The Influence of Social Interaction on Financial Fraud: Evidence from China

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Abstract

This paper analyzes the impact of social interaction on financial fraud by using the micro-data of China Family Finance Survey (CHFS) in 2015. The four agent variables that measure social interaction in this paper are the use of gifts payment, dining-out expenses and tourism expenditure. Studies have shown that social interaction has a significant positive impact on experience frauds, types of fraud experienced and lost by fraud. Therefore, raising the awareness and ability to self-screen information has played a crucial role in effectively preventing financial fraud.

Keywords

financial fraud; social interaction; endogenous interaction; situational interaction.

1. Introduction

In recent years, China's economy continues to boom and develop, while there are also risks, financial related economic fraud cases are common and fraud means continue to innovate, especially. Although the known cases of financial fraud have decreased in recent years, financial fraud is still a major public hazard in China's current economic activities. Thus, it has become the consensus of all sectors of society to prevent and crack down on financial fraud according to law. In China's "relational" society, social relations have become a factor that can not be ignored, but also a very complex phenomenon that cannot be accurately measured. With the continuous progress of information technology and the Internet, social interaction can occur across time and space, and it is also closely related to economic behavior. Considering the uneven quality of information transmitted, and even the existence of false information without any actual basis or proven, people make incorrect economic decisions. Therefore, it is necessary to prevent financial fraud from the perspective of social interaction.

2. Literature Review

Social interaction has become an important way for investors to exchange information and express their opinions in economic activities. The influence of social interaction on Residents' financial decision-making is increasing day by day, and financial fraud is often caused by wrong financial decision-making. The influence channel of social interaction on financial decision-making can be divided into two types: Endogenous Interaction and situational interaction (Durlurf, 2004). It is further found that the impact of Endogenous Interaction on Residents' investment decision-making is mainly manifested as: Residents' investment decision-making and interactive group members are interactive; scenario interaction is a one-way effect; residents' investment decision-making is affected by the exemplary effect of group members' early results(Manski,2000). it was divided into four categories of financial fraud including bank fraud, insurance fraud, securities and commodity fraud and other related Financial fraud(Ngai et al., 2011).

3. Model, Data and Variables

3.1. Model and Date

This paper uses the data of 2015 China Household Finance Survey (CHFS) collected by the Survey and Research Center for China Household Finance from 29 provinces in China with nearly 40,000 household samples. The dataset includes rich and detailed information including demographic characteristics, assets and debts, insurance and security, expenditures and incomes. We filter the data according to research needs of this paper, after eliminating missing values and fuzzy values of key variables, we obtain a sample with 33403 households.

In order to determine the effect of social interaction on financial fraud, since fraud experience is a binary variable, logit model is used to estimate the number of types of fraud and the amount of loss by fraud using OLS model. In which $Core\_X_i$ is social interaction; X_i represents all the control variables and α_1 α_2 is the coefficients that we wish to estimate. we estimate the following basic regression specification:

$$log(Fraud = 1) = \Phi(\alpha_1 Core\_X_i + \beta_1 X_i + \varepsilon_i) \qquad (1)$$

$$Y_i = \alpha_2 Core_{X_i} + \beta_2 X_i + \varepsilon_i \qquad (2)$$

3.2. Descriptive Statistics

The core independent variable of this paper is social interaction, whereas social interaction is an abstract variable that cannot be accurately measured, so we use three proxy variables to measure social interaction include that gifts payment, dining-out expenses and travel and tourism expenditure. We use three dependent variables to define financial fraud, which are financial fraud suffered, types of fraud experienced, and the amount of loss by fraud. The control variables refer to a set of additional variables such as gender, age, marital status, education ,family asserts and risk attitude. The specific description is shown in Table 1.

Table 1: Variable definitions

Variables	Variable description
Experience fraud	1 for household have experienced fraud; 0 otherwise.
Types of fraud experienced	Telephone fraud; SMS fraud; online fraud such as QQ, WeChat and fetion; phishing website fraud; acquaintance / face-to-face fraud (MLM, unfair merchandise transactions) and others, sum the above six types.
Lost by fraud	The logarithm of loss due to fraud
Gifts payment	The logarithm of the family's gift spending last year.
Dining-out expenses	The logarithm of the amount of household dining-out spending last year.
Tourism expenditure	The logarithm of the amount of household traveling spending last year.
Age	The age of householder
Gender	Male = 1; female = 0.
Education	Never attended school = 1; primary school education = 2; junior high school education = 3; high school education = 4; technical secondary school / vocational education = 5; junior college / vocational education = 6; bachelor's degree = 7; master's degree = 8; doctoral degree = 9.
Marital status	Married = 1; others = 0.
Risk attitude	Unwilling to take any risk = 1; slightly lower risk, slightly lower return = 2 projects; average risk, average return = 3; slightly higher risk and slightly higher return projects = 4; High risk and high return projects = 5.
Household assets	The logarithm of total household assets.

4. Analysis of Empirical Results

4.1. The Impact of Social Interaction on Experience Fraud

we have estimated the effects of social interaction on experience fraud using Logit. From the results of Table 2, we can find that the coefficients of the three core explanatory variables, namely gifts payment, dining-out expenses and Tourism expenditure are significantly positively correlated at the level of 1%.This means that individuals who have more social interaction are more likely to experience fraud. Moreover, columns(2),(4)and(6)report the estimated marginal effects.

Detailed data display that column (2) shows that the marginal effect coefficient between gifts payment and fraud experienced is 0.01205 in model 1, the implication is that for every 1% increase in gift payment, the probability of experiencing fraud will increase by 1.205%.The same is true for the other two proxy variables of social interaction. We analyze the role of social interaction in promoting the experience of fraud from two perspectives.

First of all, residents' financial decision-making may be based on the relevant information obtained through the social interaction of the surrounding people from the perspective of endogenous interaction. For example, word of mouth communication among company colleagues, neighbors and friends refers to the decision-making of group members who participate in social interaction through oral communication or observational learning(Guo S Q& Liang P H,2014), because the authenticity of information and the consistency of wealth level are not fully considered, the possibility of experiencing fraud is greatly increased. In addition, when people participate in social interaction and find that a certain investment made by others achieves a good effect, which will also prompt participants to directly follow suit without comprehensive analysis of the investment project from the perspective of situational interaction.

4.2. The Impact of Social Interaction on Types of Fraud Experienced

Table 3 shows the estimation results using types of fraud experienced as dependent

Variables by OLS model. The three proxy variables to measure social interaction are positively correlated with the types of fraud experienced. Specifically, when other control variables are fixed, one-unit increase of gifts payment, dining-out expenses and tourism expenditure will lead to an increase of types of fraud experienced by 2.85%, 3.46% and3.6%, respectively. This means that households with more social interaction are more likely to suffer more types of financial fraud residents.

Table 2: Estimation of social interaction on experience fraud

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Experience fraud		Experience fraud		Experience fraud	
Gifts payment	0.0555***	0.01205***				
	(0.00338)	(0.00072)				
Dining-out expenses			0.0564***	0.0123***		
			(0.00425)	(0.00092)		
Tourism expenditure					0.0595***	0.01298***
					(0.00425)	(0.0009)
Age	0.00305***	0.00066***	0.0046***	0.00101***	0.00207**	0.00045**
	(0.000923)	(0.000200)	(0.000936)	(0.0002)	(0.000919)	(0.0002)
Gender	-0.101***	-0.0218***	-0.111***	-0.0243***	-0.0890***	-0.0194***
	(0.0241)	(0.00523)	(0.0241)	(0.00524)	(0.0241)	(0.005247)
Marital status	-0.142***	-0.0309***	-0.0767**	-0.0167**	-0.0803**	-0.01752**
	(0.0349)	(0.007576)	(0.0346)	(0.00755)	(0.0346)	(0.00755)
Education	0.229***	0.0498***	0.219***	0.04773***	0.209***	0.04557***
	(0.00878)	(0.001839)	(0.00888)	(0.00187)	(0.00899)	(0.0019)
Household assets	0.193***	0.0419***	0.192***	0.04188***	0.187***	0.04079***
	(0.00831)	(0.00175)	(0.00833)	(0.00176)	(0.00838)	(0.00177)
Risk attitude	0.0680***	0.01478***	0.0618***	0.01348***	0.0589***	0.01285***
	(0.0113)	(0.00128)	(0.0113)	(0.002455)	(0.0113)	(0.002457)
Constant	-3.244***	-3.244***	-3.164***	-3.164***	-2.856***	-2.856***
	(0.117)	(0.117)	(0.116)	(0.116)	(0.119)	(0.119)
Observations	32783		32783		32783	

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard deviations in parentheses.

Among the control variables of the following three models, we observed that age and marital status on types of fraud experienced showed a significant negative relationship. Which tells us that when the age increases to a certain extent, people's information channels to contact the outside world gradually decrease, so that the scope of information is shrinking. As a result, individuals will experience fewer types of fraud.

Table 3: Results of social interaction on types of fraud experienced

Variables	(1)	(2)	(3)
	Types of fraud experienced	Types of fraud experienced	Types of fraud experienced
Gifts payment	0.0285***		
	(0.00175)		
Dining-out expenses		0.0346***	
		(0.00217)	
Tourism expenditure			0.0360***
			(0.00197)
Age	-0.00367***	-0.00264***	-0.00418***
	(0.000465)	(0.000472)	(0.000464)
Gender	0.000386	-0.00496	0.00938
	(0.0122)	(0.0122)	(0.0122)
Marital status	-0.113***	-0.0804***	-0.0812***
	(0.0174)	(0.0174)	(0.0174)
Education	0.135***	0.128***	0.120***
	(0.00420)	(0.00427)	(0.00434)
Household assets	0.104***	0.102***	0.0973***
	(0.00418)	(0.00421)	(0.00423)
Risk attitude	0.0510***	0.0465***	0.0435***
	(0.00567)	(0.00569)	(0.00569)
Constant	-0.578***	-0.532***	-0.322***
	(0.0578)	(0.0578)	(0.0594)
Observations	32,761	32,761	32,761
R-squared	0.131	0.131	0.133

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard deviations in parentheses.

4.3. The Impact of Social Interaction on Lost by Fraud

Table 4 presents the estimation results of the impact of social interaction on lost by fraud. As demonstrated in this table, the estimated coefficients of gifts payment and dining-out expenses are both positive and significant at 1% levels respectively, indicating that social interactions measured by gifts payment and dining-out expenses have a positive effect on lost by fraud in model1and 2. Moreover, another agent variables that tourism expenditure is significant at10% , suggesting that there is a significant positive relationship between social interaction and the amount of loss by fraud.

Concerning the control variables, we find that risk attitude and household assets all have significant positive effect on the amount of fraud losses. It can be explained that the wealth effect obviously reflects that the residents hope to achieve the purpose of wealth growth by holding household savings to holding financial assets. With the increase of household income level and the increase of investment capital in the financial field, the loss caused by fraud will be greater. In addition, Individuals with risk preference will suffer more from fraud. Generally speaking, the residents with risk preference are full of confidence in the investment decisions they make. In order to obtain a high return matching with their own risks, they will enlarge the investment amount as much as possible.

Table 4: Results of IV regressions

Variables	(1) Lost by fraud	(2) Lost by fraud	(3) Lost by fraud
Gifts payment	0.00735***		
	(0.00221)		
Dining-out expenses		0.00815***	
		(0.00274)	
Tourism expenditure			0.00475*
			(0.00249)
Age	0.00232***	0.00255***	0.00221***
	(0.000588)	(0.000597)	(0.000587)
Gender	-0.0195	-0.0209	-0.0186
	(0.0155)	(0.0155)	(0.0155)
Marital status	-0.0796***	-0.0714***	-0.0724***
	(0.0220)	(0.0220)	(0.0220)
Education	0.00439	0.00279	0.00307
	(0.00531)	(0.00539)	(0.00549)
Household assets	0.0195***	0.0192***	0.0200***
	(0.00529)	(0.00532)	(0.00536)
Risk attitude	0.0218***	0.0208***	0.0210***
	(0.00717)	(0.00719)	(0.00720)
Constant	-0.151**	-0.140*	-0.117
	(0.0730)	(0.0731)	(0.0752)
Observations	32783	32783	32783
R-squared	0.002	0.002	0.002

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard deviations in parentheses.

4.4. Endogenous Problem

Considering this endogenous problem, there may be a two-way effect between social interaction and financial fraud. Therefore, in order to avoid potential endogenous problems affecting the unbiased conclusions, we use the data of the social interactions of the respondents in the 2013 CHFS survey to correct potential endogenous problems. Its principle is to overcome the possible reverse causality caused by using 2015 data at the same time through analyzing the impact of social interaction in 2013 on financial fraud in 2015. The social interaction in 2013 meets two conditions of an effective instrumental variable is relevance and externality. Firstly, the social interaction in 2013 is inevitably related to the social interaction in 2015. Secondly, the financial fraud in 2015 cannot affect the social interaction in 2013.

At beginning, we execute Hausman tests in order to identify the endogeneity of three proxies for social interaction. it is found through tests that only the expenditure on dining out is endogenous. Table 5 reports the estimated results of the two-stage regression using instrumental variables performed with iv-probit command. A general rule of thumb requires an F value in the first stage at least 10 to expel the concern of weak instruments (Stock et al., 2005). As exhibited in table 6, F-values of the first stage are 230 and 154, respectively, which are much larger than the critical value of 10, suggesting that there is no worry of weak instruments in the regressions. In short, social interaction still increases the possibility of financial fraud, the number of frauds experienced and the amount of loss by fraud.

Table 5: Results of IV regressions

Variables	Iv-probit	Iv-regress
	Experience fraud	Types of fraud experienced
Dining-out expenses	0.109***	0.0927***
	(0.0367)	(0.0339)
Controls	Controlled	Controlled
Constant	-1.768***	-0.453**
	(0.254)	(0.197)
First stage F value	230	154
Wald test/DWH	4.60**	3.37698*
Observations	4672	4669

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard deviations in parentheses.

5. Conclusion

With the rapid development of Internet technology and information, we used the data of China Household Finance Survey Center (CHFS) in 2015 to analyze the impact of social interaction on financial fraud. Our results imply that the three proxy variables of social interaction have significant positive effects on the three dependent variables of financial fraud. In other words, compared with the group with less social interaction, the higher the degree of social interaction will not only increase the possibility of experiencing fraud, but also suffer more kinds of fraud and lose more money in fraud. The results of endogeneity test also verified the validity of the conclusion.

According to our research conclusions, the following suggestions are put forward. First of all, individuals should keep calm and rational in social interaction, make reasonable financial decisions based on their own wealth status and avoid falling into the trap of financial fraud. Secondly, we should take the responsibility and obligation as social citizens, participate in social interaction in a healthy way, avoid transmitting signals and emotions of blind optimism or excessive pessimism to minimize the negative effects of social interaction. Finally, the government or regulatory agencies should create a harmonious information sharing atmosphere to maintain the order of financial management, further guide investors' behavior to become rational, and make positive contributions to the development of the market.

References

[1] Durlurf,S.N.,2004,"Neighborhoods Effects",WorkingPapers,4(1):343~362.

[2] Durlauf S N, Ioannides Y M. Social Interactions[J]. Annual Review of Economics, 2010, 2(1): 451-478.

[3] Stock,J.H.andM.Yogo,2005,"Testing for Weak Instruments in Linear IV Regression",NBER Technical Working Papers, 14(1):80~108.

[4] Manski, C. F. , 2000, "Economic Analysis of Social Interaction", Journal of Economic Perspectives , Vol. 14, 115-136.

[5] Guo S Q, Liang P H.(2014) Social interaction, information channels and household stock market participation: An Empirical Study Based on 2011 Chinese Household Finance Survey, Journal of Economic Research, 2014,(S1):116–131. (In Chinese).

[6] Ngai E W T, Hu Y, Wong Y H, et al. The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature[J]. Decision support systems, 2011, 50(3): 559-569.

[7]　Wang J., Duan P X., Zhang X Y.(2018) Research on the Current Situation and Problems of Financial Fraud--Based on the Empirical Investigation of Jinzhong District in Beijing, Finance, 2018,8(3):72-76. (In Chinese).