Blockchain Technology Mitigates the Role of Information Asymmetry

-- Take P2P Online Lending Platforms as an Example

Danni Guan[1,a,*]

[1]*University of International Business and Economics, School of Information, Beijing,100029,China*
a. 605293184@qq.com
*corresponding author

Abstract: With the rise of online finance, P2P online lending platforms based on new lending methods have ushered in an era of rapid development, attracting the attention and research of scholars. This paper uses platform data comes from the home of online loans, the National Bureau of Statistics of the People's Republic of China, and the Wind database, and takes P2P online loan platform as an example to study its impact on information asymmetry. Empirical analysis shows that P2P online lending can alleviate information asymmetry and improve information transparency, and the robustness test verifies the results of benchmark regression. Finally, this article also makes some specific recommendations for enhancing the P2P online loan platform based on the findings of the investigation such as the use of blockchain technology to establish a regulatory system and improve information transparency.

Keywords: blockchain technology, information asymmetry, P2P online loans, empirical analysis

1.   Introduction

P2P lending is a hot topic in recent years, originated in the UK, and is a "Person-to-person" internet-based way of lending to achieve. "Pai Pai Loan" company was established in 2007 in Shanghai, which is the P2P network lending in the Chinese market on the formal emergence of the symbol. In China, due to the active private capital and the development of network technology, the P2P network lending business is growing rapidly. By the end of 2015, there were more than 4,900 P2P platforms in China [1]. However, the problem of P2P online lending has become increasingly serious because of problems such as an imperfect credit Information asymmetry system and weak supervision and self-discipline, more than 1,100 problematic platforms were identified in 2015 alone [2], seriously hurting the interests of investors. In order to protect the security of the P2P lending sector and investors' money, it is crucial to address the information asymmetry problem in P2P lending.

The monitoring measures have not yet been released because the current market's entry and exit procedure is not ideal, the credit record system is not perfect and so on, P2P platform often has certain information superiority, the resulting moral hazard problems also exist, such as the illegal establishment of capital pools, term mismatch, and even malicious default. As a new industry, the P2P network lending industry has great development potential. P2P platforms have the potential to improve upon the flaws of the conventional financial system while simultaneously promoting the

transformation of traditional institutions. P2P lending platforms can also give small and medium-sized businesses new options to lend and offer small loans for consumer use. Researching the impact of P2P on information asymmetry is therefore extremely important. The essay makes full use of platform data to study the impact of P2P lending platforms on Information asymmetry and try to suggest improvements.

2. Literature Review

Despite the fact that information disclosure systems are crucial for reducing information asymmetry, and the extensive application of two-sided market theory and Internet technology is also considered to be the key to solving the problem of lack of trust between strangers, so far, it is generally believed that there is still serious information asymmetry in the P2P market, which is manifested in that borrowers have more information resources. This leads to more default information [3]. Many studies have been done by academics both domestically and overseas, explaining the information asymmetry between lending and lending in P2P network lending platforms by primarily applying game theory and econometric models. There are two main factors that account for the poor selection of P2P network loans. Firstly, trust will decline due to online user interactions being anonymous. Secondly, due to the existence of opportunism, borrowers may have a tendency to self-glorify in order to increase credit. Ai Jendi also believed that borrowers would fabricate false information in order to beautify themselves, thus exacerbating the asymmetry of information [4].

Lv Wen summarized some problems existing in the growth of the P2P online lending business and analyzed four aspects of its application in P2P online lending from a technical perspective, including establishing a trust system, ensuring platform security, improving information transparency, and solving regulatory problems [5]. Wang Shubin studied the data before and after Renrendai was connected to the social credit investigation system and found that after Renrendai was connected to the social credit investigation system, the bad debt rate and the trading volume of the platform changed significantly, and the social credit investigation system had a significant effect on improving the risk management level of P2P online lending platforms [6]. Ye Dezhu explored the interest rate changes of Chinese P2P platforms from a macro perspective and found that the interest rate of online lending platforms is counter-cyclical and the barre effect has little influence on it by studying the daily interest rate changes in three years [7]. Hu Zhen et al. argued that borrowers would "learn while doing" when making loans on P2P platforms, so as to improve their ability to judge their credit quality and gradually correct their misjudgments [8].

3. P2P Lending Platform

3.1. Overview of P2P Lending Platform

The result of combining the Internet and credit lending is P2P online lending. Both lenders and borrowers rely on the Internet to realize the borrowing process from individual to individual through a P2P lending platform [9]. Its appearance opens up a new situation in addition to the traditional way of lending but also brings great convenience to people's life and the development of small, medium, and micro enterprises. Compared with traditional bank lending, P2P platforms are favored by many Internet users because of their advantages such as lower investment threshold, faster qualification review, and faster lending speed. China's first P2P online lending platform, PpDai, was created in 2007. There were 26 P2P lending websites in China by 2010. In 2011, China's P2P online lending platforms entered a time of rapid expansion, and in 2014, they started a period of rapid expansion, adding an average of 1-2 new platforms daily. However, the P2P online lending industry has no entry threshold, no operation norms, and no regulatory standards, which makes the P2P online lending sector's explosive growth, but also exposed a lot of problems, a number of platforms in charge of

running away, raising capital pools, Ponzi schemes and other phenomena, which bring great harm to platform users.

According to statistics, 1,031 P2P online lending platforms had problems in 2015, 30% of China's P2P internet lending platforms are in this category. [10]. Since then, the state's pertinent departments have started to place a high priority on managing the P2P lending market, and they've even released a draft set of interim regulations called the Interim Measures for the Management of Business Activities of Online Lending Information Intermediaries (Draft for Comments). In 2018, the frequent explosion of P2P platforms occurred, and the relevant departments began to focus on the rectification of the P2P lending industry, proposing that "most institutions should be promoted to withdraw from the P2P lending industry. The policy of guiding some institutions to transform resulted in a 46.24% drop in the turnover of the domestic online lending industry in 2019 compared with that of 2018 [10].

3.2. Problems Existing in P2P Lending Platforms

In the conventional loan market, banks use collateral or borrowers' provided collateral to address the issue of information asymmetry [11]. However, in the P2P lending industry, most customers are small and micro enterprises and low-income people, who are often unable to provide collateral. Therefore, P2P online lending usually evaluates whether lending transactions can be conducted by examining relevant information provided by users. Due to the particularity of anonymity of Internet users, P2P platforms and lenders may hide information in the process of providing information, and both parties may obtain different amounts of information or have different understandings of information, which will result in information asymmetry between transaction parties.

Information asymmetry can be divided into two situations: information asymmetry between investors and P2P platforms and information asymmetry between lenders and borrowers. From the perspective of investors and P2P platforms, when investors choose to invest from various P2P platforms, they tend to choose platforms with higher interest rates due to profit-driven investors. In order to attract more investors, P2P platforms will raise interest rates, resulting in the phenomenon of falsely high-interest rates in the P2P online lending industry. High returns also mean high risks. As a result, some pllow-interest low interest rates rarely attract investors, and in serious cases, high-quality platforms with low-interest rates are crowded out of the P2P lending market. There are two main reasons for this phenomenon of bad competition. On the one hand, the P2P lending industry depends on technological innovations in the Internet, and the virtual nature of the Internet makes it impossible for investors to get accurate information when searching for all aspects of the platform information. On the other hand, in order to attract more investors, the platform itself often chooses to beautify its own image, and even exaggerates the publicity and covers up the real operating conditions, thus increasing the information asymmetry between the platform and investors. P2P online lending platforms, which act as information mediators for investors and borrowers, are typically audited based on the data provided by borrowers and then classified into various credit ratings. If investors want to know the personal information, credit status, and loan purpose of the borrowers, they can only use the information provided to the platform by the borrowers themselves.In this process, if a borrower provides false information and fabricates his or her occupation and salary status, the platform cannot verify the borrower's information on the spot due to the restriction of Internet technology, so the accuracy of the borrower's information cannot be fully guaranteed.

4.   Empirical Analysis

4.1.   Sample Selection and Data Sources

In 31 provinces and cities, P2P loan platforms provided the data for this study. The data of P2P loan platform transaction volume comes from the home of online loans, and the other data mainly comes from the National Bureau of Statistics of the People's Republic of China and the Wind database. [10]

Table 1: Variables and definitions.

Variable type	Variable name	Variable symbol	Variable definition
Explained variable	Information asymmetry	Lnxxtmd	Information transparency index
Explanatory variable	The transaction volume of P2P lending platform	P2Ptrade	The transaction volume of P2P lending platform
	P2P loan balance	on loan	P2P loan balance
Control variable	Economic aggregate	GDP	The total economic aggregate of each region is the logarithm
	Innovation level	lninnov	The number of annual patent applications in each region is logarithmic
	Degree of marketization	Market	Marketization degree index

4.2.   Data Processing Procedure

4.2.1.Descriptive Statistics

Table 2: Descriptive statistical analysis.

Variables	Observed number	Mean value	Standard deviation	Minimum value	Maximum value
Lnxxtmd	94	53.96489	11.62321	26.98	69.38
P2Ptrade	94	11.82394	28.92017	0.02	193
lnloan	94	3.150142	1.625673	1.10194	7.566828
lnGDP	94	10.81363	0.482281	9.63908	11.51238
lninnov	94	12.64839	0.68603	10.70342	13.58461
Market	94	10.01872	0.873211	5.02	10.62

4.2.2.Correlation Analysis

In order to prevent the reliability of the regression findings from being compromised by the empirical bias brought on by high levels of correlation between variables. Prior to the model's empirical regression, a correlation analysis of the main variables was performed to prevent Multicollinearity

between the variables. Table 3 below displays the results. Additionally, P2P lending and information transparency have a favorable link, according to the correlation data.

Table 3: Correlation analysis.

Variables	(1)	(2)	(3)	(4)	(5)
(1) Lnxxtmd	1.000				
(2) P2Ptrade	0.030	1.000			
(3) lnGDP	0.502	0.021	1.000		
(4) lninnov	0.669	0.038	0.944	1.000	
(5) Market	0.451	0.039	0.530	0.629	1.000

4.2.3. Baseline Regression Analysis

Stata15.0 software is used to realize the influence of P2P network lending on information asymmetry. Table 4 shows the regression results after adding control variables. After the introduction of control variables, the average VIF value of the variance expansion coefficient detected by Stata is 6.07, lower than the critical value of 10. There is no multicollinearity problem between variables, so the regression results have a certain robustness. The regression result is significantly positive, indicating that P2P online lending can alleviate information asymmetry and improve information transparency, which verifies the hypothesis mentioned above.

Table 4: Baseline regression analysis.

	(1)
	Lnxxtmd
P2Ptrade	0.0102***
	(3.5226)
GDP	38.7500***
	(9.0243)
lninnov	-16.7480***
	(-5.0843)
Market	2.9277***
	(2.9103)
_cons	-1.8e+02***
	(-11.4125)
N	94
R2	0.712

t statistics in parentheses* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.3. Robustness Test

4.3.1. Substitution Variable

By replacing explanatory variables with the balance of P2P loans, the following regression results are obtained. Despite being insignificant, the regression results are in line with the direction of the baseline regression, indicating that the benchmark regression results have a certain robustness.

Table 5: Alternate variable regression.

	(1)
	Lnxxtmd
on loan	0.1883
	(0.4478)
GDP	38.3809***
	(8.8455)
lninnov	-16.5940***
	(-5.0335)
Market	2.9610***
	(2.9373)
_cons	-1.8e+02***
	(-10.7169)
N	94
R2	0.712

4.3.2. Quantile Test

P2P network lending has grown in popularity, the behavior of information asymmetry may differ significantly. In this regard, quantile regression was further conducted. After 500 Bootstrap tests, the quantile regression diagram was shown in Figure 1 below. The test results show that P2P network lending has different effects on information asymmetry in different positions of the conditional distribution.
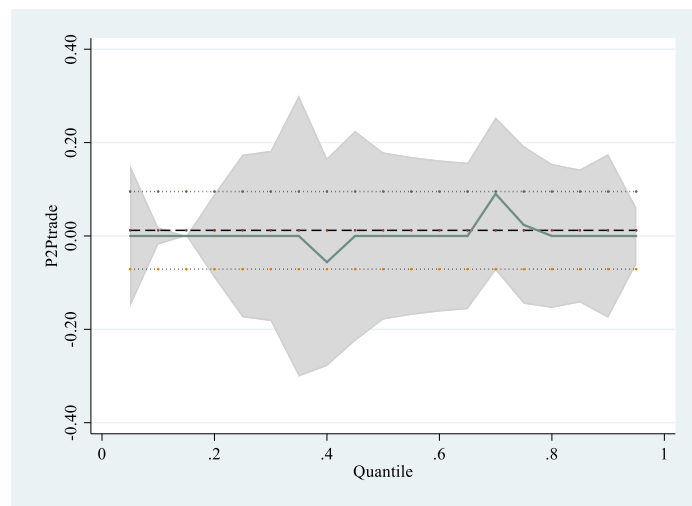

Figure 1: Quantile regression.

4.4. Results

This research examines the impact of information asymmetry using the P2P network lending platform as a prime instance based on platform data. The empirical analysis shows that P2P lending can alleviate information asymmetry and improve information transparency. The robustness test verifies the results of benchmark regression.

5.   Discussion

The following recommendations are made in light of the research conducted for this article and the growing state of P2P online lending in China.

The creation of a regulatory holographic cloud using blockchain technology comes first. Blockchain is a decentralized, tamper-proof, traceable, and multi-dimensional distributed database with features of multi-dimensional maintainability, self-contained time scale of data, and synchronous update of data.

Second, P2P platforms should strengthen information disclosure and improve transparency. P2P online lending platforms should make real disclosure of their basic conditions and operating conditions on a regular or real-time basis, which cannot only rely on the self-discipline and consciousness of P2P platforms but also need the government's mandatory measures. In the past, the state required P2P platforms to disclose information, including platform information, borrower information and cooperative institutions information, including the basic and operating conditions of the platform, borrowers and loans, third-party institutions and traditional financial institutions' real information.

Third, investors should analyze the qualifications of P2P lending platforms from multiple perspectives. Investors should choose large platforms and popular investment platforms as far as possible for investment. For example, Wangdaizhijia is a platform specifically for information disclosure of P2P online lending platforms. The ranking, volume of transactions, and popularity of all platforms will be published on the website, and investors are advised to choose the top 20 platforms for financial management.

6.   Conclusion

This paper starts from the P2P lending platform and introduces blockchain technology to solve the problem of information asymmetry in the P2P lending industry, so as to encourage the P2P lending sector's healthy growth. This paper expounds on the concept of a P2P network lending platform, analyzes the influence of information asymmetry on P2P network lending industry, points out the problems existing in the current P2P network lending industry, and empirically analyzes that P2P network lending can alleviate information asymmetry through blockchain technology, and explains the role of blockchain technology applied to P2P network lending industry. The research content of this paper still needs to be improved. First of all, the data collection is not comprehensive enough, which may lead to some errors in the results. Secondly, the understanding of P2P online lending platforms is not deep enough, so we can continue to deepen the understanding in the future. Future advancements in blockchain technology can enhance safeguards of P2P online lending platforms while promoting transparency and automation in the regulation of the P2P online lending sector.

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