

温州肯恩大学
WENZHOU-KEAN UNIVERSITY

The causes, risks and countermeasure of private lending in China

In Partial Fulfillment of the Requirements

for the Bachelor of Science in Finance

by

ZHANG Zhiyi

1026000

May, 2020

Table of Content

ABSTRACT.....	1
1. INTRODUCTION.....	2
2. LITERATURE REVIEW	
2.1 The causes of private lending from banks or financial structure.....	4
2.2 The risk of private lending.....	4
2.2.1 The risk of private lending in national level.....	4
2.2.2 The risk of private lending in individual level.....	4
2.3 The countermeasures to private lending from perspective of laws.....	5
2.3.1 Reconstruction of legal rules.....	5
2.3.2 Incentive legal regulation of private lending.....	5
3. DATA AND SAMPLE	
3.1 Dataset.....	6
3.2 Sample.....	7
4. METHODOLOGY & MODEL	
4.1 Methodology selection.....	7
4.2 Model selection and hypothesis testing.....	7
5. DATA ANALYSIS AND RESULTS.....	8
6. CONCLUSION.....	12
7. REFERENCES.....	13
8. TABLES AND FIGURES	
Figure 1 (The number of formal financial institutions in China from 1993-2018)	
Figure 2 (The scale of private lending in China from 1993-2018)	
Table 1-2 (The regression analysis about the number of formal financial institutions and the scale of private lending)	
9. APPENDIX	
Appendix A (The regression analysis about the number of formal financial institutions and the scale of private lending in China from 1993-2018)	
Appendix B (The value of Θ_1 and Θ and the scale of informal finance and private lending / the number of formal financial institutions in China from 1993-2018)	

Abstract

Private lending has a long history in China and to some extent, private lending has indeed facilitated our life. However, with the continuous development of China's economy, private lending exposes more and more problems. Consequently, it's important to know the private lending in depth especially after the serious private lending crisis occurred in Wenzhou in 2011.

In this way, this essay will try to find the relationship between the number of formal financial institutions and the scale of private lending in China. Model is created based on literature review and other scholars' study. In this essay the methodology that be used is correlation and regression analysis. This essay uses the economic and financial correlation coefficient rule to estimate the scale of private lending. This essay uses insufficient data to do analyze and hence its result is inconsistent with many other scholars' results. Depending on this contradictory consequence, some points are figured out to explain the reason and also some suggestions are mentioned in order to help or remind other researchers when they do relevant studies.

Keyword: private lending, economic and financial correlation coefficient rule, the number of formal financial institutions, the scale of private lending, regression analysis

1. Introduction

Private lending is a folk financial behavior which is different from the formal financial services. Private lending usually exists between individual citizens, between individuals and businesses, between individuals and institutions. The private lending is valid as long as both parties express their true intentions. Under normal circumstances, the interest rates of private lending will not be higher than the relevant interest rates which are stipulated by banks. However, due to the chronic lack of formal and effective management and supervision of laws and regulations, usury incidents are frequent. Nevertheless, private lending is still one of the important components of folk financial behavior.

Private lending is a kind of spontaneous economic behavior and it can make up for the gap in the financial market, especially when the market is growing fast but the legislation in the relevant economic area is slow. In China, the structure of the financial system is not suitable to the rapidly developing market economy, which means the reform of the financial system cannot keep up with the actual needs of the market. In this case, private lending has plenty of space to grow. However, due to the lack of relevant systems and laws, the risk of private lending cannot be effectively eliminated. Problems such as usury, capital chain rupture, accounting fraud, more debt problems and others disrupt the normal financial order to a certain extent. In 2011 in Wenzhou, China, the capital chains of some small and medium-sized enterprises broke. Nearly 90 business owners fled because they couldn't pay off high debts, which were caused by usury (Runbei Wang, 2013).

In order to maintain the order of normal financial and ensure the smooth operation of the market, it's necessary to make effective laws and regulations in the field of private lending, no matter these laws and regulations support the development of private lending or restrict the development of private lending. With the gradual expansion of the contradictions between the market and the backward financial system, it is very important to seek countermeasures in the field of private lending.

In this paper I focus on three issues: the causes of private lending, the risks of private lending and some countermeasures to these risks.

In this paper, I will first try to find some causes of private lending. Although many articles and papers have already analyzed the causes of private lending, I will narrow down the perspective of finding the reasons because some reasons like cultural and historical are not very suitable to the purport of this paper. Thus I will focus on bank or financial structure and attempt to discover reasons.

Many articles and papers also have already mentioned the risks of private lending, but I will pay more attention to national and individual level. Risks at the national level are relate to what I want to talk about in the countermeasure part. Risks at the individual level are very close to our life and these risks are obvious and

destructive. In this way I think these risks can roughly summarize the hidden dangers of private lending.

In the countermeasure part, I will look for solutions mainly from the perspective of laws. The reason is that I think the lack of laws and regulations are the main problems. I feel it is difficult for the countermeasures from the perspective of individuals to effectively regulate private lending because many risks of private lending are caused by the absence of formal supervision. Even if individuals refuse to engage in private lending, the risks of private lending will still remain. Therefore, the fundamental method is to regulate private lending reasonably from the legal level.

In this way, the remainder of this paper is organized as follows. In section 2 I will review the existing literatures in this field and find some useful points. Section 3 comes up with a hypothesis or guesses and describes them in more detail as well as data samples. Section 4 I will introduce methodology and model that I used during the research to describe my train of thoughts. In section 5 I will show main results of my data analysis and give some simple conclusions. If possible, I will give some reasons to explain my research if my result is inconsistent with other scholars' results. In section 6 I will conclude the whole essay. Then is references and appendix.

2. Literature Review

There are many articles and papers that mentioned about private lending. The research in this aspect is quite sufficient.

2.1. The causes of private lending from banks or financial structure

Many scholars have already studied on this field. Runbei Wang (2013), Shixin Li et al. (2009), Weihong Tang et al. (2013) and Shenglin Zhang et al. (2002) tried to find causes of private lending and they mentioned lots of reasons from different perspectives. In the introduction part I say that in this paper I will mainly focus on causes from banks or formal financial institutions. Remove some of the less relevant reasons, many of them mentioned causes what I really want. Formal channel fund supply is insufficient, formal borrowing threshold is high, formal investment channels are narrow and weak financial regulation are all reasons and all of those causes are related to what I want to talk about.

2.2 The risks of private lending

In fact the risks of private lending could be seen at all levels. However, in this research I just pay attention to national and individual level.

2.2.1 The risks of private lending in national level

Private lending can lead to different kinds of problems in different aspects of our life. Actually, the article I mention before, they also involve risks problems. Runbei Wang (2013) mainly talked about risks in national level especially regional risks. The rest scholars like Shixin Li (2009), Weihong Tang (2013) and Shenglin Zhang (2002), they mainly figured out the risks about macroeconomic regulation and control. In addition to these scholars, Douglas Elliott et al. (2015), Wei Shen (2014), Swati Ghosh et al. (2012) and Khandokar Istiak (2019) tried to find risks of private lending from national perspective. Private lending is one of the main forms of shadow bank. They talked about the existence of shadow bank and mentioned many problems of shadow bank. Their articles and papers fully illustrate the impact of shadow bank on the financial system.

2.2.2 The risks of private lending in individual level

Individuals' risks are obvious and normally be included in many articles. Li, Tang and Zhang all mentioned risks in individual level. Economic disputes and usury are major problems. There are many other scholars that studied risks in individual level. Hans Visser (2014) mentioned the history of usury and debt as well as Lindgren Hakan (2017). Ibrahim Abraham et al. (2007), Melvin R. J. Soudijin et al. (2013), Xiaoyan Zhang (2010), Robert Mayer (2013) and Anthony Saunders (2011) all cared about the risks of usury which is caused by the private lending. In the context of the new era, peer-to-peer online lending becomes more and more popular. The problems that follow the spread of peer-to-peer lending are becoming more and more obvious. As a new form of private lending, the risks which are brought by online lending or P2P lending cannot be ignored. Haewon Yun et al. (2012), Zhengping Zhang et al. (2013), Seth Freedman et al. (2017)

and Huijuan Wang et al. (2014) all talked about the risks of P2P lending. The risks of online lending they discussed partly reflect those of private lending.

2.3 The countermeasures to private lending from perspective of laws

Just as causes and risks parts, there also have many countermeasures to private lending but I mainly choose solutions from legal perspective.

2.3.1 Reconstruction of legal rules

Scholars who held this idea usually thought about all-round change. It doesn't mean they wanted to make laws and regulations in relevant fields again, but they thought the original legal systems and ideologies were not suitable to continue to exist in the new environment. They believed the solutions to the risks of private lending should not be limited to the formulation and improvement of laws as well as the value system of laws. Shuqing Zhang (2009) and Zhaoxiang Qiu et al. (2009) thought people could not only make new laws and regulations to guide private lending but also change outdated ideas to adapt to the new era. They believed besides make new laws, people should build new values in laws like efficiency value, freedom value, order value, justice value and so on.

2.3.2 Incentive legal regulation of private lending

Wall is better than hydrophobic. If on the one hand, we cannot prevent private lending, on the other hand we need private lending to fill the gap in the market funds to some extent. In this way, make some laws and regulations to guide private lending is appropriate. Caishen Yue (2013) and Shenglin Zhang et al. (2002) thought we should make some incentive legal regulations to let private lending take participate in formal financial behavior. In this way, compare to reconstruct of legal rules, it seems like improvement and reform.

In the next section I will describe relevant information about data and some detailed explanations.

3. Data and Sample

In this part I will introduce which data I will select and how and where I get these data. At the same time I will show the scale of samples and explain the reason why I choose this sample size.

3.1 Dataset

I want to find the relationship between the scale of private lending and the number of formal financial institutions in China because I think the more formal financial institutions, the less private lending scale. In this way I need to search data about private lending and formal financial institutions.

It's very difficult to find exact data about the scale of private lending because of its concealment and universality. Thus what I will do is to use some relevant data to estimate the scale. The method I will use is economic and financial correlation coefficient rule, which estimates the scale of private lending based on the ratio of credit financing to GDP. Many scholars used this method to estimate private lending such as Li Jianjun (2005) and Peng Fangchun (2010). Although they used the same method, the specific formula they applied was different. Therefore, the results they found were very different, which means I cannot use them directly. What's more, most of their data were 15 years ago, I won't use them. As a result I will recalculate the scale of private lending with the help of new data.

For the formula, I use the format that Wang Runbei (2013) applied in his paper.

First, set Θ as the economic and financial correlation coefficient, and the relationship about Θ is that: $\Theta = (FF + IF)/GDP$, which FF is formal finance and IF is informal finance.

For FF, the formal finance, we set its elements are foreign direct investment (FDI), securities market financing (SMF) and short-term credit (SC), which means: $FF = FDI + SMF + SC$. The reason why choose short-term credit is because many private lending is short-term. For SMF, it will just contain IPO as other data are very hard to find.

In order to calculate the scale of private lending, we need a benchmark or standard of Θ or we say Θ_1 . For the convenience of calculation, the informal finance (IF) will be ignored because IF is very hard to find due to its concealment. So in order to calculate the most accurate Θ_1 , we will select Shanghai's Θ as our Θ_1 . The reason is that the more developed the city, the less the scale of informal finance.

When Θ_1 is calculated, we can use the same way to calculate the Θ of China. There must has a difference between Θ_1 and Θ , and the result of $(\Theta_1 - \Theta)*GDP$ is informal finance or private finance E_i .

Finally set a relationship between formal finance and informal finance, and the relationship is: $C_f/E_f = C_i/E_i$, which C_f is formal financial short-term borrowing scale, E_f is

formal financial scale, C_i is informal financial short-term borrowing scale or we say the scale of private lending and E_i is informal financial scale. In this way $C_i = E_i * (C_f/E_f)$, so C_i is what I want to calculate. However I think it's hard to define the elements of formal financial scale and the formal financial short-term borrowing scale. In this way I will use the scale of domestic financial transaction capital utilization and the loan that used in domestic financial transaction to represent E_f and C_f .

All the data I use come from China Financial Statistics Yearbook 1993-2018, China Securities, Futures Statistical Yearbook 1993-2018, Shanghai Statistical Yearbook 1993-2018 and National Bureau of Statistics of China.

The data about the number of formal financial institutions in China is easy to search and the source of my data is Wind, a provider of financial data and analysis tools in China, and the China Banking Regulatory Commission

3.2 Sample

I will use historical time-series data to analyze the relationship. The sample period of my data is from 1993 to 2018. I actually want to find more than 30 samples, but in Shanghai's Yearbook, the short-term credit was started to record since 1993 and consequently the most data or sample size I can find is from 1993-2018, which is totally 26 samples.

4. Methodology & Model

As I find enough relevant data about my research question, than what I will do is select an appropriate methodology and model to test my hypothesis.

4.1 Methodology Selection

Because I want to find the relationship between the scale of private lending and the number of formal financial institutions in China, in this way the methodology I will use is the correlation analysis and with the help of regression analysis to research specific relationship. Both of these two data are variables and I want to find whether there is a specific number that can link these two data together.

4.2 Model Selection and Hypothesis Testing

There are many factors can affect the scale of private lending but I just want to focus on the relationship between the number of formal financial institutions and the scale of private lending. Hence, both the scale of private lending and the number of financial institutions are variables and in this way the model I can created is:

$$Y = \alpha + \beta_1 * x_1 + \beta_2 * x_2 + \beta_3 * x_3 + \beta_4 * x_4 \dots$$

Or:

The scale of private lending = $\alpha + \beta_1$ *the number of formal financial institutions + β_2 *the formal channels for fund supply + β_3 *formal borrowing threshold + β_4 *formal investment channels.....

My hypothesis (H0) will be: there has no relationship between the number of financial institutions and the scale of private lending.

The reason why I choose this hypothesis is that I think most private lending is caused by the lack of financial institutions and the more financial institutions, the less private lending will be. In this way, if there actually has a relationship between them, than what we can do to resolve or reduce the problems which were brought by private lending is to increase the number of financial institutions to let formal financing channels expand coverage. Thus most economic activities will be regulated and usury or other risks can be effectively avoided.

5. Data analysis and results

This section explains the relationship between the number of financial institution and the scale of private lending in China. As I mentioned in the literature review, many scholars such as Runbei Wang (2013), Shixin Li et al. (2009) and Shenglin Zhang et al. (2002), thought the lack of financial institutions could cause the increase of the scale of private lending. In order to test whether this viewpoint is right or not, I also make a model to estimate the relationship between those two variables as I mentioned before:

The scale of private lending = $\alpha + \beta_1$ *the number of financial institutions + β_2 *formal channels for fund supply + β_3 *formal borrowing threshold + β_4 *formal investment channels.....

Thus the scale of private lending is a dependent variable and the number of financial institutions is an independent variable.

For the completeness of the test, my hypothesis is: there is no relationship between the number of financial institutions and the scale of private lending in China.

I choose data from National Bureau of Statistics of China, Shanghai Yearbook, China Banking Regulatory Commission, China securities and futures yearbook. China financial statistics yearbook and Wind consulting Company. The sample I can get is from 1993 – 2018, which is 26 samples. As I mentioned before, due to the lack of some information in Shanghai's Yearbook, I can't get enough data. Therefore, it may have some errors to my results. The following part is what I get from my data sample:

Figure 1: the number of formal financial institutions in China from 1993-2018

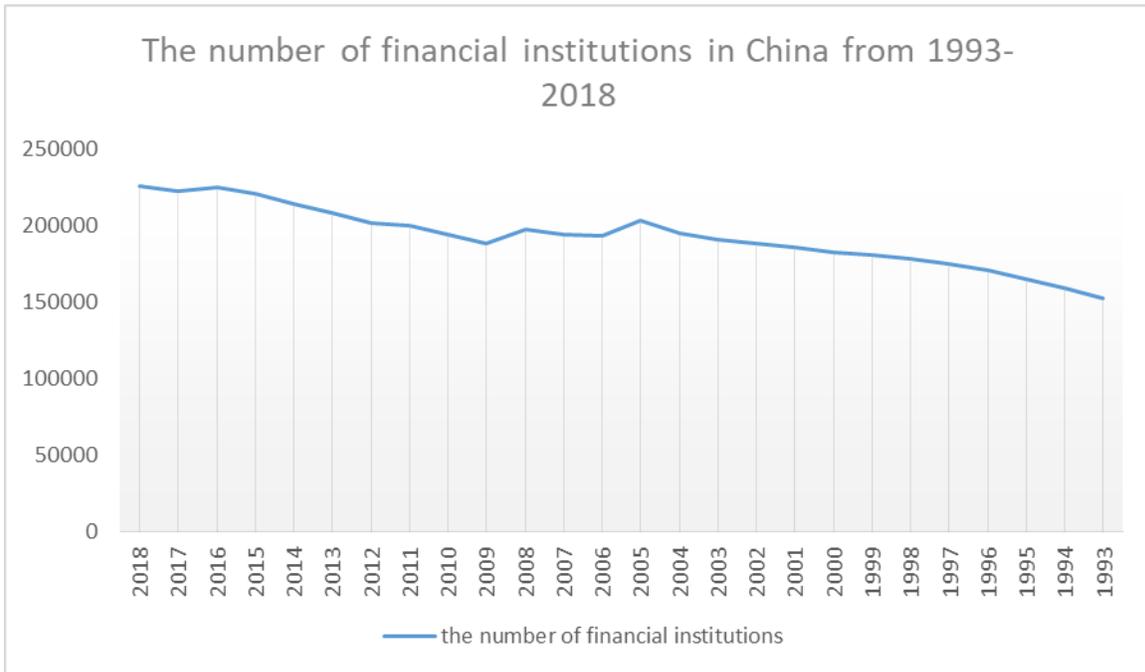


Figure 2: the scale of private lending in China from 1993-2018

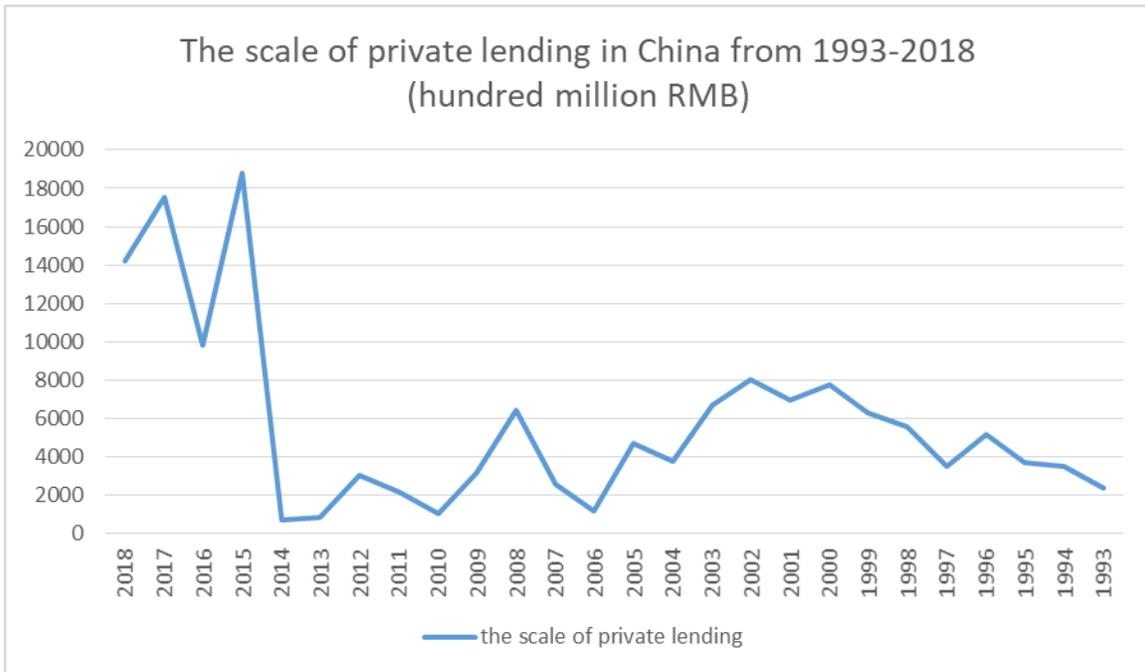


Table 1, 2: the regression analysis about the number of formal financial institutions and the scale of private lending

Regression Statistics	
Multiple R	0.486210080954009
R Square	0.236400242821304
Adjustment R Square	0.204583586272192
Standard Error	4261.20084973464
Observations	26

	Coefficients	P-value
Intercept	- 16965.49723	0.054163996
X Variable 1	0.117959426	0.011786678

If I set 0.1 as α so my confidence interval is 90% and because the P-value is equal to 0.01178, which is smaller than 0.1, so I should reject my hypothesis. In this way I can say my hypothesis H_0 is defective and I should reject it. The appropriate expression is that:

There has a relationship between the number of formal financial institutions and the scale of private lending in China from 1993-2018.

However, just as I mentioned before, due to the lack of enough samples, the result I get may have some errors to the actual possibilities. Nevertheless, in order to continue to analyze, let's say the data I get is feasible. Looking at the regression statistics part, the coefficient part for x variable 1 is 0.11796, which is bigger than 0, so there has a positive relationship between the number of formal financial institutions and the scale of private lending in China. However the absolute value of the multiple R isn't very large or close to 1, and also the R square is just 0.2364, which is much less than 1, both two values show that the correlation between the number of formal financial institutions and the scale of private lending isn't very strong. Nevertheless, it actual shows a positive relationship.

Nevertheless, this result is different from what other scholars said and also it's not consistent with what I really want. As I mentioned before in the literature review, in my first research question I want to find the causes of private lending and many scholars like Runbei Wang (2013), Shixin Li et al. (2009), Weihong Tang et al. (2013) and Shenglin Zhang et al. (2002) all thought there had a negative relationship between the number of formal financial institutions and the scale of private lending. They believed the reason why people borrowed money interpersonally was because the lack of formal financial institutions or the narrow coverage of formal financial institutions. In this way, I want to

find whether there actually has a negative relationship between these two variables. Unfortunately, the data I get figure out that there has a positive relationship between these two variables. In fact, if there has a negative relationship between these two variables, I can give suggestions and advice to reduce the scale of private lending to eliminate possible risks that may be brought by it. Nevertheless, the positive correlation shows all I think is inconsistent with other scholars' articles.

I think some reasons why my result is different from other scholars':

Firstly, I simplify the definition of securities market financing to make it easier to collect data. In fact, securities market financing includes IPO, refinance and bond market financing and IPO includes three types, refinance includes four forms and bond market financing includes four ways. In my section I just choose IPO and ignore other two factors. In this way it may lead some errors.

Secondly, the difference of short-term credit. In China Statistics Yearbook or National Bureau of Statistics of China, the short-term credit doesn't distinguish between subjects, which means it doesn't list resident short-term credit and company short-term credit separately. Thus I can just use the amount of money used by formal financial institutions comes from short-term credit to replace the short-term credit. In Shanghai Yearbook, it clearly list resident short-term credit and company short-term credit. As a result it will have some errors in the calculation of Θ .

Thirdly, the change of formula. In Runbei Wang's (2013) article, he introduced the formula $C_f/E_f = C_i/E_i$, which C_f is the size of short-term lending in formal finance and E_f is the scale of formal finance and C_i and E_i are the corresponding informal size. However, I cannot find the actual number of these variables especially the C_f and E_f . Hence, I use domestic financial transaction capital utilization scale to replace E_f and use domestic financial transaction funds use loan to replace C_f . Thus, the data I get may very different from the actual ones.

Fourthly, the lack of samples. Shanghai Yearbook stated to record short-term credit since 1993, so I just get 26 samples from 1993-2018, which is lower than the minimum requirement, 30. Monthly data and quarterly data may be better but Shanghai's statistics are released annually. What's more, I cannot find a very reliable source for China's monthly or quarterly data and China's national bureau of statistics publishes different types of monthly, quarterly and annual data. Many data I want are just published annually.

Fifthly, the samples that other scholars' used were out of date and their data sizes were also not enough or more than 30. In this way, their results might have some errors to actual conditions. Even so my result is inconsistent with their results, these scholars' conclusions may have some defects.

I think the above reasons are very important since I changed their meanings compare to Runbei Wang's article and they may the main causes of my results' errors. To some extent, my research is failed because my results are different from many other

scholars' studies. However, my research may can remind other people to pay more attention to the collection of data and make sure to use similar or same methods to calculate whenever possible.

6. Conclusion

In this essay I originally want to discuss the relationship between the scale of private lending and the number of formal financial institutions in China. Depending on the literature review, I know there has a negative relationship between these two variables. I choose 1993-2018 China's conditions as my subject to estimate the scale of private lending and measure the linear relationship. Although my result is inconsistent with other scholars' results, I think there have some valuable conclusions:

First, the data I used is latest but other scholars' samples were out of data. What's more, these scholars' sample size were not enough as well, in this way I have reason to believe that my conclusion has some credibility, even if the reliability is low.

Second, it's important to gain enough data to increase the stability of data or results. As I mentioned before I simplify many formulas and equations to better gather information and subsequently it may lose some credibility and bring errors to my results. Thus when other people do researches and analysis, please make sure to collect adequate information.

Third, it's also the defect I want to comment. In my essay I only choose Shanghai as Θ_1 to calculate the scale of private lending in China but if I want to increase the reliability of my result, I need to select other city's Θ to improve correctness.

Reference

- Anthony Saunders & Sascha Steffen, (2011). The Costs of Being Private: Evidence from the Loan Market, *the Review of Financial Studies* 2011 Vol: 24 4091-4122
- Caishen Yue, (2013). Incentive Legal Regulations on Private Lending, *Social Science in China* 2013(10) 121-139+207
- Constant J. Mews & Ibrahim Abraham, (2007). Usury and Just Compensation: Religious and Financial Ethics in Historical Perspective, *Journal of Business Ethics* 2007 Vol: 72 (1) 1-15
- Douglas Elliott & Arthur Kroeber & Yu Qiao, (2015). Shadow Banking in China: A Primer, *Economic Studies at Brookings* 2015
- Fangchun Peng, (2010). Analysis of Private Finance in Midwest China: Wuhan Characteristics and Scale Measurement, *Statistics & Decision* 2010(10): 107-109
- Haewon Yun & Byungtae Lee & Myungsin Chae, (2012). From the wisdom of crowds to my own judgment in microfinance through online peer-to-peer lending platforms, *Electronic Commerce Research and Applications* 2012(5) 469-483
- Hans Visser, (2014). Geisst, Charles R.: Beggar thy neighbor. A history of usury and debt, *Journal of Economics* 2014 Vol: 111 (1), 97-99
- Huijuan Wang & Li Liao, (2014). Research on Credit Authentication Mechanism of China's P2P Network Loan Platform: Empirical Evidence from "Renren Loan", *China Industrial Economics* 2014(4) 136-147
- Jianjun Li, (2005). The Scale of Underground Finance and its Impact on Macroeconomy, *Chinese Financial* 2005(4): 25-28
- Khandokar Istiak, (2019). The nature of shadow bank leverage shocks on the macro economy, *North American Journal of Economics and Finance* 2019
- Lindgren Håkan, (2017). Parish banking in informal credit markets: the business of private lending in early nineteenth-century Sweden, *Financial History Review* 2017
- Melvin R. J. Soudijin & Sheldon X. Zhang, (2013). Taking loan sharking into account: a case study of Chinese vest-pocket lenders in Holland, *Trends in Organized Crime* 2013 Vol: 16 (1) 13-30
- Robert Mayer, (2013). When and Why Usury Should Be Prohibited, *Journal of Business Ethics* 2013 Vol: 116 (3) 513-527
- Runbei Wang, (2013). An Analysis of the Causes and Regional Effects of Private Lending in China, *Shandong University of Finance and Economics* 2013-05-25 56

- Seth Freedman & Ginger Zhe Jin, (2017). The information value of online social networks: Lessons from peer-to-peer lending, *International Journal of Industrial Organization* 2017 185-222
- Shenglin Zhang & Yingmin LI & Yinguang Wang, (2002). Transaction Cost and Spontaneous Incentive: A Survey of Private Lending in Traditional Agricultural Areas, *Journal of Financial Research* 2002(2) 125-134
- Shixin Li & Yaomou Zhang & Li Li & Cailin Zheng, (2009). Causes, Problems and Countermeasures of Current Private Lending in China, *Journal of Regional Financial Research* 2009(5) 33-36
- Shuqing Zhang, (2009). Reconstruction of the Legal Value System of Private Lending, *Shanghai Finance* 2009(2) 69-73
- Swati Ghosh & Ines Gonzalez Del Mazo & inci Ötoker-Robe, (2012). Chasing the Shadows: How Significant is Shadow Banking in Emerging Markets? *World Bank*
- Weihong Tang & Weifeng Yang, (2013). Causes, performance and preventive measures of private lending risks, *West Forum on Economy and Management* 2013(3) 68-72
- Wei Shen, (2014). China's Shadow Banking Risks and the Choice of Regulatory Tools, *China Legal Science* 2014(4) 151-177
- Xiaoyan Zhang, (2010). Reasons for the High Interest Rate of Rural Private Lending and Normative Measures, *On Economic Problems* 2010(08) 67-69+80
- Zhaoxiang Qiu & Mingkun Shi, (2009). Thoughts on Legalization of Private Lending, *Financial Theory & Practice* 2009(3) 21-24
- Zhengping Zhang & Xialu Hu, (2013). P2P Network Lending: International Development and China's Practice, *Journal of Beijing Technology and Business University (Social Sciences)* 2013(02) 87-94

Tables & Figures

Figures 1: The number of formal financial institutions in China from 1993-2018

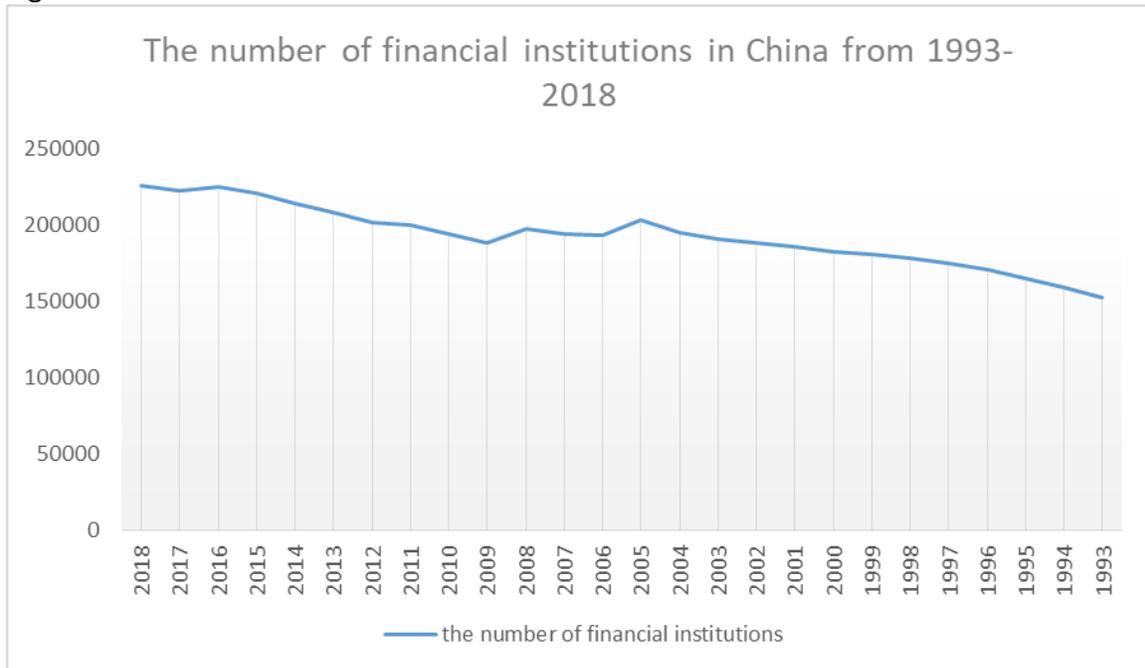


Figure 2: The scale of private lending in China from 1993-2018

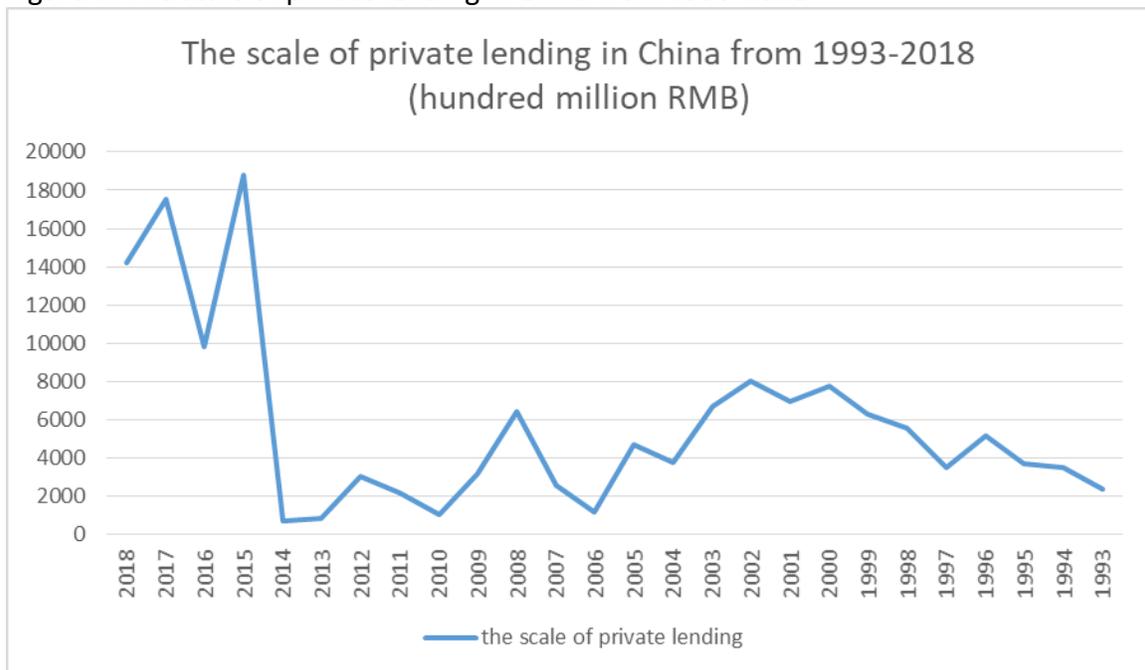


Table 1-2: The regression analysis about the number of formal financial institutions in and the scale of private lending in China from 1993-2018

Regression Statistics	
Multiple R	0.486210080954009
R Square	0.236400242821304
Adjustment R Square	0.204583586272192
Standard Error	4261.20084973464
Observations	26

	Coefficients	P-value
Intercept	- 16965.49723	0.054163996
X Variable 1	0.117959426	0.011786678

Appendix A: The regression analysis about the number of formal financial institutions and the scale of private lending in China from 1993-2018

In this essay I just pack some important data in regression analysis and the following picture shows the whole result I get from the regression.

Picture 1: The regression analysis about the number of formal financial institutions and the scale of private lending in China in from 1993-2018

SUMMARY OUTPUT								
<i>Regression statistics</i>								
Multiple R	0.486210081							
R Square	0.236400243							
Adjusted R Square	0.204583586							
Standard Error	4261.20085							
Observations	26							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	134914114.8	1.35E+08	7.430078093	0.011786678			
Residual	24	435787984.4	18157833					
Total	25	570702099.2						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 90.0%</i>	<i>Upper 90.0%</i>
Intercept	-16965.49723	8379.339915	-2.024682	0.054163996	-34259.60483	328.6103674	-31301.55973	-2629.434729
X Variable 1	0.117959426	0.043274889	2.725817	0.011786678	0.028644445	0.207274407	0.043921194	0.191997658

Appendix B: The value of Θ_1 and Θ and the scale of informal finance and private lending in China from 1993-2018

The following picture shows the Shanghai's Θ_1 , China's Θ , the scale of informal finance and the scale of private lending.

Picture 2: the value of Θ_1 and Θ and the scale of informal finance and private lending

		China																											
Year		2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993		
GDPI (hundred million)		300309.9	300791	340056	480991	641281	892963	1184301	1679460	2311101	3148116	4211101	5485116	7029201	9104330	11771101	15110101	1927201	2431101	3000101	3600101	4200101	4800101	5400101	6000101	6600101	7200101	7800101	
Short-term Credit (SC)		332461.04	330339	330645.8	315963	283670	280369	248273	209133	160233	146616	121183	114478	88099.9	84799.9	46836.8	83661.2	78247.9	67327.2	65748.1	43887.6	60613.2	56416.3	48216	33372	20948.7	21970.6		
Foreign Direct Investment (FDI)		8931.2401	8847.22	8369.36	7864.41	7344.45	7282.34	7052.07	7339.32	7197.73	6150.35	6416.93	5685.91	5247.12	4841.64	5018.22	4428.61	4365.64	3880.09	3370.55	3337.73	3763.93	3391.71	3462.18	3333.88	2912.28	1585.41		
Securities Market Financing (SMF)		1208.35	15691.8	1633.56	1578.29	668.89	0	1034.32	2824.43	4882.59	1878.98	1034.38	4770.81	1341.7	57.63	361.05	472.42	498.75	614.03	852.65	494.2	404.14	613.97	211.68	219	143.23	143.5		
The sum		173479.83	364868	340056	320347	351683	387051	503353	712496	1087201	154640	192633	249521	305098	397784	52316.1	88562.2	76112.2	71821.8	69900.7	67710.5	64781.2	59764	43889.9	36277.2	30007.2	23699.5		
Θ		0.435	0.432	0.460	0.674	0.495	0.485	0.470	0.438	0.631	0.444	0.415	0.463	0.478	0.676	0.370	0.641	0.600	0.648	0.698	0.748	0.760	0.705	0.611	0.591	0.617	0.648		
		Shanghai																											
Year		2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993		
GDPI (hundred million)		41679.87	38631	38178.7	35133.1	31667.7	21818.2	20181	18195.7	17160	15047	14069.8	13189	10166.6	8164	8077.83	6684.31	541.01	5210.13	4771.11	4188.7	3801.03	3118.76	2957.55	2499.41	1960.86	1619.31		
Short-term Credit		15557.72	15226.2	13303.4	12961.9	9622.38	8663.9	9037.27	7876.17	6718.61	6223.29	6347.12	5691.46	4674.67	4728.63	4880.22	5052.02	4714.34	4139.39	4343.1	3726.46	3327.96	3071.43	2141.28	1773.36	1443.7	1125.35		
Foreign Direct Investment		1148.8023	1148.35	1233.83	1149.7	1111.9	1039.22	918.553	818.914	752.836	719.851	705.344	602.237	566.564	561.131	541.385	484.205	416.333	613.326	445.289	496.015	398.721	0	382.079	371.468	343.8	131.541		
Securities Market Financing		83.19	156.71	194.09	647.9	842.58	0	31.451	40.442	148.266	158.715	29.4460	2.072	12.8078	0	0.78	0.96	0.7436	1.08	0.986	1	1.3	43.1558	12.8078	0	0	47.0986		
The sum		1785.72	16531	14731.3	14756.4	10822.5	10703.1	10027	8735.53	7619.7	7101.86	7076.61	6295.97	5254.03	4289.7	4432.39	5537.18	431.47	470.68	4796.3	4234.08	3727.98	3114.99	2566.17	2044.30	1787.5	1305.95		
Θ_1		0.513641	0.53905	0.52278	0.58748	0.45921	0.49050	0.49085	0.45508	0.44388	0.472	0.50298	0.51654	0.50683	0.57721	0.67168	0.82716	0.89381	0.91242	1.00403	1.00844	0.98077	0.90572	0.8609	0.81809	0.89785	0.85964		
		The scale of private finance																											
Year		2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993		
Domestic financial transaction ca		1077950	950508	731160	591661	539423	517060	454004	381272	430416	332891	235310	20180	174525	133792	110312	106511	73868.9	48791.7	44618.5	41169.3	37550.3	46105	52115.5	36401.7	35902.9	24341.9		
Domestic financial transaction fu		172449.8	189429	155173	143293	142212	140308	121940	97009	87226.6	107875	54112	40978	33452	34307.8	25239.6	28506.4	19916.6	11643.3	11303.2	10973	11104.9	12962.4	15130.6	9946.4	9174.66	7573.55		
The sum		1459979.8	149927	131103	120110	126368	127136	108881	95444.4	87238	63444.5	37238	31245	29998	17788	13918	13564	12388	12678	10960	13888	12130	12663	12678	12800	12603	12730	12505.4	
(hundred million) (The ratio * The scale of private finance)		14231.163	17548.7	9854.9	18808.1	738.064	877.266	3017.31	2176.49	1052.57	3196.56	6425.5	3596.37	1173.17	4704.64	3772.78	6719.73	8002.51	6999.57	7780.55	6292.64	5552.59	3486.12	5206.67	3730.94	3492.51	2354.2		

Picture 3: the number of formal financial institutions and the scale of private lending in China from 1993-2018

	A	B	C
1			
2	Year	the scale of private lending (hundred million RMB)	the number of financial institutions in China
3	2018	14231.16267	226111
4	2017	17548.71	222571
5	2016	9854.895	225347
6	2015	18808.1	220727
7	2014	738.0637	214069
8	2013	877.2662	208923
9	2012	3017.307	202128
10	2011	2176.492	200450
11	2010	1052.568	194727
12	2009	3196.558	188830
13	2008	6425.502	187479
14	2007	2595.271	194578
15	2006	1173.172	193476
16	2005	4704.637	203743
17	2004	3772.778	195117
18	2003	6719.726	191205
19	2002	8002.514	188609
20	2001	6999.571	186240
21	2000	7780.547	182791
22	1999	6292.642	180720
23	1998	5552.588	178868
24	1997	3486.116	175390
25	1996	5206.675	170580
26	1995	3730.938	164876
27	1994	3492.515	158973
28	1993	2354.204	152766