International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Research on Internet Financial Risk Management under the Background of Big Data

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Abstract: ***In recent years, with the advancement of big data technology and the vigorous development of information network technology, Internet finance has sprung up everywhere and has attracted wide attention. Compared with the traditional financial industry, Internet finance has the advantages of low transaction cost, low information asymmetry, and transaction de- intermediation. At present, China's Internet finance practitioners are mixed, and the risk supervision system is not perfect. These problems will generate many uncertain Internet financial risks. The author analyzes the various risks faced by Internet finance in the context of big data and proposes feasible suggestions to provide theoretical basis for government regulatory authorities.***

Keywords: Big Data, Internet finance, Risk, Countermeasures

1. Introduction

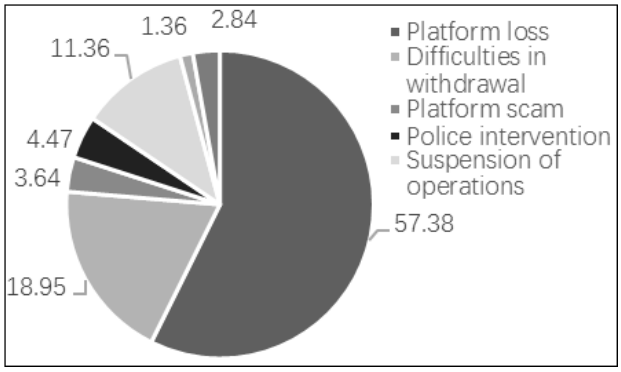
According to the "43th Statistical Report on Internet Development in China", as of December 2018, the number of Internet users in China has reached 829 million. Among them, the number of Internet users using online payment reached 600 million. The popularity of the Internet has greatly changed people's lifestyles, and Internet finance came into being. Figures 1 and 2 show the growth of the Internet finance sector during the three-year period from 2016 to 2018.

Table1: The usage rate of various Internet applications of Chinese netizens

	2018.12		2017.12		2016.12	
application	User size (million)	Netizen usage rate	User size (million)	Netizen usage rate	User size (million)	Netizen usage rate
online payment	60040	72.5%	53110	68.8%	47450	64.9%
online banking	41980	50.7%	39911	51.7%	36552	50.0%
Internet finance	15138	18.3%	12881	16.7%	9890	13.5%

Since 2013, online banking , P2P network lending , crowdfunding financing, and network insurance have been blooming, and they have sprung up. As of the end of October 2016, there were more than 4,000 P2P online lending platforms in the Chinese market, leading the world. However, science is a double-edged sword. When people enjoy the convenience and convenience brought by technology, there are also a lot of uncertain risks. For example, online financial fraud has emerged in an endless stream. The use of the Internet for cash, cash, money laundering and other illegal activities has been repeatedly banned, and the amount of crime and harm are increasing. Through the analysis of the causes of P2P platform problems (see Figure 3), it is found that the proportion of lost P2P platforms is reached. 57.38%, the police involved 222 platforms, accounting for 4.47%. Because Internet finance involves the intersection of various industry sectors, it poses a challenge to Internet regulation. The current legal system is far from meeting the speed of innovation and development of today's finance, and there are obvious loopholes and gaps in supervision. In today's continuous improvement of big data technology, we should make full use of the analysis of Internet financial big data, and use the method of building big data to model the risk control and risk warning of borrowers, which can be used to prevent Internet financial risks more specifically.

Table 2: Platform reasons for P2P online lending problems



2. An overview of Internet financial risks

Internet finance is a combination of traditional financial industry and emerging Internet technology. It is mainly a new type of financial service that uses third-party payment, social networking, cloud computing and search engine and other high-tech Internet technologies to achieve mutual financing, investment, payment and information intermediary services. Mode, which is essentially a direct financing method. Internet finance has the advantages of low transaction cost, low degree of information asymmetry, expanded collection of transaction possibilities, de-intermediation of transactions, payment reform and monetization of financial products. The emergence of Internet finance is conducive to revitalizing China's social funds, helping to accelerate the transformation of traditional financial models, and at the same time providing new channels for SME financing loans.

Internet finance has not changed the nature of finance. The risks of traditional financial industry still exist, credit risk, operational risk, and legal risk. At the same time, Internet finance has added some new risks with Internet characteristics, such as network security risks and terminal security risks. With the continuous development of the Internet financial industry, the breadth and depth of supervision will gradually increase. As a new thing, each

country has no mature methods and measures. For the regulatory authorities, it has always been a problem. The development of big data has brought new opportunities to Internet regulation. It is extremely urgent to standardize the Internet financial industry, curb the growing trend of Internet financial risk accidents, and establish and improve a regulatory system that is in line with the development characteristics of Internet finance.

3. The Concept and Characteristics of Internet Financial Data

Traditional financial credit data is registered by the user in the bank credit information system to provide identity information, credit information, non-financial liability information, and the bank archives it through identity verification. Therefore, there are shortcomings such as information asymmetry, high cost of manual collection, low efficiency, and few data acquisition channels. The current Internet data collection in China is mainly through users' shopping records on some shopping websites, APP, central bank's credit information system, academic qualifications, bank card consumption (UnionPay), and Alibaba's Sesame Credit. As a hot spot of current attention, big data is widely used in information processing through various algorithms and high-speed network operations. The concept of big data was first proposed by American experts in 2008. So far, big data has not been completely unified. The generation of the Internet has greatly facilitated the collection of financial data, but how to mine valuable information in a large amount of data is the key to efficient use of big data. Internet financial data mainly comes from user transaction data, operational behavior data, text data, etc. in the Internet. Currently, there are three characteristics that are widely recognized, namely, huge amount of data, high application value and diversity.

3.1 The amount of data is huge

At present, user data on the Internet in China has reached a new order of magnitude. Compared with the traditional financial industry, due to the popularity of the Internet, Internet finance has a low barrier to entry. Different levels of social groups can participate in Internet financial convenience services, which provides an objective basis for collecting massive amounts of Internet financial user data. Big data can be tapped into the applicant's multi-dimensional information, including not only personal identity, but also personal interests, academic background, consumer trends, social interaction circle of friends. For example, the interpersonal crawler system developed by Alibaba, through the establishment of a data model, through the algorithm for correlation analysis. Ali also relies on its vast database of B2B, Taobao, Tmall, Alipay and other APP products (click volume, transaction volume, order quantity, word of mouth evaluation) to accurately analyze market conditions and advertise. In short, while Internet finance has expanded the enterprise user service group and acquired big data, it has also greatly improved the operational efficiency of enterprises.

3.2 High application value

The era of big data can be tapped into comprehensive data (the breadth of data), strong effective data (depth of data), and time-sensitive data (timeliness of data) through network technology. Through real-time analysis of data, Big Data Finance unearths the transaction records and consumption habits left in the daily Internet life of customers. Since they are first-hand information obtained from the user community, they can predict user behavior more accurately. Not only that, big data analysis also provides a scientific basis for senior leaders to make decisions, helping companies to prevent and control various Internet financial risks. Through big data, we can also achieve refined and personalized services for customers, and build data models to analyze data and improve the adhesion to customers. The high application value of internet financial data depends on the efficiency and degree of mining and utilization of internet financial enterprises. As an enterprise, advanced information management technology should be introduced, and the characteristics of the current Internet financial industry should be combined to analyze the different application values of user data.

3.3 Data diversity

Internet financial data includes structured data, semi-structured, and unstructured data, such as textual data. There are various types of financial services in the Internet finance industry, such as common P2P network lending, online insurance and electronic payment services. Different forms of financial services will generate different types of Internet financial data.

4. Internet financial risk characteristics under the background of big data

4.1 Credit risk

The credit risk of internet finance refers to the risk of economic losses caused by financial traders in the Internet when the contract expires, in accordance with the obligations in the contractual agreement. Internet finance in the context of big data involves more and more parties to the transaction and lacks standardized financial information. It is difficult to verify the authenticity of the information provided by the other party if the counterparty does not meet each other. In order to seize customer resources, some Internet companies have developed a number of high-leverage, unsecured, unsecured lending products, and China's social credit system is not perfect, which increases the degree of Internet financial credit risk. Some users take advantage of information asymmetry to defraud loan funds through information fraud. There are also some adverse selection issues in economic activities. For example, most of the creditworthy customers can borrow through the compliant banking system, and some users with unstable income and poor credit quality are pushed to the Internet finance side. Obviously, we can't use the traditional financial industry evaluation method to measure these credit risks with obvious Internet characteristics. We need to establish data analysis models and assessment techniques to reduce the probability and seriousness of credit risks in the fragmented information environment. degree. More importantly, at present, a large number of users' private

information is obtained through data mining. In China, there is no document that has clear legitimacy. All data analysis is based on the enterprise to obtain profit through the mobile phone to the user's secret information.

4.2 Technical risks

Technical risks mainly include network security risks, platform security risks, and data security risks. The development of Internet finance relies on a powerful computer communication system. The safe and orderly operation of computer programs and software systems is the key to the continuous development and progress of Internet finance. The importance of computer network system technology risk management and control can be imagined. The imperfect key management system and encryption technology provide hackers with the opportunity to attack. The hackers steal transaction data during the process of transmitting data between the client and the server, which damages the interests of the traders and disrupts the normal operation of the Internet. Financial security. In recent years, network leaks have occurred in various countries around the world, which has sounded the alarm of technical security. In addition, the Internet transmission protocol currently uses the TCP/IP protocol family. The security of the protocol is flawed and the protection mechanism is not perfect. Traditional financial risks may bring damage to local areas. Once Internet financial risks are generated, they will spread and spread rapidly through the network, resulting in a domino effect and a great degree of harm. In 2012, Symantec released the White Paper on Uncovering the World of Financial Trojans. In 2012, more than 600 financial institutions in the world were attacked by online banking Trojans. Therefore, network technology security risks are also one of the urgent problems to be solved.

4.3 Legal risks

The continuous innovation and development of Internet finance has led to various forms of Internet finance industry, such as P2P lending, third-party payment, and crowdfunding. However, the current Internet legal policy has not standardized and completed the laws of each format. However, the current practitioners are uneven and lack professional financial knowledge. The threshold for consumers, investors and practitioners to enter the Internet industry is very low, which brings some thorny problems to the legal department. Financial fraud and illegal fund-raising activities have emerged in an endless stream, seriously hampering the development of the future Internet financial ecology. Many of the shackles of financial innovation have no legal basis for the operation, and the existing Internet legal documents do not clearly give relevant specific instructions, thus leading to many cases of illegal fund-raising. For example, the “e-rental” event, the third-party payment, the hidden amount of money laundering by the user to pay for information, and the like.

4.4 Liquidity risk

Liquidity risk is the most frequent and most serious type of risk in the financial industry. There are two main situations. First, the amount of customer wealth management is greater than the funds of the creditor's rights. The wealth management users recharge the account on the network platform, but they cannot buy wealth management products. The advertisements on the surface of the business are promoting the advertisement of hunger marketing. Actually, there is no Sufficient bonds are matched, and the result is not only the problem of interest generated by funds, but also legal issues. Second, when the size of the customer is larger, the liquidity risk will be greater. In this case, it will face The risk of a run-off of the customer's collective batch redemption.

4.5 Risk of violation of consumer rights

At present, China is still not paying enough attention to the protection of Internet consumer rights. Under the big data market, the leakage of consumer information privacy has become a hidden danger. How to protect the rights and interests of consumers is not a violation of Internet risk management. Because consumers are in the process of trading on the Internet platform, transaction information is easily leaked and stolen in the process of network transmission, which in turn affects the safety of consumer funds. In addition, during the transaction process, both parties to the transaction cannot verify each other's credit information on the spot, and there is a certain moral hazard. In the case that the Internet credit supervision environment is still not secure, the violation of consumer rights is extremely likely to occur. At present, the Internet supervision and credit system is still not perfect. The cost of default on the Internet platform is too low. There is no final lender to protect each other, and the weight of consumers taking risks is greater. If there is a default or a run, the final risk can only fall on the consumer. Nowadays, new techniques of financial transactions such as two-dimensional code payment and fast payment are often targeted by lawless elements and become the medium of crime.

5. Internet Financial Risk Counter Measures under the Background of Big Data

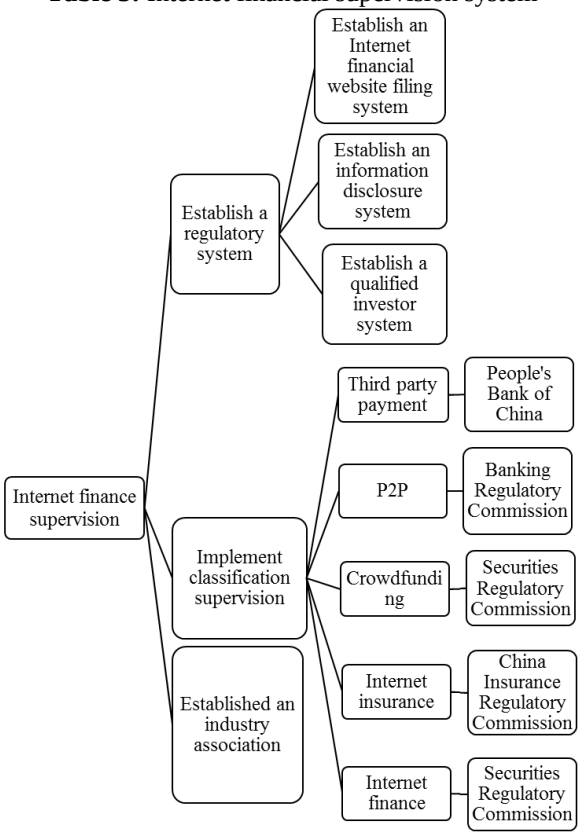
5.1 Improve lawss and strengthen government supervision

The supervision of the Internet mainly includes the formulation of laws and strict enforcement by government regulatory authorities. The scope of Internet financial transactions is expanding day by day, and it has gradually penetrated into various commercial fields of society, and its business is ever-changing and large. The original legal system has not kept up with the rapid development of the Internet. First of all, the legal department must constantly improve the laws related to Internet finance, and clarify the rights and obligations of the various entities of Internet finance in terms of the legality and security of electronic transactions. China is a typical separate supervision model, and it is very important to establish an integrated supervision model. At the same time, coordinate the regulatory role of various regulatory authorities to prevent duplication of supervision. In the supervision, we must weigh the degree of encouragement of financial innovation and supervision. Too much relaxation of vigilance can easily lead to industry confusion, and too restrictiveness is

contrary to the market atmosphere of today's "mass entrepreneurship, innovation".

As the main body of market activity regulation, when the market fails, it should make full use of this “visible hand” to learn from and draw on some successful experiences of other developed countries in the regulation of Internet finance. Establish a dynamic regulatory mechanism, speed up the formulation of legal policies for the current Internet financial market, and more importantly, strictly enforce the legal system, make full use of big data to strictly supervise enterprises, and prohibit illegal enterprises from disrupting the market. The existing Internet supervision system (see photo) comes from the release of the “Guiding Opinions on Promoting the Healthy Development of Internet Finance” in 2015. The document proposes the supervision body “regular supervision, appropriate supervision, classified supervision, coordinated supervision, innovative supervision”. in principle.

Table 3: Internet financial supervision system



Through the policy review issued by the national regulatory authorities from 2013 to 2018 (see Table 4), it is found that the existing Internet financial supervision system is still improving, but the regulatory body remains to be clarified, the supervision is not uniform, and the supervision effect is uneven. Inadequate, the regulatory methods issued by different regulatory bodies lack systematic links, which will hinder the healthy development of the Internet financial industry.

5.2 Build an internet financial security system and strengthen risk prevention

The level of Internet development in China today is far less than that of other developed countries. Most Internet software and equipment rely on foreign imports. In the Internet hardware and software, there is very little independent property rights, so it is easy to cause information leakage, resulting in the loss of consumer interests, and even endanger national security. In addition, in recent years, more and more hackers have attacked servers by exploiting some flaws in computer systems, stealing a large amount of customer information. It is extremely urgent to construct a complete set of Internet systems with independent property rights in China. Therefore, it is mainly necessary to promote the development of China's Internet security system from three aspects. First, vigorously support and encourage Chinese research scholars in the development and technical research of Internet encryption technology, such as firewall technology. Improve China's Internet financial security guarantee coefficient and protect China's financial operation security. Second, improve the investment of China's Internet in software and hardware, so that the computer system has certain anti-attack and anti-virus capabilities to ensure the security of the Internet financial hardware environment. Third, standardization of Internet finance technology. By establishing a system's Internet standards, it will be in line with international standards as soon as possible, paving the way for further catch-up in the Internet field.

5.3 Popularizing big data and conducting credit assessment

In the past, financial institutions represented by banks have made judgments on customer credit by judging some of the customer's registration information and the credit system of major banking institutions. This judgment method often includes some personal experience of the investment manager. This kind of analysis is obviously not scientific and accurate. It is a general trend for Internet finance companies to use big data for risk control. At present, many e-commerce receipts and sellers use the seller's registration information, customer favorable rate, sales data, star rating and other information for big data mining analysis, and establish a mathematical scoring model for sellers. Establish a credit report. Through a comprehensive and multi-dimensional understanding of customer credit information, it will greatly reduce business risk. At present, the representative of the country is the Tmall, Taobao, Alipay and so on under the Ali system. For the national level, through the collection and classification analysis of big data, the national Internet credit information system should be established to realize information sharing. The supervisory agencies are obliged to monitor the Internet platform in China in real time, and force the Internet financial institutions to disclose relevant information on a regular basis. Information and risk tips. Raise the illegal cost, do not give the lawless elements a chance to stop the Internet financial crimes.

5.4 Innovative Internet finance supervision mode

The Internet is characterized by virtualization and networking. Therefore, Internet governance is a huge challenge for the regulatory authorities. The rapid development of Internet finance, the ever-changing business

format, and the cross-integration of business scopes, the traditional Internet financial sector supervision model is obviously not in line with today's situation. At present, many laws in the field of Internet finance in China are not perfect or even supervised. Breaking the traditional Internet supervision mode and creating a new system is an inevitable trend of Internet finance development.

Government departments should address the regulatory challenges through the following measures. First, the establishment of a joint supervision system for various departments. In the past, the divisional supervision policy of the "Silver Insurance Supervisory Committee" has been stretched, and the joint conference system including various departments including industry and commerce, justice, and industrial letters has been introduced. Second, we must strengthen global cooperation. Internet finance has entered the stage of globalization. Countries should actively unite and communicate with each other, crack down on cross-border financial money laundering crimes, and create a healthy Internet ecological financial environment. Third, it is necessary to have targeted regulatory measures to clarify the various regulatory bodies. Different Internet supervision modes involve different risks, distinguish between credit risk and liquidity risk, and determine different implementation strategies.

6. Conclusion

The rapid development of Internet technology has driven the emerging innovation of Internet finance, which has brought great convenience to people's lives. Science is a double-edged sword. People enjoy some conveniences while also experiencing some difficult problems. Accelerating Internet financial chaos is a critical task facing today. Government departments should promote the construction of Internet security and safeguard the legitimate rights and interests of all parties. Through the use of big data to establish and improve the Internet financial credit system, improve the legal mechanism, fill the regulatory gap, improve the criminals' illegal cost of breach of contract, and promote the healthy development of Internet finance. At the same time, it is necessary to have specific legal rules for different formats, joint development of various departments, and network security prevention system for information sharing. In important areas, you can learn from some foreign Internet financial governance experience. In addition, the formulation of laws is not a matter of once and for all, and needs to be continuously improved and optimized to adapt to the new development of the industry.

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