

How Behavioural Biases and Demographic Factors relate to Financial Literacy

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Abstract - The research aims to analyze the effect of factors of demography and investor behaviors on financial literacy for investors and potential investors in Indonesia. The paper used questionnaires in collecting primary data. Policymakers, investors, and other shareholders should consider the results of this study in making important policies, especially regarding investor behaviors, not all investors act rationally. Regarding the research limitations, future research can use the research object not limited to behavioral biases and demographic factors, but more to discover a research model for financial literacy determinants. Future research may study investors in different countries to find the effect of investor characteristics on financial literacy.

Keywords: behavioral biases, demographic factors, financial literacy, investors

Introduction

The growth of financial literacy is obvious in the economic area. To make responsible financial decisions, investors must have financial knowledge, skills, and confidence which are depicted through financial literacy. According to a survey in 2019 which was conducted by Otoritas Jasa Keuangan (OJK), Financial Literacy Index was 38.03 %, as we can see from Figure 1. This survey was conducted with 12,773 respondents in 34 provinces taking into gender and strata of urban. This figure is an increase compared to a survey that was conducted in 2016, 29.7 %. Therefore, public financial literacy has increased by 8.33 % over the last three years.

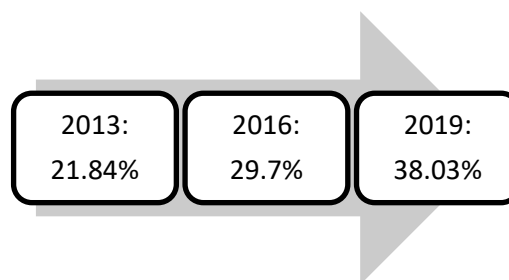


Figure 1. Financial Literacy Index

Source: ojk.go.id (processed by researchers)

This topic raises the issue of the important role of education to make better decisions in investment. Financial education nowadays starts at primary schools. Many activities from children to adults improving financial literacy have been started. Financial literacy appears in the minds of the people of the world. Since the occurrence of financial instrument complications, the role of financial literacy has grown extremely (Lusardi & Mitchell, 2007). Investors will have the best information in making decisions because of the increasing financial

literacy level. Furthermore, financial products utility that has high innovation has encouraged investors to be active in the market (Calvet et al., 2004). Due to the complexity of financial instruments, to help investors make investment decisions, Lusardi and Mitchell (2014) have discovered methods for financial literacy that have been executed all over the world.

Traditional finance is based on the concept that markets act rationally in making decisions (Baker and Filbeck, 2013). On the contrary, behavioral finance assumes that investors deviate from standard decision-making, systematically, which is different from traditional finance (Tourani-Rad & Kirkby, 2005). Investors' preferences for decision-making are not based on a rational basis as in traditional finance. Due to specific individual experiences, Cronqvist and Siegel (2014) found that investors act irrationally which has different behavior in the investment decision. Dealing with gains and losses in financial markets for investment, investors perform irrational behavior.

Previous research has discovered that an investor's demographic significantly affects financial literacy. Many studies examine the effect of financial literacy on gender, whereas, in terms of financial literacy, men are better than women (Worthington (2006); Dvorak & Hanley (2010); Kilich, Ata, & Seyrek (2015)). However, Barish's (2016) study investigating o the financial literacy level among students on campus found that university students have low financial literacy. In addition, among students, males have lower financial literacy than females. Furthermore, Garg and Singh (2018) found that the financial literacy rate in much of the world is quite low. It was also found that demographic variables significantly affect financial literacy.

To the phenomenon, data, and findings of previous research, financial literacy is really important in making investment decisions, especially for complex financial instruments. It is hard to make better investment decisions for complex financial instruments without good financial literacy. Furthermore, this study focuses on identifying financial literacy, behavioral biases, and demographic factors and determining the effect between demographic factors and behavioral biases on the financial literacy of individuals and potential investors in Indonesia.

Method

By using simple random sampling, the respondents studied were investors and potential investors in Indonesia as many as 113 respondents. Structured questionnaires were prepared and filled by investors and potential investors for data collection. These questionnaires are entered into SPSS, one of the statistical tools, by coding each answer with a numeric value. This is quantitative research with descriptive and multiple linear regression.

Multiple linear regression

Regression is a linear equation that represents the linear relationship between independent and dependent variables. Furthermore, multiple linear regression provides a linear equation that assigns more than one independent variable to one dependent variable. In this study, there are two independent variables, Demographic Factors and Behavioral Bias with Behavioral Finance, and the general linear equation related to this matter is

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2$$

Annotation:

Y = Financial Literacy

X₁ = Demographic Factors

X₂ = Behavioral Bias

α = alpha

F-test

F-test is used to test whether Demographic Factors and Behavioral Bias together have a significant effect on Financial Literacy.

t-test

t-test used to determine whether Demographic Factors and Behavioural Bias partially influence Financial Literacy.

The questionnaires consist of 3 sections. The first section is to collect demographical information. These categories are modified by Rasool and Ullah (2020). Demographical information is gender, age, educational background, area of specialization, sources of financial information, average income level, and preferred investment. Gender has a value = 1 for males and 0 for females, age has a value = 1 for those below the age of 25 and 0 for those over age 25, the educational background has a value = 1 for postgraduate and 0 for undergraduate, area of specialization has value = 1 for business-related and 0 for non-business related, average income has value = 1 for below Rp 2,000,000 and 0 for more than Rp 2,000,000, Info source of financial information has value = 1 for parents and 0 for the others and preferred investment has value = 1 for shares or bonds and 0 for the others. The parent's education has a value = 1 for postgraduate and 0 for undergraduate. Parent's income has value = 1 for below Rp 4,000,000 and 0 for more than Rp 4,000,000. Parent's occupation has value = 1 for business-related and 0 for non-business related.

Finally, the second section is to measure behavioral biases, it includes 30 statements. All of the statements are measured by using a 5-point Likert scale. This study modified behavioral biases measurements that are taken by Baker, et. al (2018). The third section is to obtain financial literacy levels from investors and potential investors. This part has 16 items on the financial knowledge scale that was modified from Van Rooij, Lusardi, and Alessi's (2011) study. This part consists of basic literacy questions and advanced literacy questions. This section uses a multiple-choice response. Each correct answer is given with a 1 score.

Results and Discussions

Table 1 summarizes the demographic profiles of 113 respondents. The samples consist of 35% males and 65% females. The age groups between below age 25 (87 percent) and over age 25 (13 percent). Respondents are well educated with 81% from graduates and 19% from postgraduates. The majority chose business (64 percent) and non-business (36 percent) for the area of specialization. Most respondents have an average income below Rp 2,000,000 (54 percent) and more than Rp 2,000,000 (46%). The Source of financial information is from the parent (61 percent) and the others (39 percent). Preferred investment: Shares or bonds (48

percent) and others (52 percent). Parent’s education: Postgraduate (37 percent) and Undergraduate (63 percent). Parent’s income: Below Rp 4.000.000 (27 percent). More than Rp 4.000.000 (73 percent). Parent’s occupation: Business (50 percent) and Non-business (50 percent).

Table 1. Demographic Profiles

Profile	Group	Frequency	Percentage
Gender	Male	40	35.3982
	Female	73	64.6018
Age	Below age 25	98	86.7257
	Over age 25	15	13.2743
Educational background	Undergraduate	92	81.4159
	Graduate	21	18.5841
Area of specialization	Business	72	63.7168
	Non-business	41	36.2832
Average income	Below Rp 2,000,000	61	53.9823
	More than Rp 2,000,000	52	46.0177
Source of financial information	Parent	69	61.0619
	The others	44	38.9381
Preferred investment	Shares or bonds	54	47.7876
	The others	59	52.2124
Parent’s education	Postgraduate	42	37.1681
	Undergraduate	71	62.8319
Parent’s income	Below Rp 4,000,000	30	26.5487
	More than Rp 4,000,000	83	73.4513
Parent’s occupation	Business	56	49.5575
	Non-business	57	50.4425

Table 2 shows the correlation among study variables. It provides initial support for the proposed hypothesis in the study.

Table 2. Correlations between Demographic Factors, Behavioral Bias and Financial Literacy

		FL	DF	BB
Pearson Correlation	FL	1.000	-.003	-.217
	DF	-.003	1.000	-.115
	BB	-.217	-.115	1.000
Sig. (1-tailed)	FL	.	.489	.010
	DF	.489	.	.113
	BB	.010	.113	.
N	FL	113	113	113
	DF	113	113	113
	BB	113	113	113

It is shown that the correlation coefficient of both independent variables and the dependent variable is negative values which indicate the negative relationship between Demographic Factor and Financial Literacy and Behavioural Bias and Financial Literacy. From Table 2, it is known significance value of Behavioral Bias is 0.010, less than 0.05, which shows Behavioral Bias and Financial Literacy are significantly related. However, since the

significance value of Demographic Factors is 0.489, bigger than 0.05, then Demographic Factors have no significant relationship with Financial Literacy.

Table 3. F-test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5706212.854	2	2853106.427	2.766	.067 ^b
	Residual	113444311.288	110	1031311.921		
	Total	119150524.142	112			

a. Dependent Variable: FL

b. Predictors: (Constant), BB, DF

Based on the statistical result, R^2 is 48%, which means Behavioral Bias and Demographic Factors affect Financial Literacy by 48%. As much as 52% is influenced by the other variables.

Table 4. R^2

Model Summary

Model	R	R Square	Adjusted R Square	Std. The error in the Estimate
1	.219 ^a	.048	.031	1015.53529

a. Predictors: (Constant), BB, DF

b. Dependent Variable: FL

From Table 6, the regression equation is obtained as follows:

$$Z = 2024.356 - 0.250 X_1 - 0.106 X_2$$

A constant of 2024.356 means that if the Demographic Factors and Behavior Bias is zero, the Financial Literacy value is 2024.356. The demographic Factors coefficient is -0.250 means that each addition of one unit on this variable (another variable does not change) will decrease the value of Financial Literacy by -0.250. Demographic Factors have no significant effect on Financial Literacy since Demographic Factors have a significance level of 0.768 which is larger than 0.05.

The Behavioral Bias coefficient is -0.106, that is each addition of one unit on Behavioral Bias (another variable does not change) will decrease the value of Financial Literacy by 0.106. Since the significance level of Behavioral Bias is 0.020, smaller than 0.05, it can be concluded that The behavioral Bias coefficient significantly affects Financial Literacy.

Table 5. t-test

Model		Unstandardized Coefficients		Standardized	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2024.356	469.626		4.311	.000		
	DF	-.250	.842	-.028	-.296	.768	.987	1.013
	BB	-.106	.045	-.220	-2.352	.020	.987	1.013

a. Dependent Variable: FL

This research examines the existence of Demographic Factors and Behavioral Biases for investors and potential investors in Indonesia. Behavioral biases act as the determinant of financial literacy, investors do not react rationally constantly. There is a negative effect on behavioral biases and financial literacy. If there's an increase in financial literacy, it will lead to a decrease in behavioral biases. Market regulators and policymakers should consider the behavioral tendencies of individual investors. The result of this study is supported by previous studies (Ates, et.al., 2016; Sayinzoga et al., 2016; Chaulagain, 2019; Rasool and Ullah, 2020; Dai and Kostini, 2021; Lebdaoui, Chetioui, and Ghechi, 2021).

Ates et al. (2016) investigated financial literacy and behavioral biases from 596 individual stock investors. They found that some investors had a low level of financial literacy and that behavioral biases significantly affect financial literacy. Furthermore, Sayinzoga et al. (2016) examined the effect of financial literacy training on financial knowledge and behavior. Training activity in this study increased financial literacy for all participants, hence, financial literacy is one of the significant factors in defining behavioral biases. Furthermore, Chaulagain (2019) studied financial literacy's contribution to the behavior of small borrowers in Nepal. In this study, a sample survey is carried out with 393 samples in Nepal. The study discovered that financial literacy contributes positively to both personal and institutional financial behavior. They discovered financial education and literacy contribute significantly to the behavior and thereby well-being of small borrowers. Proper financial education contributes financial behavior of small borrowers and thereby personal financial well-being.

Furthermore, the same research idea about financial literacy was also conducted in Pakistan. Rasool and Ullah (2020) examined the effect between two variables, financial literacy, and behavior. This research located a significant effect between the variables, that is the increasing level of financial literacy will lead to reducing behavioral biases. When it comes to demographic factors, female respondents have lower financial literacy than male respondents. Dai and Kostini (2021) studied the effect of financial attitude and financial literacy on behavioral finance by using multiple regression analyses. The result concludes that most businessmen tend to extend business finances due to the opportunity to open a new business and gain finance knowledge from training courses, education, and families. Moreover, this study infers that most business owners prefer paying cash rather than debt. They also discovered that behavioral finance is significantly affected by financial attitude and financial literacy.

Research has also been conducted in the emerging stock market, especially for Africa and Arabs. Lebdaoui, Chetioui, and Ghechi (2021) discovered that two independent variables, overconfidence, and representativeness, significantly affect financial performance, that is, a negative effect for overconfidence and a positive effect for representativeness, both associated with the same dependent variable, financial performance. Financial literacy is a crucial factor in making an investment decision. Lusardi and Mitchell (2007) stated that the importance of financial literacy has developed rapidly with the growth of financial selection. The result of the research shows that the effect of behavioral bias and financial literacy is significant which is supported by some previous studies (Baker, et. al 2018). They found the existence of behavioral biases. Financial literacy gave a negative effect on the disposition effect and herding bias and a positive effect on mental accounting bias.

However, the Demographic Factors variable has no significant effect on the Financial Literacy variable, which is different from the previous studies (Chen and Volpe, 1998; Al-Tamimi and Kalli, 2009; Lantara and Kartini, 2015; Baker, et. al., 2018). From the result, the lower knowledge was from categories non-business majors, women, students in the lower class ranks, under 30 years old, and with less work experience(Chen and Volpe, 1998). Wrong opinions and incorrect decisions come from students that have lower knowledge.

Al-Tamimi and Kalli (2009) find the roles of demographic factors in financial literacy. Income, education, and workplace activities are the demographic factors that influence financial literacy. The higher the financial literacy the respondents with higher income have the higher their educational background, and work in financial industries. The result also reveals that the financial literacy of men respondents is higher than women. Furthermore, Lantara and Kartini (2015) studying financial literacy find that high literacy comes from several categories, from gender categories it came from male students; from major backgrounds, higher literacy from those from economics and business majors; from income and work experience categories it was from those with higher incomes and more work experience. Baker, et. al., (2018) find males are more overconfident than females in the stock market knowledge. From this study, the most important demographic variables related to behavioral biases are occupation, age, and investment experience. Behavioral biases among Indian investors, mean investors do not act rationally.

Conclusions and Recommendations

This study aims to determine the effect between demographic factors and behavioral bias on the financial literacy level of 113 investors and potential investors in Indonesia. Both Demographic Factors and Behavioral Bias have a negative relationship with Financial Literacy. In general, this study has demonstrated that the important determinant of Financial Literacy is Behavioural Bias. Behavioral Bias has a significant relationship with Financial Literacy. Market regulators and policymakers should consider the behavioral tendencies of individual investors. However, this study reveals that Demographic Factor has no significant relationship with Financial Literacy. Despite the result being supported by the previous studies, this research is limited to convenience sampling that restricts the result to this class of sample only (not general to the population. This research is also limited to behavioral biases and

demographic factors variables. Future research should discover other research models for financial literacy determinants and study investors in different countries to find the relationship between investor characteristics and financial literacy.

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