A Study on the Financial Risk and Legal Supervision of P2P Lending Model in the Context of Internet Finance

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Abstract

In China, peer-to-peer lending (P2P lending) adopts a large number of offline credit checking models based on manual due diligence. Compared with the traditional financial industry, the comparative advantage of Internet finance can not be achieved. The important cause for the rapid development of P2P lending in China lies in the "financial disintermediation". Admission restrictions have led to high profits in China's financial industry. While P2P lending conducts business similar to commercial banks in a "regulatory arbitrage" and thereby gets relatively high profits. In this context, China's P2P lending model is of typical Chinese characteristics, and the risks involved are more complex. In this paper, the author aims to solve the financial risks in the P2P lending model in the context of current Internet finance and promote strengthening legal supervision over it. Firstly, the definition and common mode of P2P lending are summarized. Relevant financial risks are analyzed and effective legal supervision measures are put forward. On the basis of this, aiming at the financial risk of P2P lending, the risk control model is constructed in order to effectively reduce the risk of P2P lending and create a stable environment for P2P lending.

Keywords: P2P Lending Model, Financial Risk, Legal Supervision, Risk Model.

1. BACKGROUND

1.1 Literature review

P2P lending is peer-to-peer lending directly realized based on the Internet platform, the lending and borrowing process of which needs no involvement of financial intermediaries. In foreign countries, the rise of P2P lending stems from the maturity of credit information system and the progress in Internet technology. The maturity of the credit information system makes it possible for pure online borrower credit audit and loan interest rate determination. The progress in Internet technology has reduced the cost of information transmission and realized automated credit approval as well as supply and demand matching. Since the rapid development of P2P lending in China in 2013, there have been frequent platform risk events (Zhou, 2016). Especially after entering the second half of 2015, the number of platforms with problem have risen dramatically. According to the data from data.01caijing.com, from 2013 to April 2016, there were at least 218 platforms that were closed down for rectification, or with difficulty in cash withdrawal, runs on deposits, bankruptcy and even runaway. The number of platforms with problems reached 26% of the total, equivalent to 1 out of every 6 platforms has a risk event. From the end of 2015 to the beginning of 2016, there was a massive explosion of risk events in P2P lending in China. Among them, in October 2014, the number of newly added issue platforms was 28; in November 2014, the number of newly added issue platforms reached 45, which means that on average, there is a daily risk event on one platform. Although P2P lending has been in China for 7 years, no substantive regulatory system has yet been formed and regulation is in the form of restriction by some laws related to this (Fu, 2016). However, the existing laws and regulations can not effectively address the special business model of P2P lending, resulting in a large number of platforms at the edge of the law. However, P2P lending has obvious financial attributes and high externalities. If left unregulated, it may have adverse social impacts.

1.2 Research objectives

As China’s P2P lending risk events occur frequently, the regulatory authorities have issued some regulatory rules. In December 2014, the Payment & Clearing Association of China, under the guidance of the People’s Bank of China, established the Internet Finance Committee and formulated the industry standards and conventions. In
2015, the State Council made clear that the CBRC (China Banking Regulatory Commission) is the regulator of P2P lending in China. CBRC publicized the “4 red lines” that P2P lending platforms must follow (Yang, 2014). Since 2015, CBRC has held a number of relevant discussions, which have given great importance to P2P lending. Zhang Xiaopu from Bureau for Policy Analysis of CBRC puts forward 12 principles of Internet financial regulation. In this paper, the author discusses the generation logic of China’s P2P lending, analyzes the potential risk points and puts forward the corresponding regulatory measures, which aims to provide a reference for the regulatory authorities to make policies.

2. AN OVERVIEW OF P2P LENDING MODEL IN THE CONTEXT OF INTERNET FINANCE

2.1 The concept of P2P lending

The P2P lending model, developed in the context of the Internet finance, is a typical Internet platform model used in the financial field and mainly refers to the direct lending between individuals through the Internet platform. Compared with the traditional financial lending model, the core content of P2P lending is that the information processing and risk assessment are conducted through network. Meanwhile, the term and quantity of capital supply and demand are matched without any intermediaries such as banks or broker and the supply and demand parties can make a deal directly. The P2P lending model to some extent effectively solves the problems of small and micro-enterprises and individual business in getting loans, and can save the operating costs of financial intermediaries such as commercial banks. It is considered by the mainstream as a typical representative of “disintermediation” in Internet finance and also a beneficial complement to the bank.

2.2 P2P lending model

There are mainly 3 kinds of P2P lending model in China. Firstly, the platform model, which is mainly based on foreign business model and also the most pure P2P model. In this model, platforms are not engaged in guarantee, but simply match the information, helping both borrowers and lenders to make better fund matching. The essence is direct financing, and the most representative one is ppdai.com. Secondly, the guarantee model - P2P platforms provide investors with guarantees of principal or even interest, and investor's investment decision is also shifted from the basis of their own ability and borrower information disclosure to the trust in P2P companies. At present, most P2P companies in China adopt this business model (Song and Zou, 2014). Thirdly, the agency model represented by lu.com, yooli.com, etc. which sells the credit assets of financial institutions or quasi-financial institutions to investors through the Internet platform in a more flexible manner. The common P2P lending models are as shown in Figure 1.

![Figure 1. P2P Lending Conventional Model](image)

3. FINANCIAL RISKS OF P2P LENDING MODEL IN THE CONTEXT OF INTERNET FINANCE

3.1 Information asymmetry causes moral hazard

Finance is an industry based on trust, and moral hazard is a typical risk of violating trust mechanism. Because the trading mechanism of P2P lending is built through platforms, and companies which own such platforms can alter...
all kinds of data in backstage records, even make up and fabricate some data (Li and Jin, 2014). At P2P platforms, credit loans are between strangers and the transaction data and credit approval rights are under the control of platforms, investors have no way to effectively review such transaction information and can not judge or track the authenticity of actual use of their funds, thus are in a disadvantageous position.

### 3.2 Inadequate platform management and risk control

In China, many P2P lending platforms have low access threshold, low capital requirements, and the management teams' abilities to control risk are far apart. Due to lack of experience, some platforms are with unreasonable trading mechanism design, often cannot effectively identify potential risks at the beginning of the business process. The expected rates of return on investment are too high, and due to the split of the rights of creditor and term mismatch, liquidity risk increases. When borrowers are difficult to maintain performance and cannot make repayment on time, it could lead fund chain breaks of platforms, causing negative news and leading to a run on deposits. The continued economic instability in financial markets in 2016 has a huge capital withdrawal effect on P2P lending platforms. In particular, the borrowers with irrational debt structure have financial strains. Overdue and roll-overs eventually lead to runaway and shutdown many small and medium-sized platforms due to runs on deposits. P2P platforms with problems caused by difficulties in cash withdrawal accounted for 39% of the total, increased compared with that in 2015 (Guo and Li, 2014). Figure 2 below shows a typical multi-platform self-financing and self-guarantee operation model, in which there is an extremely serious potential financial risk.

![Figure 2. Multi Platform Self-financing and Self-guarantee Operation Mode](image_url)

### 3.3 The current credit information system is not good enough

As China's credit information system for P2P lending model is not good enough, there is no complete information disclosure system, which lacks public information and has a limited coverage of groups of individuals. The individual credit information collection, assessment and tracking mainly follow the traditional offline credit information reporting model, that is, depending on offline team or external cooperation agencies, and a lot of manpower and time are put in to collect, review and assess borrowers' credit information. However, due to the fact that the Internet model has broken the restrictions of regional lending, the traditional credit information reporting model can hardly meet the demand for credit information collection of the current debtor-creditor relationship and at the same time generates high credit reference costs (Yuan, 2014). Moreover, although the data of the PBC Credit Reference Centre cover 800 million people, only 290 million actually have records and 500 million have no credit records at all. The credit record data include only two categories: one is the basic personal information, and the other is credit card payment and repayment records. For some P2P lending platforms that have been connected and shared with the credit information system of the PBC Credit Reference Center, the data used to determine borrowers' credit include 44 categories of information such as mobile phone number, personal income certificate, social security information, family members information, driver's license information and so on. Apparently, the credit reference data from the PBC are too simple to play a vital role (Wan, 2015). Therefore, the data obtained by the P2P lending platforms will lead to serious information asymmetry and can not meet the demand of risk judgment. It affects not only the loan efficiency but also the loan quality, and directly leads to the lack of information exchange among different regions and platforms. What most commonly occurs is "multiple lending to the same person", "to rob Peter to pay Paul" and other undesirable phenomena, which further increases the liquidity risk and credit risk of the platforms, and such a vicious spiral will increase P2P lending platforms' bad debt rate and eventually leads to runaway and shutdown.
4. LEGAL SUPERVISION MEASURES OF FINANCIAL RISKS IN P2P LENDING MODEL IN THE CONTEXT OF INTERNET FINANCE

4.1 Create a professional team and enhance level of risk control

A P2P platform trusted by investors must have an efficient, high-quality and professional team. High-quality professionals do not only have financial expertise and improve business efficiency, but also reduce the moral hazard to a certain extent because their earnest attitude and responsibility to work (Zhou and Gan, 2015). It is also necessary to establish a comprehensive and practical trading mechanism. The general trading mechanism includes: audit of borrower's information authenticity, loan cycle limit, interest rate system, risk bearing capacity, compensation system, historical credit and so on. Figure 3 shows the details of the current legal supervision model and departmental responsibilities in China.

![Figure 3. China's Current Financial Legal Supervision Model](image)

A good trading mechanism is the ability of P2P platforms to attract investors. The supervisor should have a systematic and thorough understanding of the related business in charge and develop a good communication and feedback mechanism for downward extension. On this basis, regularly assess and compare the administrative efficiency and make continuous improvements. Secondly, when delivering and disseminating various administrative tasks, the integrated management department should improve the administrative efficiency by formulating appropriate workflows for different positions and nature of work (Zhang, 2017). Finally, the administrative work between departments should be formulated for the internal administrative processes and administrative work scope, to avoid inefficiency caused by unclear responsibilities.

4.2 Actively innovate, improve and strengthen various systems

Financial services and the financial system are operated under the institutional framework. In addition to adjusting to market changes, the innovative banking system can also improve administrative efficiency. Under the existing system, the financial market system and the financial organization system should be gradually improved, the interest rate liberalization will be realized eventually to keep pace with the economic and financial globalization, so as to promote the sustainable development of commercial banks. Banks should improve their management efficiency by coordinating internal resources and innovating financial products effectively (Wang, 2017). Financial innovation is an important way to promote the development and efficiency of commercial banks. Figure 4 shows the reform of China's P2P lending financial risk supervision system.

![Figure 4. Financial Style Legal Supervision Reform System](image)
Innovation in financial system, institution and technology constitutes the main contents of financial innovation. Moreover, the new mode of operation and management will increase the assets and profits of financial institutions, which will help improve the quality of financial products and services (Du and Liu, 2017). In the new institutional system, the promotion of financial instruments, transactions, technologies and services will increase the ability of commercial banks to accumulate funds and thus increase their assets. Financial innovation helps commercial banks improve their efficiency and ability to deal with challenges.

5. MODEL OF FINANCIAL RISK CONTROL OF P2P LENDING IN THE CONTEXT OF INTERNET FINANCE

5.1 Concept of information entropy measurement method

Although the understanding of the meaning of risk varies, it is generally accepted in finance that risk is linked to the uncertainty of loss, that is, the uncertainty of future returns due to market changes or uncertain future events. Whether it concerns loss or return, risk presents an uncertainty, which is the nature of risk and coincides with the nature of entropy, but risk is not equivalent to uncertainty. Therefore, the measurement of risk is based on a decision maker to analyze the uncertainty of risk and the losses and returns it causes (Wang and Li, 2017). In fact, there is an inseparable relationship among the uncertainty of risk, loss and return. The uncertainty leads to the loss and return of an event. However, different losses and returns show the uncertainty of risk. Although loss and return are twins, their contribution to risk is not balanced, so they are relevant but have no complete reciprocity. Based on the understanding and analysis of risk, we believe that the method of measurement analysis should reflect the uncertainty, subject, amount of loss of risk and the expected return. The information entropy function is a measurement tool that effectively ties these aspects together.

5.2 Detailed calculation steps

5.2.1 Mathematical formula of information entropy

For a discrete random variable $X$, $p_1, p_2, ..., p_n$ is the probability with $n$ possible outcomes $x_1, x_2, ..., x_n$, where $0 \leq p_i \leq 1, (i = 1, 2, ..., n)$ $\sum_{i=1}^{n} p_i = 1$, then the information entropy of discrete probability event $x$ is

$$H = -k \sum_{i=1}^{n} p_i \ln p_i$$

(1)

Where $k$ is a normal number that depends on the unit of measure and it is defined that $0 \ln 0 = 0$.

For a continuous random variable $X$, its probability density is $f(x)$, then the information entropy of $X$ is:

$$H = - \int f(x) \ln[f(x)]dx$$

(2)

5.2.2 Comparison between entropy and variance

In fact, it is natural to think of variance when talking about risk, because changes of loss and gain in risk are random variables and variance is most commonly used in the statistical description of a random variable index of characteristic (Wang, 2013). So let's start with the formula for entropy and variance and use a simple way to verify the similarities and differences between information entropy as a measure of risk and variance.

When the risk variable $X= \{x_1, x_2, ..., x_n\}$ is a discrete variable, let the distribution law of $X$ be $\{p_i\}$, where $p_i = P(X = x_i) (i = 1, 2, ..., n)$. The variance of variable $X$ is:

$$D(X) = E[(X - E(X))^2] = \sum_{i=1}^{n} p_i (x_i - E(X))^2 = \sum_{i=1}^{n} p_i [x_i^2 - 2x_i E(X) + E^2(X)]$$

(3)

Where $E(X)$ is the mean value of the random variable $X$. Then the entropy of variable $X$ is:

$$H(X) = - \sum_{i=1}^{n} p_i \ln p_i = \sum_{i=1}^{n} p_i (- \ln p_i)$$

$$= - \sum_{i=1}^{n} p_i [-(p_1 - 1)] + \frac{(p_1 - 1)^2}{2} + \frac{(p_1 - 1)^2}{3} + \cdots + \frac{(-1)^n (p_1 - 1)^n}{n} - R_n(p_1 - 1)$$

(4)
Where \( R_n(\cdot) \) is Lagrange remainder.

For the risk event \( x \), the corresponding distribution of returns is, the conventional variance measure only reflects the risk status with the mean as the reference point, but the specific situation of these risks in the financial system can not be determined, that is, what risk position should there be in the financial system where this risk is in is absent, while information entropy can be used to measured the risk event as a whole. Therefore, the information entropy can be regarded as a useful supplement to the variance method. We propose the following information entropy-standard deviation model:

\[
R(X) = \lambda X + (1 - \lambda) S_X(\theta)
\]

(5)

The following is a detailed analysis of the model. (1) Translation invariance: \( \forall a \in R, r \) is a risk-free interest rate, then \( R(X + ar) = R(X) \) proves \( S_X(\theta) = S_{X + ar}(\theta) \), according to which it can derived that:

\[
R(X) = \lambda X + (1 - \lambda) S_X(\theta)
\]

(6)

\[
R(X + ar) = \lambda X + ar + (1 - \lambda) S_X(\theta)
\]

(7)

For the risk \( X \) and \( X + ar, H_x(\theta) = H_x + ar(\theta) \), therefore, \( R(X + ar) = R(X) \).

This fully shows that the model does not increase financial risk in the process of increasing cash flow. (2) Positive homogeneity: \( \forall h \geq 1 \) then \( R(hX) \leq hR(X) \), which proves that

\[
S_{hx}(\theta) = h S_x(\theta), hR(X) = h \lambda X + h(1 - \lambda) S_X(\theta)
\]

(8)

\[
R(hX) = \lambda hX + (1 - \lambda) S_{hx}(\theta) = \lambda hX + h(1 - \lambda) S_X(\theta) \leq h \lambda X + h(1 - \lambda) S_X(\theta)
\]

(9)

For the risk \( X \) and \( hX, H_x(\theta) = H_x(\theta) \), then \( R(hX) \leq hR(X) \), the model shows that as the asset allocation increases, the risk also increases, and the risk of zero assets is still zero.

5. CONCLUSIONS

According to the analysis of financial risk in P2P lending mode and legal regulation in the context of Internet finance, it can be fully concluded that it still needs to have designated regulatory authorities to supervise P2P lending. It is suggested that the central government, the People's Bank of China, the Payment & Clearing Association and the Internet Finance Committee, taking the characteristics of the Internet into consideration, take the objective value of financial regulation in general as the principle, establish the minimum standard conditions from the aspects of registered capital, enterprise organizational structure, professionals, funding escrow and information disclosure, make clear the scope of business and risk control requirements and then give local governments the right to enforce. At the same time, the P2P lending industry self-regulation association should strictly formulate codes of practice combining the progress in the development of the industry, e.g. blocking misleading ads such as "principal and returns guaranteed", and let investors be aware of the risk of P2P lending itself and jointly build a regulatory system for the healthy development the Internet finance.

REFERENCES


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