounting was accepted, with a t-statistic value of 2.177 and a p-value of 0.030. These findings show that individuals with high levels of financial literacy tend to have a habit of grouping expenses or investments into different mental accounts according to the purpose or source of funds.

Mental accounting is actually a cognitive bias, but in this context it can be used strategically by investors. Individuals who have high financial literacy tend to be more careful in separating asset allocation for short, medium, and long-term needs. This is in line with the opinion of Agnew (2006), who states that mental accounting is not only a weakness in thinking, but can be a tool in more structured financial management.

This study has similarities and differences with the research of Baker et al (2019), where the similarity is that both studies state that financial literacy can improve mental accounting. However, there is a difference between this study and the research of Baker et al (2019), namely this study discusses mental accounting which was previously very rarely researched in Indonesia, while in the study of Baker et al (2019), it is known that financial literacy has a positive effect on mental accounting because investors actually understand complex financial management better.

In practice, investors with better literacy levels will group their investments according to different risks, time frames, and financial goals, although this sometimes leads them to ignore the principle of portfolio optimization altogether. Therefore, although this bias is referred to as a form of cognitive deviation, under certain conditions it can reflect a more disciplined and planned form of financial planning.

The Effect of Investment Experience Level on Overconfidence

The test results showed that investment experience had a positive and significant effect on overconfidence bias, with a t-statistic of 2.731 and a p-value of 0.006. Therefore, the H7 hypothesis is accepted. These findings indicate that the longer a person's experience in investing, the greater the tendency to be overconfident in his investment judgment.

Glaser et al. (2004) explain that past successes often lead investors to believe that they are purely due to their own expertise, not from external factors such as market conditions. This trust can develop into overconfidence, especially if it is not balanced with adequate self-evaluation and risk management.

This study has similarities and differences with the research of Glaser et al. (2004) where the similarity is that both studies state that the level of investment experience has a positive effect on overconfidence, which means that a large level of investment experience can increase a person's confidence. However, there is a difference between this study and the study of Glaser et al. (2004), namely that in this study the respondents studied tended to be young but still had a high level of confidence, which is different from the Glaser study which stated that experience is a benchmark of increasing confidence.

Although experience is an important asset in the world of investment, if it is not accompanied by reflection and emotional control, then experience can actually form the illusion of superiority. Therefore, it is important for experienced investors to continue to conduct an objective evaluation of every decision taken.

The Influence of Gender on Overconfidence

The results of the H4 hypothesis test showed that gender had a significant effect on overconfidence bias, with a t-statistic of 5.518 and a p-value of 0.000. This hypothesis is accepted, and these results are consistent with various previous studies that have stated that men have higher levels of confidence than women in financial decision-making.

Men tend to have greater confidence in their ability to manage investments, so they often make more transactions than women. This phenomenon was described in a study by Barber & Odean (2001), which found that men have a higher rate of portfolio turnover due to overconfidence, which can actually be detrimental to investment returns in the long run.

This study has similarities and differences with the research of Barber and Odean (2013), where the similarity is that both studies state that men have a higher level of confidence than women. However, there is a difference between this study and the research of Barber and Odean (2013), namely that in this study male respondents tend to have high confidence compared to women who are still in the early stages of investment, while in the study Barber and Odean (2013) it is known that men who are experienced in investing have a high sense of confidence compared to those in the early stages.

Psychologically, men tend to rate themselves as more financially competent than women, although their success rates are not always better. This is the reason why men are more susceptible to overconfidence bias, which in the long run can lead to excessive risk-taking.

The Influence of Education Level on Representativeness

The test results of the H5 hypothesis showed that education had no significant influence on representativeness bias, with a t-statistic of 0.035 and a p-value of 0.972. Thus, this hypothesis is rejected, as the results show that formal education levels do not play a role in lowering investors' tendency to make excessive generalizations or judge things based solely on similarities.

Representativeness bias occurs when investors make decisions based on past experience or events without considering rational probabilities. Although higher education is often associated with better cognitive abilities, in the context of investment decision-making, these abilities are not necessarily optimally applied.

This hypothesis is different from the previous hypothesis which has similarities and differences, where in this study it is known that there is no significant influence between education and representativeness bias. These results support the findings of Coşkun et al. (2016), who stated that psychological and experiential factors have more influence on representativeness than formal education backgrounds. Therefore, to reduce this bias, data- and probability-based decision-making training is needed, not just improving formal education.

Influence of Age on Herding

The test results support hypothesis 6, with a t-statistic of 3.472 and a p-value of 0.001. That is, H6 is accepted, and the older the investor, the lower his tendency to follow the majority decision without independent analysis.

These findings are in line with the study of Tekçe et al. (2016), which showed that older investors have higher emotional control and experience in dealing with market dynamics. They tend to be more independent in making decisions and are not easily influenced by the behavior of the masses.

This study has similarities and differences with the research of Tekçe et al. (2016), where the similarity is that both studies state that investors who are older have a better and rational experience and are not impulsive. However, there is a difference between this study and the research of Tekçe et al. (2016), namely in this study it is emphasized that young respondents are more likely to be led by opinions and discussions conducted.

As we age, investors tend to rely on personal experience over the opinions of others. This creates psychological stability and increases confidence in making decisions based on data and fundamental analysis, rather than just following market trends.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of data analysis and testing of the seven hypotheses that have been proposed in this study, the following conclusions can be drawn: Financial literacy affects the bias disposition effect.

1. The test results show that this hypothesis is accepted. This means that there is a significant influence between financial literacy on the bias of the disposition effect. Investors with high financial literacy are certainly able to

resist the tendency to sell stocks that profit too quickly and hold stocks that lose money for too long.

2. Financial literacy affects mental accounting bias.

This hypothesis is accepted, showing that there is a significant and positive influence between financial literacy on mental accounting bias. Investors with a better financial understanding tend to group money or assets separately according to their goals or psychological preferences. This shows that a better understanding of finance does not necessarily reduce bias, but can actually reinforce certain biases such as mental accounting.

3. Investment experience has a positive effect on overconfidence bias in individual investors.

This hypothesis is accepted, showing that the longer a person's investment experience, the higher the tendency to feel overconfident in their decision-making abilities. This shows that experience can strengthen confidence, but it is not always accompanied by an objective evaluation of risk.

4. Male investors show a higher overconfidence bias than female investors.

This hypothesis is accepted, showing that there is a significant difference between the sexes and overconfidence bias. Male investors tend to show a higher level of confidence in making investment decisions than women. This is in line with previous studies that have shown that men are more dominant in risk-taking and overestimating their own abilities in the context of investing.

5. Investors with higher education levels showed lower representativeness bias compared to investors with low education levels.

This hypothesis is not accepted, because no significant influence was found between education level and representativeness bias. This indicates that a formal level of education does not guarantee that investors will avoid judgments based on similarities or limited experience. Representativeness bias is more influenced by intuition and quick thinking than by academic education.

6. Older investors have a lower tendency to show herding bias compared to younger investors.

This hypothesis is accepted, showing that age has a negative effect on herding bias. Older investors tend to be more rational and experienced in dealing with market fluctuations, so they are not easily carried away by the majority decision.

Research Benefits and Implications

This research makes an important contribution to the development of the literature in the field of behavioral finance, especially in the context of individual investors in Indonesia. By analyzing the influence of financial literacy and demographic characteristics such as age, gender, education, and experience on six types of behavioral bias (disposition effect, mental accounting, herding, overconfidence, and representativeness), this study can be a reference in understanding the complexity of retail investor behavior.

Practically, this study is beneficial for individual investors to be more aware that biased behavior can occur even if a person already has a high level of financial literacy. Therefore, a more in-depth evaluation of decision-making patterns is needed, not only based on knowledge, but also awareness of psychological tendencies.

In addition, the findings of this research can be used by educational institutions and capital market players to design a more comprehensive financial literacy program. Educational programs should not only emphasize cognitive or technical aspects of investing, but also integrate psychological aspects, such as emotional control, recognition of behavioral biases, and rational decision-making strategies.

In terms of regulations and policies, the results of this research can be an input for the Financial Services Authority (OJK) and the Indonesia Stock Exchange (IDX) in increasing the effectiveness of training and investor protection programs, especially by paying attention to segmentation based on investor demographic characteristics. The findings that men and experienced investors tend to have an overconfidence bias, as well as that young investors are more susceptible to herding, can be used as a basis for a more focused and targeted educational approach.

Academically, the results of this study also provide empirical evidence that financial literacy does not necessarily reduce all types of behavioral bias, and that the influence of demographic characteristics on behavioral bias is selective. This implication encourages the need for the integration of multidisciplinary approaches, particularly between economics, finance, and psychology, in explaining investor behavior.

Recommendation

Based on the findings and limitations that have been described, it is recommended that individual investors increase their self-awareness of psychological biases in decision-making, especially overconfidence biases that occur in men and experienced investors. Financial literacy education and training institutions are also expected to develop a curriculum that covers not only technical aspects of finance, but also psychological and behavioral approaches. Regulators and capital market institutions such as the OJK and IDX are also advised to develop demographic-based education programs that are able to reach the needs of investors in a more personalized and effective manner. In addition, the next researcher is advised to develop a research model by adding new variables and a longitudinal approach so that the results obtained can reflect the dynamics of investor behavior more broadly and accurately.

ADVANCED RESEARCH

Future advanced research in behavioral finance could adopt a longitudinal and cross-cultural design to capture the dynamic evolution of investor biases over time and across different market environments. Incorporating advanced analytical techniques such as machine learning or neurofinance approaches (e.g., eye-tracking, fMRI, or behavioral experiments)

would allow deeper exploration of the cognitive and emotional mechanisms underlying biases like overconfidence, herding, and mental accounting. Expanding variables beyond demographics—such as personality traits, risk tolerance, cultural dimensions, and digital trading platform usage—would provide richer insights into investor behavior. Moreover, comparing retail investors in emerging markets like Indonesia with those in developed markets could highlight structural and cultural differences, while examining the moderating role of financial technology (fintech), social trading platforms, and AI-driven investment tools could offer a forward-looking perspective on how digital transformation reshapes behavioral biases in investment decision-making.

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