

Risk Identification and Monitoring Model of Online P2P Lending

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Abstract—The fast-growing of P2P network lending has also brought many threats to the users. Risk identification plays an important role in the supervision of P2P net loan. So the effective risk identification of P2P network lending is very important to the network financial management. The risk assessment model can help to make management strategy, identify the crime clues, and prevent some crime. Through the research and analysis of the main roles of P2P net loan, we considered that the risk is from borrowers, lenders, Online P2P lending platform and related regulatory agencies. We analyzed the risk characteristics of various entities in P2P operation, and set up the framework of risk identification model from two aspects of the borrowers and debits in P2P, regulators and P2P platform, which are conducive to the operation and supervision of P2P net loan.

Keywords—P2P net loan, P2P lending site, lending regulation, Risk identification, risk evaluation, big data

I. INTRODUCTION

The development of "Internet + financial" has created lots of fund raising mode. The network has a strong attraction for the private capital. Private financing derives new formats, such as P2P net loan, stock ownership, Yu'eobao and so on. Peer to Peer network Lending is a network credit financial model of individual to individual through the network platform. In 2005, the first P2P network loan platform Zopa was established in the UK. Then, a group of P2P net loan platforms, including Prosper and Lending Club, were set up in the United States. P2P network lending industry has gained lots of investors' favors from a relatively high income and convenient investment mode [1]. A large number of funds have been pouring in, but also caused the criminals find many fraud opportunities. As the representative product of the Internet financial industry, the P2P network lending platform is developing rapidly in our country. PaiPai lending is the first P2P platform in China which is set in 2007. As of June 2017, the number of P2P net loan platform in China has reached 5909, but the amount of platform which is still in operation is only 2114. Because of a variety of reasons, more than half of the platforms are closed or run away. Even there is no lack of a large number of platforms runs afoul of the laws, and is subject to legal penalties. Because the P2P network lending involving many people, with a wide geographical area, it has a regulatory vacuum, imperfect credit qualification. The disadvantages leave space for economic crime breeding. The main criminal

behaviors are illegal absorbing public deposits, fraud and other illegal fund-raising crime [2]. The lack of related regulations in the P2P lending platform and the abnormal development in China has caused the frequent risk of illegal public deposits, which has caused many negative effects to China's Internet financial development and financial order. Therefore, the study of Internet finance, P2P network lending platform risk early warning and prevention is of great practical significance to regulators, practitioners, investors or scholars.

II. RELATED WORK

P2P lending site is the financing intermediation that is directly mediated by network lending agencies [3]. The current P2P lending research area is mainly focused on lending efficiency, influence factors and loan risk control. The research on the risk control is the hotspot [4]. The study found that security agencies can provide security for low risk enterprises to reduce the risk of adverse selection [5]; a study on the trading data from the largest P2P net loan platform Prosper, and found that in order to reduce the risk of default, the credit rating information of the borrower can effectively alleviate the information asymmetry between the debit and credit sides [6]. In china, the operation mode and the risk classification of the P2P net loan platform are the two major domestic researchers at present. P2P net loan platform is divided into pure online intermediary, combining online and offline and the third party. Risk is divided into legal risk, credit risk, and operational risk [7]. The study pointed out that P2P lending is lack of credit regulation in China. There is no clear definition of the P2P lending, which increase the risk of P2P network lending [8]. It also pointed out that the illegal fund-raising; fund security and privacy protection are the main security risks in China's P2P network lending platform operation. Some other scholars pointed out that the main risk of our P2P net lending platform are credit risk, legal risk and operational risk [9]. The study puts forward the main risk existing in the current P2P net loan platform has seven kinds, fraud risk, illegal fund-raising risk, misappropriation of funds risk, product risk, high risk borrowers, the alienation of network technology, Risk Spillover risk [10]. At present, the economic crime problems caused by illegal collection of P2P net loan at home and abroad mainly focus on the legal perspective, including the characteristics of illegal fund-raising, the formulation of policies and regulations, and the suggestion of illegal fund-raising. Especially the "risk evaluating" has become a new research hotspot since 2014. It

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shows that the traditional view of scholars is no longer confined to the study of behavior of fund-raising. They hope to develop a new perspective for a new approach to the problem solving [11]. Big data as a means of investigation can effectively solve the real dilemma of the investigation on illegal fund-raising cases. The public security organs can detect and manage enterprise (or individual) illegal fund-raising risk early by using monitoring and early warning function of big data timely.

III. RISK IDENTIFICATION OF ONLINE P2P LENDING

At present, the P2P network in China mainly involves four types of participants in fig. 1: borrowers, lenders, Online P2P lending platform and related regulatory agencies. The risk of each subject in the process of P2P operation is analyzed.

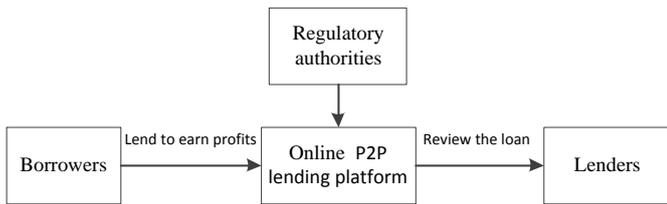


Fig. 1. Participants of online P2P lending.

1) *Lenders*: for the purpose of reducing operation cost, most domestic platforms haven't effectively audited the source of lenders' funds, so the lenders may have a risk of money laundering.

2) *Borrowers*: if they take with a high cost of borrowing, and there is no strict review mechanism, the borrower has the risk of breach of contract.

3) *Regulatory authorities*: P2P network lending platform may also seek "interest asylum" in its fiercely competitive market through "rent seeking" behavior.

4) Online P2P lending platform:

a) *Business operation risk*: the platform set up the "pool of funds" mode to increase the volume of transactions, dismantle the loan items and mismatch the term. Once the operation is bad, it will lead to liquidity difficulty.

b) *Platform fraud risk*: in order to pursue the economic interests, lots of Platform may execute some illegal operation. A vast majority of domestic platform lender's capital transfers through the third party account, management and operation right of capital account are completely bellow to the platform. Once the internal control is not strict because of the regulatory vacuum, the platform will escape and embezzle the client's funds without permission.

c) *Information security risks*: there are lots of user's information of in the platform, including identity, financial and contact information. The platform will also prone to trade the user's private information for illegal profiteering, or more easily become the target of hacker attacks. The security risk will result in leakage of personal information of the borrowers and lenders.

IV. P2P NETWORK LENDING RISK ASSESSMENT MECHANISM

A. Risk assessment process

The method to risk control in P2P network lending platform, on the one hand, we can check the credit qualification of borrowers and lenders, and On the other hand, regulatory platform needs to strengthen the operation supervision of P2P network loan platform. Social networking, online shopping, online travel and so on are everywhere in people's lives, so that people's everyday life is projected to the network bit by bit, and the production speed of data is faster and faster. Using large data association analysis to evaluate risk has also become an effective means. The risk assessment process of each main body involved in the platform is analyzed as fig. 2.

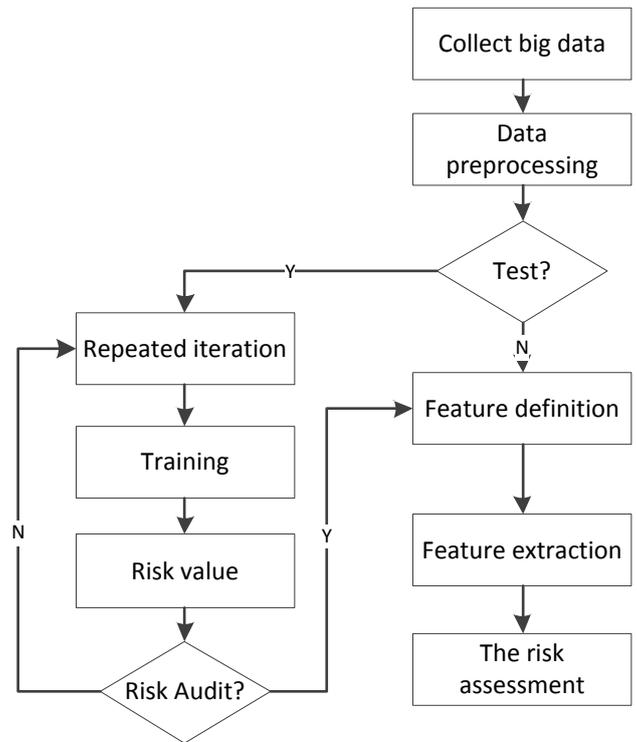


Fig. 2. Process of risk assessment.

B. Risk assessment of borrowers and Lenders in P2P lending platform

Network lending platform can analyze personal credit through big data of dealing with the user data, social network, and consumer behavior as fig.3. The platform will integrate the credit through the rich experience in risk control to establish a data model for risk control. The risk assessment model will guide the development and approval of business risk control, construct unified audit standards. It can improve the accuracy of risk assessment, but also can realize the automation of decision-making to reduce labor costs in the approval process.

1) *The individual credit analysis*. User's personal information is the important basis of user credit evaluation. Personal information is mainly refers to gender, age, family address, phone, work, and other inherent personal information.

For example, women investors are more conservative than men, the young and middle-aged has good economic ability and solvent, a highly educated people may have lower risk than the others. These factors are directly influence the risk. So the major factors are set as age, gender, job, educational background, address, school, income level, judicial record, and so on. These data can be as the features to machine learning,

2) *Asset information analysis.* Asset information of users can indicate that they have economic independence and risk tolerance. Such as user bank assets reach a certain level, the bank account have a certain degree of financial flows, has the fixed assets, vehicles that can reduce the risk of the users. Related factors are set to the bank assets, housing, vehicle fixed assets, personal average income, the average family's income, and etc..

3) *Analyze consumer behavior of consumer network.* The rise of e-commerce has changed people's shopping habits, and user transaction data has been recorded by e-commerce platform. Through the related data, it can analyze the consumption preference and repayment ability, so that the risk of customer loan can be accurately evaluated. Related factors are set to the month of consumption, consumption frequency and consumption preference, total consumption, and etc..

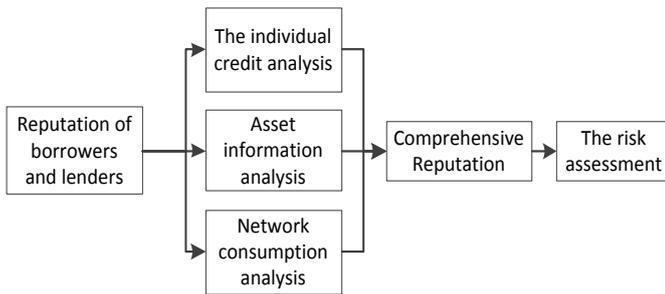


Fig. 3. Source factors of borrowers and lenders' risk assessment

C. Risk assessment of P2P platform by regulatory part

The early warning indicators were quantified, reasonable score criteria were drawn up, and then the corresponding risk levels were divided. The regulator will pay more attention to the emphasis who can't reach the standard. The construction of large data monitoring and warning system can give early warning of the risk captured, so that the related parties can grasp the risk fluctuation of the platform in a timely manner. On the one hand, it can effectively prevent the P2P net loan platform, the occurrence of illegal fund-raising fraud, run away some potential risks, but also to protect the relevant interests of investors; on the other hand, when the P2P net loan platform is not reach the standard, the regulatory authorities can give warning, positive guidance, rectification, and supervision standardized operation. The platform can also find its own problems, make internal rectification in time, and control the possible risks within the acceptable range.

Specifically, the system will grab information through news, forum, micro-blog network platform, and so on. Then it will combine with the network information system. According to the five dimensions, including characteristics of the illegal fund-raising case, comprehensive legal, illegal fund-raising

feature word, the high rate of return, negative feedback index, the propagation force. Compute the weight of each dimension through machine learning, and finally form a "risk index". According to the five dimension risk index, such as revenue rationality, complaint reporting quantity and compliance, the high-risk enterprises are investigated and compared with business, public security and other information.

1) *Compliance index.* It is considered from several factors such as enterprise qualification, business manager qualification, whether it is suspected of over scope operation and whether there is a false propaganda. Data can be obtained from the information library of business networking, website registration, etc.

2) *The deviation of yields.* From the deviation index of corporate commitment and the market average rate of return between considerations, yield deviation from the average rate of return can show platform inducements.

3) *The hit index of the characteristic words.* It is considered from the frequency of the keywords of illegal fund-raising risk in the corporate public opinion. By mining the key feature words in the past illegal collection of special case advertising promotion information, and matching the keywords. If there is a higher matching index, it will have a high hit rate.

4) *The index of transmissibility.* It is examined from several factors, such as the way of enterprise, the product publicity, and coverage and search rankings. The index is positively related to various factors.

5) *The negative feedback index.* It is considered from the amount of complaint information appearing in the public opinion, the higher the rate of complaint, the higher the negative feedback index.

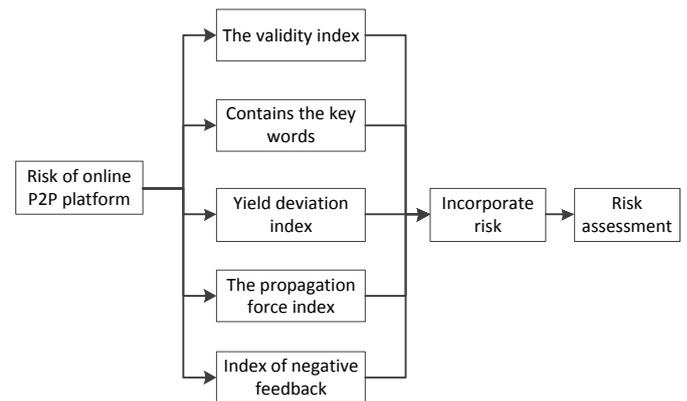


Fig. 4. Source factors of online P2P platforms risk assessment

V. CONCLUSION

With the continuous innovation of the Internet financial model, the P2P network loan platform has developed rapidly. It brings the financing convenience for individuals and small enterprises. The P2P net loan platform is different from the traditional financial mode. Its business process is completed through the e-commerce network platform. There is a direct relationship between borrowers and lenders. There are many problems in the standardization and accuracy of business risk

assessment. By analyzing the potential risk factors of China's P2P net loan industry participants, a risk assessment model is put forward from the two perspectives of P2P platform, debits, regulators and P2P platforms for risk monitoring in the operation of P2P network loan platform. For the risk of borrowers and borrowers, we should analyze user credit data from personal status, social network and consumer behavior, integrate risk, objectively evaluate risk value, guide wind control approval business, and improve audit efficiency. As for the risk assessment of P2P platform, it is a comprehensive of legal, illegal fund-raising feature word, the high rate of return, negative feedback index, the propagation force construction of the five dimensions. In order to quantify the early warning indicators, we develop a reasonable standard for evaluation, and divided the corresponding level of risk. If the P2P net loan platform is not up to the standards, it will list as the key object of supervision. Risk assessment is carried out through big data, and market risk is prevented. A monitoring and warning system for big data is built to provide positive energy for China's financial system improvement and credit system construction.

REFERENCES

- [1] Chen, D., & Han, C. A comparative study of online p2p lending in the usa and china. *Journal of Internet Banking & Commerce*, 2012, Vol. 17, No.2, pp.1-15.
- [2] Zhu, H. H., & Liu, X. Y. Multidimensional research on credit risk of p2p network credit based on big data. *Open Cybernetics & Systemics Journal*, 2014, Vol.8, No.1, pp. 1004-1008.
- [3] Dong, X. Research on Credit Risk Agglomeration and Control about P2P Network Lending Platform. *International Conference on Education, Sports, Arts and Management Engineering*, 2017.
- [4] Yao, F. G., & Sui, X. The Research to the Influential Factors of Credit Risk in the P2P Network Loan Under the Background of Internet Financial. *Proceedings of the 22nd International Conference on Industrial Engineering and Engineering Management 2015, 2016*, Atlantis Press.
- [5] Jin, Y., & Zhu, Y. A Data-Driven Approach to Predict Default Risk of Loan for Online Peer-to-Peer (P2P) Lending. *Fifth International Conference on Communication Systems and Network Technologies*, 2015, pp.609-613, IEEE.
- [6] Yan, J., Yu, W., & Zhao, J. L. How signaling and search costs affect information asymmetry in p2p lending: the economics of big data. *Financial Innovation*, 2015, Vol.1, No.1, pp.19.
- [7] Zhang, Y. P2p Personal Credit risk Identification Index Selection Research under Sharing Economy in China. *International Conference on Humanities and Social Science Research*, 2016.
- [8] Han, P., Li, X., & Guo, C. Research on the Combination of P2P Network Credit and Insurance Based on Game Theory. *International Conference on Humanities and Social Science Research*, 2016.
- [9] Guo, Y., Zhou, W., Luo, C., Liu, C., & Xiong, H. Instance-based credit risk assessment for investment decisions in p2p lending. *European Journal of Operational Research*, 2015, Vol. 1249, No.2, 417-426.
- [10] Emekter, R., Tu, Y., Jirasakuldech, B., & Lu, M. Evaluating credit risk and loan performance in online peer-to-peer (p2p) lending. *Applied Economics*, 2015, Vol.47, No.1, pp.54-70.
- [11] Wang, S., Fu, B., Liu, H., Jiang, Z., Wu, Z., & Hsu, D. F. Feature engineering for credit risk evaluation in online p2p lending, 2017, Vol.9, No.2, pp.1-13.