Frontiers in Business, Economics and Management
ISSN: 2766-824X | Vol. 18, No. 3, 2025

Research on the Inhibitory Effect of Financial Literacy on Preventing Victims of Fraud

Yilin Tian *, Xiyang Chen

School of Economics and Management, Sichuan Normal University Chengdu 610101, China
* **Corresponding author**: 1703045582@qq.com

Abstract: The current situation of preventing financial fraud in China is severe. This article aims to analyze the current situation of preventing financial fraud in China, the shortcomings of public financial literacy, and strategies for improving financial literacy. Research has shown that there is a certain "U-shaped relationship" between financial literacy and fraud victims, where both high and low levels of financial literacy may increase an individual's risk of financial fraud, while moderate levels of financial literacy can help reduce this risk.

Keywords: Financial literacy, Financial fraud, Victims of fraud, Inhibitory effect.

1. Introduction

With the rapid development of the financial market, and the popularization of Internet financial methods such as financial APP and online payment, financial consumers have better consumption experience, more convenient financial service channels, more product choices, more inclusive service models and products, and have also strengthened their huge dependence on new technologies such as the Internet, bringing new crime methods to criminals.

As far as China is concerned, by 2023, the national procuratorial organs will prosecute a total of about 27000 people for financial fraud and crimes that disrupt financial management order, including 18000 people for fundraising fraud and illegal absorption and gathering of public deposits. In addition, China's procuratorial organs have prosecuted a total of 346 people for securities crimes such as fraudulent issuance, insider trading, and market manipulation, as well as 2971 people for money laundering crimes, an increase of about 14.94% compared to previous years. At the same time, China's public security organs have cracked down on about 437000 cases of telecommunications fraud and urgently intercepted approximately 328.8 billion yuan in related funds. From here, with the development of Internet technology, the fraud of financial fraud is becoming more and more serious, which makes the participants suffer more and more losses.

Faced with complex and diverse forms of financial fraud, the importance of improving residents' financial literacy for financial anti-fraud is increasingly prominent. Financial literacy can significantly reduce the occurrence of financial fraud by influencing individual decision-making behavior. However, currently, the financial literacy of Chinese residents varies greatly, and different groups of people with different literacy levels may have different strategies when facing financial fraud. Although the country has started to widely promote anti-fraud knowledge in recent years to improve residents' financial literacy and prevent financial fraud incidents. However, the improvement of financial literacy does not necessarily mean absolute avoidance of financial fraud. On the contrary, some people with high financial literacy are also likely to fall into the trap of financial fraud.

This paper aims to analyze whether there is a "U-shaped relationship" between financial literacy and fraud victims in the context of the rapid development of Internet finance, that is, people with low financial literacy and high financial literacy are more likely to be defrauded by financial fraud, while people with moderate financial literacy are the least likely to be defrauded by financial fraud. The overall trend shows a "U-shaped" distribution in form.

2. Theoretical Analysis and Research Hypotheses

The impact of residents' financial literacy on financial fraud is very high, and one of the key factors determining the quality of an individual's financial situation is the level of financial literacy. Financial literacy encompasses multiple aspects such as financial knowledge, technology, awareness, attitude, and behavior. Through the research of domestic and foreign scholars, it has been found that there are many factors that affect whether residents are victims of financial fraud, including their age, occupation, income, education level, and regional development level. However, improving the financial literacy of individual residents is considered an effective method to prevent financial fraud, and many scholars believe that the lack of financial literacy is one of the important factors in being victims of financial fraud.

However, a new theory suggests that individuals with excessive financial knowledge are more susceptible to financial fraud. Overconfidence in financial literacy can lead to changes in corresponding values and ultimately affect people's susceptibility to financial fraud. At the same time, overconfidence in financial literacy may lead some individual residents to increase their allocation ratio and investment amount of financial risk assets. These investors have a lower degree of diversification in their investment portfolios and have a deep belief in their financial literacy, thus bearing excessive risks required to achieve expected returns and increasing the likelihood of financial fraud. More importantly, for those who are overconfident in their financial literacy, their confidence in their own financial decisions and investment behavior instinctively reduces potential financial risks, further increasing the likelihood of financial fraud and increasing the losses from fraud.

For people with low financial literacy, the risk of financial fraud is self-evident. Here, this article focuses on analyzing

young people who have just entered society and do not have much financial literacy and experience, as well as elderly people living in urban and rural areas with weak financial literacy awareness. From an internal perspective, many elderly people can still maintain certain functions in most cognitive domains in their later years, but the decline in various response abilities caused by aging may affect financial decision-making, leading to a physical and natural decrease in financial literacy. From an external perspective, Peng Yuwei stated that financial fraud also has social factors. For example, elderly people believe in mostly feudal superstitions, trust others easily, blindly trust others' advice and encouragement, and are anxious about their own physical health and wealth situation. Therefore, they love to seek small benefits. Faced with the deliberate benefits given by fraudsters and the extensive promotion and disguise of financial traps, the elderly become blinded and act blindly, which also makes them more susceptible to being deceived.

For many young people who lack financial literacy, especially contemporary college students, excessive consumption behavior is not uncommon, which is also a direct factor leading them into the "interest rate trap" set by criminals. Fraudsters lure them to borrow money from illegal online lending platforms, resulting in huge compensation that they cannot repay; This is one of the important factors that push many college students towards depression and even suicide. However, whether easily misled by fraudsters, or lacking the use of Internet financial tools, or falling into the "interest rate trap", the fundamental reason is still that they are unable to accurately judge financial fraud due to their lack of good financial literacy foundation.

Compared to these two, it is temporarily speculated that the middle-income group with a certain level of financial literacy has become the group with the least possibility of financial fraud. They have no possibility of being subjected to a large amount of financial fraud due to a lack of financial knowledge; There is also no overconfidence in one's own financial literacy, and bold investments and blind actions ultimately result in serious property damage or even bankruptcy.

In summary, this article proposes research hypothesis H1: There is a significant "U" - shaped correlation between financial literacy from low to high and the likelihood of individual financial fraud and fraud losses among residents.

3. Research Design

3.1. Model Building

Firstly, this article takes the likelihood of fraud among resident i (Fraudi) as the dependent variable and the financial literacy level of resident i (FLi) as the explanatory variable. Given the collinearity of the independent variables and the complex nonlinear data relationship, a dual screening LassoLogit regression model is chosen to be constructed. As shown in equation (1):

$$In(P(Fraud=1|FL, FL2, Controls)/(1-P(Fraud=1|FL, FL2, Controls))= \beta_0+\beta_1 FL+\beta_2 FL2+\beta_3 Controls \quad (1)$$

Due to the data obtained by Frard through binary classification questions such as "whether or not you have suffered financial fraud", Frard takes a value of 0 or 1, where 0 represents no financial fraud and 1 represents financial fraud. FL and FL2 are the core explanatory variables, aiming to explore their relationship with the likelihood of residents being defrauded. Simultaneously establishing a squared term is to capture the potential non-linear relationship between financial literacy and the likelihood of fraud, in order to test the "U-shaped" relationship mentioned in the research hypothesis. Controls mentioned a series of control variables. In the study, besides financial literacy, there are other factors that may affect the likelihood of residents being defrauded. Therefore, age, gender, education level, income level, etc. were selected as control variables, β_0, is a constant term, β_1, β_2 and β_3 are coefficient of the control variable used to measure the degree to which each control variable affects the likelihood of residents being defrauded.

3.2. Variable Selection

The dependent variable: the likelihood of fraud among resident i (Fraud) and the explanatory variable: the level of financial literacy of resident i (FL), were both based on the data from the 2019 China Household Finance Survey (CHFS) conducted by Southwest University of Finance and Economics. After matching and summarizing all data according to individual and household numbers, a total of 34643 valid samples were obtained. Stata18 software was used for data analysis and empirical research.

Given that there is currently no unified standard for measuring financial literacy, and financial literacy is reflected in multiple aspects, this article constructs a financial literacy indicator system based on the results of the 2019 Southwest University of Finance and Economics China Household Finance Survey (CHFS) questionnaire, which includes 34644 observations and covers 29 regions across the country. The explanation for assigning values to financial literacy is shown in Table 1. The control variable indicators are shown in Table 1 and Table 2.

Table 1. Control Variable Index System

Primary indicators	Secondary indicators	CHFS questionnaire questions and assignment instructions	Assignment instructions in this article
		Calculation of principal and interest	Assign 3 for correct answer, assign 1 for wrong answer, assign 0 for unable to calculate
	Financial knowledge	Calculation of inflation	Assign 4 for correct answer, assign 1 for wrong answer, assign 0 for not able to calculate
Financial literacy		Judgment of the risk level of stocks and bonds	Correct answer will be assigned 4 points, wrong answer will be assigned 1 point, and no answer will be assigned 0 points
	financial behavior,	The attention paid to economic and financial information. ① Very concerned ② Very concerned ③ General ④ Rarely concerned ⑤ Never concerned	Select ① to assign 8, select ② to assign 6, and so on to select ⑤ to assign0
	financial attitude	The choice of investment risk appetite. ① High-risk high-return projects ② Slightly high-risk slightly high-return projects ③ Average risk average return projects ④ Slightly low-risk slightly low-return projects ⑤ Unwilling to take any risks ⑥ Don't know or understand	Select ① to assign 10, select ② to assign 8, and so on to select ⑥ to assign 0

Table 2. Control Variable Index System2

Primary indicators	Secondary indicators	Assignment instructions in this article
	Educational Level	Assign 0 for those who have never attended school, 1.5 for those with an education level below junior college, and 3 for those with junior college or higher education.
	Political Status	2 for Party members and 0 for non-Party members.
Head of Household's Personal Information	Registered residence	Assign 2.5 for urban household registration and 0.5 for rural household registration.
	Marital Status	Assign 2 for married and 0.5 for unmarried.
	Employment Status	Assign 1.5 for employed and 0 for others.

Table 3. Results of Double - selection Lasso Logit Model

Double-selection logit model			**Number of obs**	=	**34,643**	
			Number of controls	=	2	
			Number of selected controls	=	2	
			Wald chi2(1)	=	147.67	
			Prob > chi2	=	0.0000	
		Robust				
Fraud	Odds ratio	Std. err.	z	P>|Z|	[95%conf. Interval]	
FL2	1.004058	.0003346	12.15	0.000	1.003402	1.004714
Controls	1	(offset)				

To ensure the accuracy of the empirical process, this paper adopts mathematical research methods. Each indicator in financial literacy is compiled into a comprehensive control variable index using the summation method and is incorporated into the construction of the model. Finally, the data is input into Stata 18. Since the explained variable (Fuard) is a binary dependent variable, and considering multiple factors such as the large sample size and strong collinearity among independent variables, the Double-selection Lasso Logit model is used to construct the model. The results are shown in Table 3.

By comparing various data, it is found that for FL2, the squared term of financial literacy, the Odds ratio = 1.004058, which is positive, indicating that as the square of FL increases, the odds of Fraud occurrence will increase. z = 12.15, P>|z| = 0.000, indicating that the coefficient of FL2 is significantly non - zero, that is, the squared term of FL has a significant positive impact on Fraud. The 95% confidence interval further confirms the significance and positive impact of the FL2 coefficient. For FL, the Odds ratio = 0.8618567, which is less than 1. This means that when other conditions remain unchanged, for everyone - unit increase in FL, the odds of Fraud occurrence will become 0.8618567 times the original, that is, the odds of Fraud occurrence will decrease, indicating that FL has a negative impact on Fraud. z = - 18.09, P>|z| = 0.000, indicating that the coefficient of FL is significantly non - zero, that is, the negative impact of FL on Fraud is significant. The 95% confidence interval once again confirms the significance and negative impact of the FL coefficient. Combining the negative coefficient of FL and the positive coefficient of FL2, this initially suggests a possible U - shaped relationship. That is, when FL is relatively small, as FL increases, the odds of Fraud occurrence will first decrease due to the negative effect of FL; when FL increases to a certain extent, due to the positive effect of FL2 gradually dominating, the odds of Fraud occurrence will start to increase. This directly reflects that the "U - shaped relationship" between financial literacy and the risk of being defrauded basically exists, and proves that the research of this paper has certain practical significance.

4. Empirical Analysis

4.1. Benchmark Regression Results

This paper uses the F - test to conduct a joint significance test on FL and FL2 (test FL FL2). The chi - square statistic is

the same as the previous Wald chi2(2) value, and Prob＞chi2, indicating that the test effect is significant, further verifying the influence of independent variables in the model on the overall model. The specific test results are shown in Table 4.

Table 4. Benchmark Regression Results of F - test

test FL FL2	
(1) [Fraud]FL = 0	
(2) [Fraud]FL2 = 0	
	chi2(2) = 544.58
	Prob > chi2 = 0.0000

4.2. Robustness Test

In dealing with endogeneity problems and reducing uncertainties, due to the nature of the model itself, the Bootstrap statistical test method is selected. By repeatedly sampling the original data with replacement, the confidence interval and standard error of the statistic are estimated again. The results show that the model is still significant, the coefficients of the main independent variables (FL2 and FL) are still significant, and the directions are the same as before, but the bootstrap standard error is slightly different from the original standard error. However, the bootstrap sampling process also brings some changes in estimation. Compared with the previous research, it can be considered that the model results are robust to a certain extent. The specific information is shown in Table 5.

Table 5. Bootstrap robustness test results

Double-selection logit model			**Number of obs**		=	**34,643**
			Number of controls		=	1
			Number of selected controls		=	1
			Wald chi2(2)		=	656.20
			Prob > chi2		=	0.0000
	Observed	Bootstrap			Normal-based	
Fraud	odds ratio	Std. err.	z	P>|Z|	[95% conf. interval]	
FL2	1.004058	.0003831	10.61	0.000	1.003307	1.004809
FL	.8618567	.0075904	-16.88	0.000	.8471074	.8768628
Controls	1	(offset)				

4.3. Further Verification by Mathematical Methods

In the analysis of logistic regression, according to the model, assume that the independent variable is x and the dependent variable is y, and the model can be expressed as In (P(y=1|x)/1-P(y=1|x))=$\beta_0+\beta_1x+\beta_2x^2$, β_0, β_1, β_2 Corresponding to the intercept term, the coefficient of the first - order term, and the coefficient of the second - order term respectively. When $\beta_1<0$ and $\beta_2>0$, There may be a U - shaped relationship. At this time, take the derivative of the log - odds with respect to x and set x equal to 0, and the possible extreme point can be obtained as $x=-\frac{\beta_1}{2\beta_2}$, Combining the above - obtained coefficient results, the extreme point is calculated to be approximately 17.09. This means that when FL is approximately 17.09, the log - odds may reach an extreme value. When FL < 17.09, $\beta_1+2\beta_2x<0$, the log - odds decreases as FL increases, that is, the probability of Fraud occurrence relatively decreases; when FL > 17.09, $\beta_1+2\beta_2x>0$, the log - odds increases as FL increases, that is, the probability of Fraud occurrence relatively increases. Also, because according to the above theory, the coefficient of FL is negative and the coefficient of FL2 is positive. According to the properties of the quadratic function, combined with the above theoretical analysis, in fact, the U - shaped relationship has been basically established, and the lowest point of the probability of being defrauded is when FL = 17. Looking at it from the perspective of derivatives, take the first - order and second - order derivative functions of the regression model respectively. Combining the known coefficients, the second - order derivative is always greater than 0, so the initial regression model is a concave function. When FL is less than 17.09, the function is monotonically decreasing, and the rate of decrease gradually slows down; when FL > 17.09, the function is monotonically increasing, and the rate of increase gradually speeds up. The change in the concavity and monotonicity of the function obtained by taking derivatives corresponds to the U - shaped relationship speculated above, further supporting the existence of the "U - shaped relationship" between financial literacy and the risk of being defrauded from a mathematical perspective.

In conclusion, the previous hypothesis H1 holds.

5. Conclusion and Suggestions

This article constructs a comprehensive index of financial literacy indicators using data from the 2019 China Household Finance Survey (CHFS) conducted by Southwest University of Finance and Economics. The Double selection Lasso Logit model is constructed to study the relationship between financial literacy and financial fraud, and mathematical arguments are introduced for further analysis of the model. Through empirical analysis, the following conclusions can be drawn: firstly, the improvement of residents' financial literacy can effectively reduce the occurrence of financial fraud, and personal characteristics of residents such as age, work status, political affiliation, etc. are important factors affecting whether residents suffer from financial fraud, and the more factors they have at the same time, the stronger the suppression of financial fraud. Secondly, financial literacy is not necessarily better with higher scores. The suppression of financial fraud is best achieved when the literacy score reaches 17.04, and as the score increases, the probability of being defrauded also slowly increases.

Based on the above research conclusions, this article proposes the following suggestions:

Firstly, it has been proven that improving residents' financial literacy can relatively reduce the occurrence of financial fraud. Therefore, government agencies should focus

on improving residents' own financial literacy. Firstly, it is necessary to enrich the forms of publicity and increase the promotion of daily anti-fraud knowledge. Communities and media need to cooperate with government departments to strengthen the prevention of financial fraud through a combination of online and offline models such as television advertising, community broadcasting, and posting notices, and comprehensively create a promotional atmosphere against financial fraud. Secondly, we need to target key groups who lack financial knowledge, such as elderly people in rural areas or young people who have just entered society, and position them as key promotional targets. At present, the Internet is the main medium for financial fraud, so local governments should put the target group of publicity in an appropriate position to improve the efficiency of publicity.

Secondly, people with high financial literacy need to be particularly vigilant about financial fraud. Fraudsters often use financial confidence to design hidden traps, such as stock and fund schemes targeting highly educated individuals, which can be difficult to prevent. To cope with this situation, high-quality individuals should carefully identify the content of information and not act blindly around individuals. When facing financial temptations, it is necessary to make cautious judgments and analyze carefully in order to avoid falling into traps.

References

[1] Lei Hanyun and Du Xiaoyan's "Financial Literacy, Financial Regulation, and Financial Fraud".

[2] Su Jie's "Technology Countermeasures against Financial Fraud".

[3] Lei Xiaoyan, Shen Yan, Yang Ling, Research on the Fraud of Chinese Elderly People in the Digital Age -- The Role of the Internet and Digital Inclusive Finance.

[4] Li Yuanyuan and Zhang Chunlei follow Li Rui's research on the role of residents' financial literacy in preventing financial fraud risks: an analysis of the mediating effect of risk preference.

[5] Zhou Xiqing's "Analysis of Illegal Financial Activities and Money Laundering Risks in Elderly Care Fraud".