



The Effect of Financial Literacy on the Ability to Detect Investment Fraud

Aida Nursanti¹; Irwan Trinugroho²

¹ Master of Management Student, Universitas Sebelas Maret, Indonesia

² Faculty of Economics and Business, Universitas Sebelas Maret, Indonesia

E-mail: aidasanti88@gmail.com; irwan.trinugroho@gmail.com

<http://dx.doi.org/10.47814/ijssrr.v6i12.1840>

Abstract

The financial sector has been increasingly digitized over the last few years, and the volume of fraudulent operations has also increased, which can have severe consequences. People's digital lives are growing along with the proliferation of the internet and other digital media, giving rise to increasingly sophisticated forms of fraud as a result of the increasing availability of various financial services, which of course will be detrimental to potential investors who want to develop their businesses due to their very minimal knowledge of finance. This study aims to examine the effect of financial literacy on the ability to detect investment fraud, with the moderating variables of gender, age, and level of education. With a sample of 400 residents living in Greater Solo, this study used simple linear regression analysis and Moderated Regression Analysis (MRA). Based on the results and discussion of the above research, financial literacy has a positive and significant effect on the ability to detect investment fraud. In addition, the factors of gender, age, and education have no significant effect on moderating the effect of financial literacy on the ability to detect investment fraud.

Keywords: *Financial Literacy; Investment Fraud; Ability to Detect Investment Fraud*

Introduction

The increasing financial digitization in the last few years also increases detrimental fraudulent possibilities (Engels et al., 2019). The Internet's development and other digital media allow people to expand their digital lives. They can also enjoy easy access to many financial services. However, the progress also triggers more complex fraudulent modes (Brenner et al., 2020). There have been many kinds of fraudulent activities with a wider scope. Therefore, it is more difficult to identify them all, causing damage to household welfare and economic interests worldwide (Kawamura et al., 2021).

These fraudulent practices have existed in Indonesia. Data from Satgas Waspada Investasi (SWI) showed that in 2019, SWI had terminated 442 illegal investment entities, 1.493 illegal peer-to-peer lending fintech companies, and 68 illegal pawning entities. These figures are the highest in the last five

years (from 2017 to July 2022). Illegal investment, or investment fraud, has had many negative and significant impacts on the public. In 2022, SWI recorded total losses of IDR 121.14 trillion due to investment fraud from 2007 to July 2022. 3.699.153 members suffered these losses. Investment scams have been attractive to potential investors. They promise high returns with lower risk or even no risk. Investors are promised passive income through a scheme to expand the network and generate income from the next investor (Mohd Padil et al., 2021).

There are also different forms of individual financial fraud, like consumer product fraud, prize and sweepstakes fraud, charity fraud, and relationship fraud, but they are not significantly increasing (Hagen & Malisa, 2022). This matter is a consequence of not knowing and understanding finances well. In the end, people will become fraud victims (Losada et al., 2022; Richardson et al., 2022). Besides, some investment frauds, such as tunneling and intentional errors in financial reporting, have led to more threats to the market (Niu et al., 2019; Kowaleski et al., 2020). On the other hand, if potential investors have experienced fraud, such victimization can push them from marginal investors to not investing at all, thereby suffering the consequences for their lifetime assets and asset accumulation (Jacoby et al., 2023; Xiao et al., 2022).

Many studies have studied the relationship between investment fraud and financial literacy. According to Cossa et al. (2022), financial literacy means the skills, motivation, and confidence to implement knowledge of financial concepts and risks to make wise financial decisions, improve the financial well-being of oneself and their community, and engage in economic activities. Individual financial skills such as managing or allocating finances effectively will result better if he has adequate financial literacy (Itebeke et al., 2020). Also, Kumar et al. (2023) explained that financial literacy is a driving factor in making proper financial decisions.

Engels et al. (2019), through their empirical analysis, found that financial literacy improves individual financial ability. This makes them more aware of the fraud possibilities. Shen et al. (2016) in Taiwan showed that people with better financial literacy prevent better financial disputes. Other findings by Venkataraman and Venkatesan (2018) concluded that individual investors often face potential risks such as investment fraud due to a lack of financial literacy. Next, Mohd Padil et al. (2021) revealed that financial literacy helps students engage in wiser decisions by distinguishing between real needs and personal desires. In his experimental research, Anderson (2016) observed that consumer financial literacy associated with understanding different financial markets significantly effects the respondents' tendency to accurately identify fraudulent advertisements.

Lee et al. (2019) studied the characteristics of investment fraud victims. They found that men have a stronger tendency to be victims of investment fraud than women. Likewise, education also positively correlates with the possibility of being a fraud victim. Those with a higher college degree are more likely to report being victims of investment scams than only high school graduates. There are two reasons for this phenomenon. First, better educational levels will make it easier for them to recognize that they have become victims of investment scams. Second, assuming that they are the ones reporting the fraud, well-educated people do not necessarily correlate with financial literacy as far as fraud is concerned.

This research also shows that age has a statistically significant effect. DeLiema et al. (2018) explained that fraud also befalls older people with good financial abilities. Older adults may be more vulnerable to fraud because they accumulate assets, and fraudsters may perceive them as easy targets because of the potential for cognitive impairment due to their aging. Based on the background explained before, this research will examine the effect of financial literacy on the ability to detect investment fraud, with some moderating variables of gender, age, and educational level.

Literature Reviews

The Effect of Financial Literacy on the Ability to Detect Investment Fraud

Financial literacy is a vital element for conducting investment activities. It functions to avoid investment fraud (Kim et al., 2021). The empirical analysis of Engels et al. (2019) showed a positive relationship between financial knowledge and the ability to detect investment fraud. Respondents who have more extensive financial knowledge can detect more fraud earlier. It is because they have become more aware and better at recognizing fraud when it occurs. Li et al. (2021) also found that financial literacy increases the ability to detect investment ability. This effect applies when the researchers exclude samples that have no financial products or digital devices. These findings conclude that better financial literacy means a better ability to detect investment fraud as early as possible (Barthel & Lei, 2021). Thus, we propose the following hypothesis:

H1: Financial literacy positively affects the ability to detect investment fraud.

The Effect of Financial Literacy on the Ability to Detect Investment Fraud, with Gender as a Moderating Variable

Scott et al. (2001) found that gender significantly effects budgeting skills. Meireika also suggests that female students have a higher awareness of their debt than males. This makes them have a lower level of debt than their male colleagues. Also, this research concluded that male students had bad shopping behavior and a reckless way of shopping, even when their debts increased.

Meanwhile, the American Association of Retired Persons (AARP) explained that highly educated men with above-average income and financial knowledge have a greater possibility of being victims of investment fraud. Other studies (Al-Ajmi, 2008; Kabra, Mishra, & Dash, 2010) found that men are less risk-resisting than women. Leiei et al. (2019) studied the characteristics of investment fraud victims. They revealed that men are more likely to report being victims of investment fraud than women. Likewise, Whitty (2020) also found that most investment fraud victims are old men. It means that male respondents can weaken the relationship between financial literacy and the ability to detect investment fraud. In this way, we have formulated the following hypothesis:

H2: Gender moderates the effect of financial literacy on the ability to detect investment fraud.

The Effect of Financial Literacy on the Ability to Detect Investment Fraud, with Age as a Moderating Variable

Another factor believed to effect an individual's ability to intuitively detect investment fraud is age. Wilkins et al. (2012) studied the relationship between the two factors. They showed that older investors have a higher level of resilience to fraudulent investments than younger ones. This finding is similar to an AARP survey showing that investors aged 50 or more dominate investment fraud victims. Ganzini et al. (1990) showed that 88% of investment fraud victims were investors aged 45 to 65. This finding is also in line with a survey by The Fed, which revealed that young investors tend to choose investments with lower risks. (Sablik, 2014). Delima et al. (2018) showed that fraud often befalls the older generation due to their poor financial abilities. Older adults may be more susceptible to fraud because of the accumulation of assets. The fraudsters also believe they are easy targets because of the potential for cognitive impairment associated with aging. Leiei et al. (2019) concluded that age is statistically significant. Specifically, those in their 50s and 60s are more likely to be fraud victims. Thus, we propose the third hypothesis as follows:

H3: Age moderates the effect of financial literacy on the ability to detect investment fraud.

The Effect of Financial Literacy on the Ability to Detect Investment Fraud, with Educational Level as a Moderating Variable

Based on attribution theory, past successful experiences can drive someone to do the same thing in the future. Well-educated people believe that past successes are the foundation for future actions regardless of the failure risks (Gui et al., 2021). Individuals with better educational backgrounds are more likely to fall for investment scams because they think they have previously made similar successful investments. This situation encourages fraudsters to conduct investment fraud. Some studies have confirmed the effect of investors' educational levels on the early detection of investment fraud. Wilkins et al, (2012) found that most investment fraud victims were well-educated people. Another survey showed that 62.1% of investment fraud victims were those studying at colleges for more than four years (Shadel and Pak, 2017). Besides, a 2014 FCA study found that the highly educated investor segment was 2.5 times more vulnerable to becoming investment fraud victims.

There is a negative relationship between education and early detection of investment fraud. It is because investors with higher educational levels consider themselves to have better investment knowledge than those with lower education (Kelly et al., 2023). In other words, more educated investors have an optimism bias. It is a tendency to believe that they have a lower probability of experiencing fraud than others (Fletcher and Pessanha). Thus, well-educated investors will make wise investment decisions if they are not affected by bias (Iqbal, 2015). Lee et, al, (2019) revealed that higher educational background does not always correlate with financial literacy as far as fraud is concerned. The AARP study stated that college-educated men have a greater possibility of being investment scam victims than those with above-average income and financial knowledge. Therefore, we propose the following fourth hypothesis:

H4: Educational level moderates the effect of financial literacy on the ability to detect investment fraud.

The following figure describes the theoretical framework of this research.

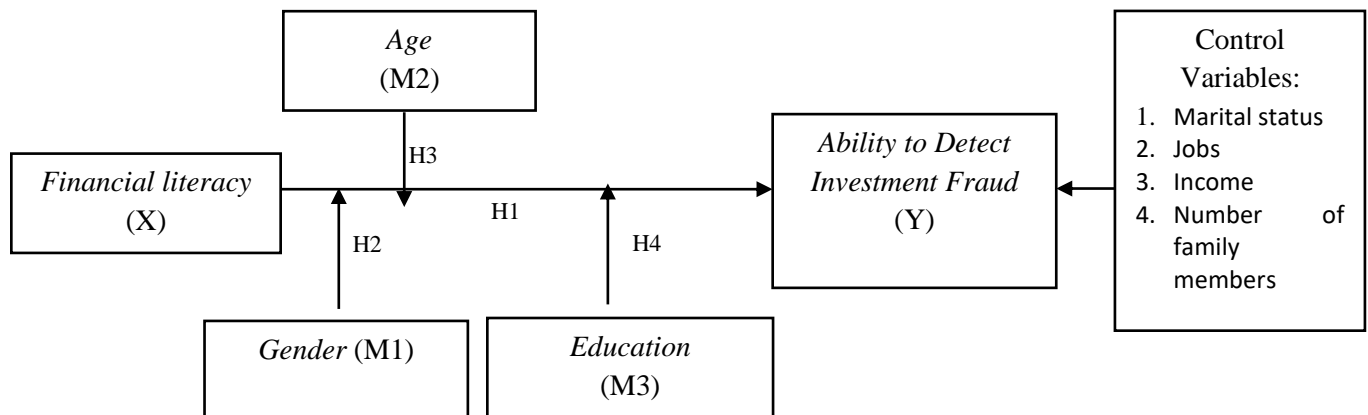


Figure 1 Theoretical Framework

Research Methodology

Research Design and Research Sources

This research is a type of quantitative research. This study only used primary data. The method of data collection using questionnaires involves submitting a series of open-ended questions to respondents. They will respond to the questionnaire by providing information about the variables studied, such as financial literacy, ability to detect investment fraud, gender, age, and education level.

Population and Sample

The population is made up of adults with an age range of 20–50 years. It is because they have been able to act in law enforcement or have been married. They also have experience in investment fraud and live in the Solo Raya, which covers six regencies and one municipality, namely Sukoharjo Regency, Karanganyar Regency, Klaten Regency, Wonogiri Regency, Sragen Regency, Boyolali Regency, and Surakarta City. In 2021, those aged 20–50 were 207,033. If the respondents fit the criteria as a data source, this research uses a convenience sampling technique. Participants who agree to provide the necessary information directly or indirectly can be included as a sample. Using the Slovin formula (Suigiyono, 2014), 400 respondents for this research live in the Solo Raya area.

Data Collection Technique

The data collection uses questionnaires. The data analysis uses a nominal and a Likert scale. The nominal scale allows the researcher to assign the subject to specific categories or groups. For example, concerning gender variables, respondents can be grouped into two categories: male and female (Sekaran and Bougie, 2016). Meanwhile, the Likert scale aims to examine how many subjective qualities agree or disagree with the statements on the five-point scale, as follows: (1) Strongly Disagree; (2) Disagree; (3) Doubtful; (4) Agree; and (5) Strongly Agree.

Data Analysis Method

This research examines the effect of financial literacy on the ability to detect investment fraud. The independent analysis method for the infinite model above will use the simple linear regression analysis test, considering that there is only one dependent variable in the research. In the simple linear regression analysis, the researcher divides the analysis process into three parts: (1) the model feasibility test (F-Test); (2) the significance test (T-Test); and (3) the determination coefficient test (R²). The simple linear regression calculation uses the computerized statistical program SPSS for Windows. The regression model equation used in this research is:

$$Y = \alpha + \beta_1 X_1 + \beta_2 VK_1 + \beta_3 VK_2 + \beta_4 VK_3 + \beta_5 VK_4 + \epsilon \dots (1)$$

Note :

Y : dependent variable (ability to detect investment fraud)

X₁ : financial literacy

VK₁ : marital status

VK₂ : job

VK₃ : Income

VK₄ : number of family members

A : Constant

β_1 - β_4 : determinant coefficient that describes the variables

ϵ : error

Moderating Variable Test

This research uses moderate regression analysis (MRA) to intuitively examine the interaction between the moderating and independent variables concerning developmental variables. The MRA analysis aims to check if this moderating variable is strong to effect the independent variables. There are also moderating variables from financial literacy analysis to investment fraud predictors, namely gender, age, and educational level. There are three testing models for the moderation variable.

Moderation regression equation in this research is:

$$Y = \alpha + \beta_1 X_1 + e \dots (2)$$

$$Y = \alpha + \beta_1 X_1 + \beta_2 Z + \beta_3 X_1 * M_1 + \beta_4 X_1 * M_2 + \beta_5 X_1 * M_3 \dots (3)$$

Note :

Y : dependent variable (ability to detect investment fraud)

X1 : financial literacy

M1 : gender

M2 : age

M3 : educational level

α : Constant

$\beta_1 - \beta_4$: determinant coefficient that describes the variables

Results and Discussions

Results

Model Fitness Test (F-test)

Table 1 Results of the F-test

ANOVA ^a						
	Model	Sum of Squares	Df	Mean Squ	F	Sig.
1	Regression	477.983	1	477.983	52.654	.000 ^b
	Residual	3612.977	398	9.078		
	Total	4090.960	399			
a. Dependent Variable: Investment Fraud						
b. Predictors: (Constant), Financial Literacy						

With a significant level (probability) = 5% (0.05), the regression results have found that F-count = 0.000. The data processing results show that the probability value of the F-count (0.000) is lower than the significance level (0.05). Therefore, Ho is rejected and Ha is accepted. It can be concluded that the financial literacy variable has a simultaneous effect on the ability to detect investment fraud.

Significance Test (t-test)

Table 2 Results of the T-test

Coefficients ^a						
	Mode	1		Standardized	t	Sig.
		Unstandardized Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	4.226	1.046		4.038	.000
	Financial literacy	.171	.024	.342	7.256	.000

a. Dependent Variable: Investment Fraud

This is the test on the financial literacy variable on the ability to identify investment fraud (Y) with a significance level (probability) = 5% (0.05). The Multiple Regression test result obtains a sig t-count value of 0.000. The data processing result generates a sig t-count value (0.000) lower than the significance level (0.05). Therefore, Ha is rejected and Ho is accepted. It can be concluded that financial literacy positively and significantly effects the ability to detect investment fraud.

Determinant Coefficient (R² test)

R² (Determinant Coefficient) is a numerical measure to identify how well the independent variables can describe the overall internal variables. The R² (Determinant Coefficient) value starts from 0 to 1. The ability of the independent factors to describe the independent variables increases with increasing R².

Table 3. Determinant Coefficient

Model Summary				
Model	R	R Squ		Std. Error of the Estimate
1	.342 ^a	.117	.115	3.01294

a. Predictors: (Constant), Financial Literacy

The regression results with the OLS method generates the R² (Determinant Coefficient) value of 0.117. It means financial literacy can explain the ability variable to identify investment fraud by 11.7%. Meanwhile, the remaining 88.3% is explained by other variables beyond this research such as finance, experience, and others.

Moderated Regression Analysis (MRA)

Table 4 Moderated Regression Analysis (MRA)

Variable	Unstandardized Coefficient	Standardized Coefficient	t	Sig.
Constant	3.290		.684	.494
Financial Literacy	.223	.445	2.080	.038
Gender	.550	.086	.251	.802
Age	-.415	-.058	-.208	.836
Education	.406	.115	.358	.721
Financial Literacy * Type of Gender	-.034	-.253	-.698	.486
Financial Literacy * Age	.011	.074	.241	.810
Financial Literacy * Education	-.009	-.125	-.344	.731

R ²	: 0,146
Adjusted R ²	: 0,127
F-statistics	: 7,421
N	: 400
Dependent Variable (Y): Investigation Fraud Ability (Y)	

The calculation results using the SPSS for Windows computer statistical program generate the Linear Moderate Regression Analysis (MRA) equation presented in Table 4. The equation is:

$$Y = 3,290 + 0,223X + 0,550Z1 - 0,415Z2 + 0,406Z3 - 0,034X*Z1 + 0,011X*Z2 + 0,009Z3$$

The equation above explains the effect of financial literacy, gender, age, and education, X*Z1 moderation, X*Z2 moderation, and X*Z3 moderation on the ability to detect investment fraud. The meaning of the regression coefficient is:

1) Constant = 3,290

The constant value is 14.529. It means that if financial literacy, gender, age, education, Moderation X*Z1, Moderation X*Z2, and Moderation X*Z3 do not change or are equal to zero, then the Investment Fraud Ability (Y) will be 3,290 points.

2) Financial literacy regression coefficient on Investment Fraud Ability = 0.223

The regression coefficient is positive, meaning that if financial literacy (X) increases by 1 point, then investment fraud intelligence (Y) will increase by 0.223 points and vice versa, with an assumption of other variables being constant.

3) The coefficient is positive, meaning that if the marital status (Z1) increases by 1 point, then the Ability to Identify Investment Fraud (Y) will decrease by 0.220 points and vice versa, with the assumption that other variables are constant.

4) Gender regression coefficient on the ability to detect investment fraud = -0.415

The coefficient is negative, meaning that if the age (Z2) decreases by 1 point, then the Ability to Identify Investment Fraud (Y) will change by 0.415 points and vice versa, with the assumption that other variables are constant.

5) Education regression coefficient on the Ability to Test Investment Fraud = 0.406

The coefficient is positive, meaning that if education (Z3) increases by 1 point, then the investment fraud intelligence ability (Y) will increase by 0.406 points and vice versa, with the assumption that the other variables are constant.

6) Moderation regression coefficient X*Z1 on the ability to detect investment fraud = -0.034

The coefficient is negative, meaning that if the X*Z1 moderation changes by 1 point, then the investment fraud detection ability (Y) will change by 0.034 points and vice versa, with the assumption that other variables are constant.

7) Moderation regression coefficient X*Z2 on the ability to detect investment fraud = 0.011

The coefficient is positive, meaning that if X*Z2 moderation increases by 1 point, then the investment fraud detection ability (Y) will increase by 0.011 points and vice versa, with the assumption that other variables are constant.

8) Moderation regression coefficient X*Z3 on the ability to detect investment fraud = -0.009

The coefficient is negative, meaning that if the $X*Z3$ moderation changes by 1 point, then the Ability to Detect Investment Fraud (Y) will change by 0.009 points and vice versa, with the assumption that other variables are constant.

The significance test (T-test) in the MRA analysis has found the following results:

- 1) Testing the effect of Financial Literacy (X) on the Variable Ability to Detect Investment Fraud (Y)

H1: Financial literacy positively affects the ability to detect investment fraud.

The significant level (probability) value is 5% (0.05). The results of the Multiple Regression show a probability t-count of 0.038. Based on the data processing result, the probability value (0.038) is lower than the Significance level (0.05). Therefore, H_0 is rejected and H_a is accepted. It can be concluded that Financial Literacy (X) positively and significantly affects the ability to detect investment fraud (Y), so H1 is **accepted**.

- 2) Effect of Gender (Z1) which moderates the effect of Financial Literacy (X) on the Ability to Detect Investment Fraud (Y).

H2: Gender moderates the effect of financial literacy on the ability to detect investment fraud.

The significant level (probability) value is 5% (0.05), and the result of the Moderate Regression Analysis (MRA) shows a probability t-count of 0.486. The data processing shows that the probability value of the t-count (0.486) is lower than the significance level (0.05). It means H_0 is rejected or H_a is accepted. It can be concluded that the Moderation variable $X*Z1$ has no significant effect on the ability to detect investment fraud (Y). It also means that gender does not moderate the effect of financial literacy on the ability to detect investment fraud (Y) so H2 is **rejected**.

- 3) Effect of Financial Literacy (Z2) which moderates the effect of Financial Literacy (X) on the Ability to Detect Investment Fraud (Y)

H3: Age moderates the effect of financial literacy on the ability to detect investment fraud.

The significant level (probability) value is 5% (0.05) and the result of the Moderate Regression Analysis (MRA) shows a probability t-count of 0.810. The data processing shows that the probability value of the t-count (0.810) is lower than the significance level (0.05). It means H_0 is rejected or H_a is accepted. It can be concluded that the moderation variable $X*Z2$ has no significant effect on the ability to detect investment fraud (Y). It means that age does not moderate the effect of financial literacy on the ability to detect investment fraud (Y) so H3 is **rejected**.

- 4) Effect of Education (Z3) which moderates the effect of Financial Literacy (X) on the Ability to Detect Investment Fraud (Y)

H4: Education can moderate the effect of financial literacy on the ability to detect investment fraud

The significant level (probability) value is 5% (0.05), and the result of the Moderate Regression Analysis (MRA) shows a probability t-count of 0,713. The data processing shows that the probability value of the t-count (0,713) is lower than the significance level (0.05). It means H_0 is rejected or H_a is accepted. It can be concluded that the moderation variable $X*Z1$ has no significant effect on the ability to detect investment fraud (Y). It also means that education does not moderate the effect of financial literacy on the ability to detect investment fraud (Y), so H4 is **rejected**.

R² (Determinant Coefficient) Test

R² (Determinant Coefficient) is a numerical measure of how well the independent variables can describe the overall internal variables. The R² (Determinant Coefficient) value starts from 0 to 1. The ability of the independent factors to describe the independent ones increases with increasing R². The Moderate Regression Analysis (MRA) generates the R² (Determination Coefficient) value of 0.140. It means that the ability to identify investment fraud can be explained by financial literacy, gender, age, education, moderation X*Z1, moderation X*Z2, and moderation X*Z3 simultaneously by 14.0%. Meanwhile, the remaining 86.0% is explained by other variables beyond the model like experience and others.

Discussions

The Effect of Financial Literacy on the Ability to Detect Investment Fraud

The Linear Regression analysis shows that financial literacy positively and significantly affects the ability to detect investment fraud (t-count probability value (0.038) < Significance Level (0.05)). This describes how the improvement of people's financial literacy supports their ability to detect investment fraud. Financial literacy is a vital element of investment activities. People can avoid investment fraud, and it is a form of knowledge about financial terms, concepts, and construction (Gignac et al., 2023; Gignac, 2023). Financial literacy can also function as investor protection (Sun et al., 2020). Lokanan (2014) found that the most vulnerable to investment fraud are those with limited investment knowledge. According to Alshater et al. (2022), fraud attempts against investors who already know about investment scams in the past have little chance of success. This argument is consistent with Shiller's (1984) related to the investment decision-making of unprofessional investors. When investing, this type of investor has no objective evidence of the investment's legality. An unprofessional investor can easily trust others' advice, which promises high returns (Burke et al., 2022; Liu & Lu, 2023).

The research findings support Engels et al. (2019), who explained a positive relationship between financial knowledge and the ability to detect investment fraud. Respondents who have more extensive financial knowledge can detect more fraud because they are more aware and better at recognizing it before it happens. Wei Li et al. (2021) also showed that financial literacy increases the ability to detect investment capabilities. On the other hand, investors who receive financial literacy are more likely to increase their profits in the stock market because they already have good investment habits and are more risk-tolerant (Zhang, 2023). Financial literacy awareness will be stronger to ensure making investments and generating positive effects throughout the life cycle (Jappelli & Padula, 2013; Cupak et al., 2022).

The Effect of Financial Literacy on the Ability to Detect Investment Fraud, with Gender as a Moderating Variable

The Linear Regression analysis shows that the t-count probability value (0.486) is higher than the Significance Level (0.05). Therefore, H₀ is rejected, or H_a is accepted. It means that the moderation variable X*Z1 has no significant effect on the ability to detect investment fraud. It also shows that gender does not moderate the effect of financial literacy on the ability to detect investment fraud. The increase or decrease in the gap in people's ability to detect investment fraud depends on the extent to which they are more concerned with their insights into different investment fraud modes.

Lee et al. (2019) showed that men have a greater possibility of being investment fraud victims than women. Likewise, Whitty (2020) found that most investment fraud victims are older males. This suggests that male respondents can weaken the relationship between financial literacy and the ability to detect investment fraud (Sekita et al., 2022). However, in this research, 400 respondents show that gender does not moderate the effect of financial literacy on investment fraud. It is because the target of

investment fraud leads randomly to uncertain targets. Also, women seek more financial knowledge and generally avoid taking risks when building financial and investment skills (Struckell et al., 2022).

The Effect of Financial Literacy on the Ability to Detect Investment Fraud, with Age as a Moderating Variable

The Linear Regression analysis shows that the t-count probability value (0.810) is higher than the Significance Level (0.05). Therefore, H_0 is rejected, or H_a is accepted. It means that the moderation variable $X*Z_2$ has no significant effect on the ability to detect investment fraud. It also shows that age does not moderate the effect of financial literacy on the ability to detect investment fraud.

Wilkins et al. (2012) found that older investors have a higher level of vulnerability to investment fraud than younger ones. This finding supports the AARP survey, which shows that most of the fraud victims are investors over 50. Also, Ganzini et al. (1990) studied 77 investment fraud victims in Oregon. They found that 88% of investment fraud victims were investors aged 45 to 65. It is in line with a survey conducted by the Fed, which revealed that young investors tend to choose low-risk investments (Sablik, 2014).

DeLiema et al. (2018) stated that old people must ignore the possibility of investment fraud due to poor financial ability. They may be more vulnerable to fraud because of their asset accumulation. The fraudsters may perceive them as easy targets due to the potential for cognitive impairment associated with aging. Besides, according to Razen et al. (2021) and Nitoi et al. (2022), there is a lack of financial literacy across age groups. It has been a common phenomenon in industrialized and developing countries. Lee et al. (2019) revealed that age has a statistically significant effect. In particular, those in their 50s and 60s are more likely to report being fraud victims. This theory is the same as this research finding that age does not moderate the relationship between financial literacy and investment fraud. It is possible because the research sample is younger.

The Effect of Financial Literacy on the Ability to Detect Investment Fraud, with Education Level as a Moderating Variable

The Linear Regression analysis shows that the t-count probability value (0.731) is higher than the Significance Level (0.05). Therefore, H_0 is rejected, or H_a is accepted. It means that the moderation variable $X*Z_3$ has no significant effect on the ability to detect investment fraud. This also shows that education does not moderate the effect of financial literacy on the ability to detect investment fraud.

This negative relationship exists because investors with higher education consider themselves to have better investment knowledge than those with lower education levels (Graham, 2003). In other words, well-educated investors have an optimistic bias. It is a tendency for individuals to believe that they have a lower probability than others of becoming victims of harmful events (Fletcher and Pessanha). Thus, highly educated investors will make good investment decisions if there is no bias affecting them (Iqbal, 2015). Lee et al. (2019) revealed that higher educational levels do not always correlate with financial literacy as far as fraud is concerned. Likewise, the AARP research found that those most likely to fall victim to investment scams are college-educated men with above-average income and financial knowledge.

Conclusions and Suggestions

The results and discussions of this research conclude that financial literacy positively and significantly affects the ability to identify investment fraud. It means that better financial literacy will lead to a better ability to detect investment fraud. The gender variable does not moderate the effect of financial literacy on the ability to detect investment fraud. It shows that age does not moderate the effect of

financial literacy on the ability to detect investment fraud. The educational level also does not moderate the effect of financial literacy on the ability to detect investment fraud.

Therefore, the conclusions above suggest the next researchers conduct direct interviews and provide direct assistance in carrying out the questions to prevent the occurrence of missing information on the completion of the prepared questionnaire. Further research should also focus on variations of the independent variable or objective variables like intention in specific investment (trading) or the Islamic investment model.

References

- Al-Ajmi, Jamin, (2008), The Usefulness of Corporate Governance and Financial Ratios to Credit and Financial Analysts: Evidence from Bahrain, *European Journal of Economics, Finance, and Administrative Science*, ISSN 1450-2275 Issue 11.
- Alshater, M.M, Saba, I, Suptiani, I., Rabbani, M.R. (2022). Fintech in Islamic finance literature: A review. *Heliyon*. 8(9), e10385. <https://doi.org/10.1016/j.heliyon.2022.e10385>.
- Anderson, K. B. (2016). Mass-market consumer fraud: Who is most susceptible to becoming a victim? (FTC Bureau of Economics No. 332). Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2841286.
- Barthel, A.-C., & Lei, S. (2021). Investment in financial literacy and financial advice-seeking: Substitutes or complements? *The Quarterly Review of Economics and Finance*, 81, 385–396.
- Brenner, L., Meyll, T., Stolper, O., & Walter, A. (2019). Consumer fraud victimization and financial well-being. *Journal of Economic Psychology*.76, 102243. <https://doi.org/10.1016/j.joep.2019.102243>.
- Burke,J., Kieffer, c., Mottola, G, Perez-Arce, F. (2022). Can educational interventions reduce susceptibility to financial fraud? *Journal of Economic Behavior and Organization*. 198, 250-266. <https://doi.org/10.1016/j.jebo.2022.03.028>.
- Cossa, A., Madaleno, M.,Mota, J.(2022). Financial literacy environment scan in Mozambique. 27(4), 229-244. <https://doi.org/10.1016/j.apmr.2021.09.004>.
- Cupak,A., Fessler, P., Hsu, J.W., Paradowski, P.R. (2022). Investor confidence and high financial literacy jointly shape investments in risky assets. *Economic Modelling*. 116, 106033. <https://doi.org/10.1016/j.econmod.2022.106033>.
- DeLiema, M., Deevy, M., Lusardi, A., & Mitchell, O. S. (2018). Financial fraud among older Americans: Evidence and implications (NBER Working Paper No. 24803). Retrieved from <https://www.nber.org/papers/w24803>.
- Engels, C., Philip, D., Kumar, K.,2019. Financial Literacy and Fraud Detection. *SSRN Electronic Journal* · January 2019. <https://www.researchgate.net/publication/330421438>.
- Ganzini, L., Mcfarland, B. dan Bloom, J., 1990, ‘Victims of Fraud: Comparing Victims of White Collar and Violent Crime’, Vol. 18, No. 1, 55 – 63.
- Gignac, G. E. (2022). The association between objective and subjective financial literacy: Failure to observe the Dunning-Kruger effect. *Personality and Individual Differences*, 184, 111224. <https://doi.org/10.1016/j.paid.2021.111224>.

- Gignac, G.E., Gerrans, P., Andersen, C.B. (2023). Financial literacy mediates the effect between verbal intelligence and financial anxiety. *Personality and Individual Differences*. 203,112025. <https://doi.org/10.1016/j.paid.2022.112025>.
- Gui, Z., Huang, Y., & Zhao, X. (2021). Whom to educate? Financial literacy and investor awareness. *China Economic Review*, 67, 101608. <https://doi.org/10.1016/j.chieco.2021.101608>.
- Hagen, J., Malisa, A. (2022). Financial fraud and individual investment behavior. *Journal of Economic Behavior & Organization*. 203, 593-626. <https://doi.org/10.1016/j.jebo.2022.09.015>.
- Iqbal, N., (2015), Impact of Optimism Bias on Investment Decision: Evidence from Islamabad Stock Exchange, *Pakistan*, Vol. 6, No. 19, 74–79.
- Iterbeke, K., De Witte, K., Declercq, K., & Schelfhout, W. (2020). The effect of ability matching and differentiated instruction in financial literacy education. Evidence from two randomized control trials. *Economics of Education Review*, 78, 101949. <https://doi.org/10.1016/j.irfa.2023.102510>.
- Jacoby, G., Liao, C., Lu, X., Wan, F. (2023). The effect of fraud experience on investment behavior. *Emerging Markets Review*. 55, 101007. <https://doi.org/10.1016/j.ememar.2023.101007>.
- Jappelli, T., & Padula, M. (2013). Investment in financial literacy and saving decisions. *Journal of Banking & Finance*, 37(8), 2779–2792. doi:10.1016/j.jbankfin.2013.03.019.
- Kabra, G., Mishra, P. K., & Dash, M. K. (2010). Factors Influencing Investment Decision of Generations in India: An Econometric Study. *Asian Journal of Management Research*, 1(1), 308–326.
- Kawamura, T., Mori, T., Motonishi, T., & Ogawa, K. (2021). Is Financial Literacy Dangerous? Financial Literacy, Behavioral Factors, and Financial Choices of Households. *Journal of the Japanese and International Economies*, 60, 101131. <https://doi.org/10.1016/j.jjie.2021.101131>.
- Kelley, N.J., Wallace, A.L.H., Warner, K.L., Hanoch, Y. (2023). Analytical. *Computers in Human Behavior*. 142, 107648. <https://doi.org/10.1016/j.chb.2022.107648>.
- Kim, H.H., Maurer, R., Mitchell, O.S. (2021). Financial literacy shapes the demand for financial advice at older ages. *The Journal of the Economics of Ageing*. 20. 100329. <https://doi.org/10.1016/j.jeoa.2021.100329>.
- Kowaleski, Z. T., Sutherland, A. G., & Vetter, F. W. (2020). Can Ethics be Taught? Evidence from Securities Exams and Investment Adviser Misconduct. *Journal of Financial Economics*. 138 (1), 159-175. <https://doi.org/10.1016/j.jfineco.2020.04.008>.
- Kumar, P., Pillai, R., Kumar, N., Tabash, M.I. (2022). The interplay of skills, digital financial literacy, capability, and autonomy in financial decision-making and well-being. *Borsa Istanbul Review*. 23(1), 169-183. <https://doi.org/10.1016/j.bir.2022.09.012>.
- Liu, B., Lu, B. (2023). Can financial literacy be a substitute for financial advisers? Evidence from China. *Pacific Basin Finance Journal*. 79, 102046. <https://doi.org/10.1016/j.pacfin.2023.102046>.
- Lokanan, M.E., & Liu, Susan (2021). “The Demographic Profile of Victims of Investment Fraud: an Update”, *Journal of Financial Crime* Vol. 28 No. 3, 2021 pp. 647-658. Emerald Publishing Limited 1359-0790.

- Losada, R.G., Navarro, A.M., Sanches, J.L.R, Torres, T.G. (2022), Retirement planning and financial literacy, at the crossroads. A bibliometric analysis. *Finance Research Letters*. 44, 102109. <https://doi.org/10.1016/j.frl.2021.102109>.
- Mohd Padil, H., Suzana Kasim, E., Muda, S., Ismail, N., Md Zin, N. (2021). *Journal of Financial Crime*. Emerald Publishing Limited 1359-0790.
- Nitoi, M., Clichici, D., Zeldea, C., Pochea, M., Ciocirlan, C. (2022). Financial well-being and financial literacy in Romania: A survey dataset. *Data in Brief*. 43, 108413. <https://doi.org/10.1016/j.dib.2022.108413>.
- Niu, G., Yu, L., Fan, G., & Zhang, D. (2019). Corporate fraud, risk avoidance, and housing Investment in China. *Emerging Markets Review*. <https://doi.org/10.1016/j.ememar.2019.03.003>.
- Razen, M., Huber, J., Hueber, L., Kirchlner, M., Stefan, M. (2021). Financial literacy, economic preferences, and adolescents' field behavior. *Finance Research Letters*. 40, 101728. <https://doi.org/10.1016/j.frl.2020.101728>.
- Richardson, G., Obaydin, I., Liu, C. (2022). The effect of accounting fraud on future stock price crash risk. *Economic Modelling*. 117, 106072. <https://doi.org/10.1016/j.econmod.2022.106072>.
- Sablik, T., 2014, Investing Over the Life Cycle: One Size Doesn't Fit All, *Richmond Fed Economic Brief*, October, 1–5.
- Scott, A.J., Lewis, A. and Lea, S.E. (2001), *Student Debt: The Causes and Consequences of Undergraduate Borrowing*, The Policy Press.
- Sekaran & Bougie, (2016). *Research Methods for Business: A Skill Building Approach Seventh Edition*. United States of America: Wiley.
- Sekita, S., Kakkar, V., Ogaki, M. (2022). Wealth, Financial Literacy and Behavioral Biases in Japan: the Effects of Various Types of Financial Literacy. *Journal of the Japanese and International Economies*. 64, 101190. <https://doi.org/10.1016/j.jjie.2021.101190>.
- Shadel, D. and Pak, K., (2017), *AARP Investment Fraud Vulnerability Study*. Washington, DC: AARP's Fraud Watch Network.
- Shen, C., Lin, S., Tang, D., & Hsiao, Y. (2016). Pacific-Basin Finance Journal The relationship between financial disputes and financial literacy. *Pacific-Basin Finance Journal*, 36(November 2009), 46–65. <https://doi.org/10.1016/j.pacfin.2015.11.002>.
- Shiller, Robert. (1984). Symposium: Financial Market Efficiency. *Journal of Economic Perspectives*.
- Struckell, E.M., Patel, P.C., Ojha, D., Oghazi, P. (2022). Financial literacy and self-employment – The moderating effect of gender and race. *Journal of Business Research*. 139, <https://doi.org/10.1016/j.jbusres.2021.10.003>.
- Sugiyono. (2014). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Sun, H., Yuen, D. C. Y., Zhang, J., & Zhang, X. (2019). Is Knowledge Powerful? Evidence from Financial Education and Earnings Quality. *Research in International Business and Finance*. 52, 101179. <https://doi.org/10.1016/j.ribaf.2019.101179>.

- Venkataraman, R. & Venkatesan, T. (2018). Analysis of Factors Determining Financial Literacy using Structural Equation Modelling# R. Paper presented in the 6th International Conference on Emerging Trends in Finance, Accounting, and Banking, SDMIMD, August 2017.
- Wei, L., Peng, M., Wu, W. (2021). Financial literacy and fraud detection—Evidence from China. *International Review of Economics & Finance*. 76, 478-494. <https://doi.org/10.1016/j.iref.2021.06.017>.
- Whitty, M.T. (2020), “Is there a scam for everyone? Psychologically profiling cyber scam victims”, *European Journal on Criminal Policy and Research*, Vol. 26 No. 3, pp. 399-409.
- Wilkins, A. M., Acuff, W. W. and Hermanson, D. R., (2012), Understanding a Ponzi Scheme: Victims’ Perspectives, *Journal of Forensic & Investigative Accounting*.
- Xiao, X., Li, X., Zhou, Y. (2022). Financial literacy overconfidence and investment fraud victimization. *Economics Letters*. 212, 110308. <https://doi.org/10.1016/j.econlet.2022.110308>.
- Zhang, Y., Lu, X., Xiao, J.J. (2023). Does financial education help to improve the return on stock investment? Evidence from China. *Pacific Basin Finance Journal*. 78, 101940. <https://doi.org/10.1016/j.pacfin.2023.101940>.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).