The Research on Internet Financial Flow Risk Measurement and Statistical Based on Analytic Hierarchy Process

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Abstract: As a decision-making method of qualitative and quantitative analysis, AHP has the advantages of flexibility, system, simplicity and convenience. It has important instrumental significance in the assessment of Internet financial liquidity risk. This paper adopts the concept and formation of Internet financial liquidity risk. The reason is discussed. On this basis, the analytic hierarchy process tool is introduced. The model is used as the carrier to measure and count the Internet financial risk, so as to provide a useful reference for the prevention and control of Internet financial flow risk.

1. Introduction
On July 18, 2015, the central bank and other ten ministries and commissions issued the “Guiding Opinions on Promoting the Healthy Development of Internet Finance”. On December 21, 2015, General Secretary Xi Jinping proposed at the Central Economic Work Conference “Hurry to carry out special rectification of Internet financial risks” It indicates that China has upgraded Internet financial risk supervision to an important part of economic management. To rectify Internet financial risks, special attention should be paid to their liquidity risks. Liquidity risk is the most typical and most lethal risk of traditional finance. Internet financial liquidity risk is an extension and variant of traditional liquidity risk in the Internet environment. In the primary development stage of Internet finance, liquidity risks have not yet fully emerged, but many aspects show that some risk factors are growing.

2. The concept of Internet financial flow risk
2.1. Definition and generation mechanism of internet financial liquidity risk
Regarding the liquidity risk of Internet finance, there is no authoritative definition yet, which can be identified from the two end faces of Internet finance and liquidity risk. The former refers to a new financial business model in which traditional financial institutions and Internet companies (both collectively referred to as practitioners) use Internet technology and information and communication technologies to achieve financial, financial, payment, investment and information intermediary services. The latter refers to the commercial bank's ability to solvency, but it is unable to obtain sufficient funds in time or to obtain sufficient funds in a timely manner at a reasonable cost to cope with the risk of asset growth or payment of debts due, and its terminal performance is “squeezing”. Therefore, the Internet financial liquidity risk can be defined as: the risk that the Internet financial enterprise cannot obtain sufficient funds in time or can not obtain sufficient funds in a timely manner at a reasonable cost to cope with asset growth or pay debts due, and the investment group cannot meet...
the expected period. The key point is that the matching of wealth management funds and credit assets has formed unreasonable misplacement in quantity and time limit, resulting in loss of expected income. Internet finance includes financial activities operated by traditional financial institutions relying on Internet platforms and financial activities operated by Internet-based institutions. The essence is still financial. Internet financial liquidity risk inherits the main genes of traditional financial liquidity risk, and its formation mechanism is highly correlated with traditional finance, but it is different.

2.2. The special role of Internet technology in generating financial liquidity risk

The technical basis of internet finance is Internet technology and information and communication technology. In terms of financial liquidity, the role of the Internet is particularly prominent, and its positive and negative effects are just like the sharp "double-edged sword." On the one hand is its inhibition of liquidity risk. The Internet has a large amount of information, high efficiency, unbounded widening the channels for all employees to participate in financial activities, and the innate advantages of realizing big data acquisition and analysis, and the formation of four functions of payment and clearing, price information, risk management and resource allocation of financial system functions. Effective coupling, showing a flat and efficient and transparent intermediary form, has a positive effect on the suppression of liquidity risk: First, to improve the rationality of investment. With big data support, investment institutions can manage liquidity through analysis of user behavioral habits. Investors can also use the Internet to reduce information asymmetry and improve investment rationality. The second is to expand investment diversity. With the aid of analytical tools, investment institutions can design a variety of financial product alternatives while carefully analyzing the supply and demand sides and the economic environment, thereby expanding the probability of successful matching of funds and claims. The third is to reduce the impact of concentrated liquidation. There are many Internet financial investors, small single investment, and scattered funds. Even if there is a concentrated redemption, the impact on investment institutions is relatively small. On the other hand, it promotes the liquidity risk: First, the superposition of virtuality increases the unpredictability of financial law. The combination of the Internet and finance is actually a "virtual virtual connection." Finance is the virtualization of money. It is replaced by the three states of the real thing, the metal, and the credit, and tends to be symbolized. When it enters the investment field, it is represented by higher-level bill certificates such as stocks, bonds, and funds. Their circulation and transformation form a unique law that is not manipulated by human will. The Internet is “re-virtualized”, digitizing entities. In the financial sector, it turns notes of value into pure data symbols or codes, and even abstracts into electronic money. The fusion of the two forms a combination of virtual and virtual with the abstract as the base and the virtual as the index. The level of abstraction increases, and the law of operation is more difficult to grasp. Second, the complexity of financial products and the proliferation of information have increased the probability of wrong investment. Financial innovation and the continuous development of financial derivatives will expand investment choices, but new varieties will inevitably be mixed, making it difficult to measure their benefits. While the Internet has increased market transparency, it also generates a wealth of information, causing information noise to drown the real valuable information, resulting in new information asymmetry and increasing the probability of mis-election. The third is the difficulty of short-term loans to strengthen the mismatch of maturities. Internet finance has largely met the needs of civilian investment and SME financing. The overall quality of the terminal is low, and the blindness is strong. Its financial base and return demand are relatively limited. The rapid profitability is expected to be strong, focusing on the short-term, plus The threshold for redemption is low, and the redemption is highly random, which is a very unfavorable situation for the maturity mismatch between funds and creditors. Fourth, the operation is convenient, the supply and demand rise simultaneously, and the possibility of a run on the run is increased. The significant advantages of the Internet are that it is convenient for service and convenient to operate. In the normal state, it helps to improve service level and efficiency. However, if it enters an abnormal state, it also provides “convenience” for many investors to simultaneously realize centralized concentration. In addition, the Internet brings together both the supply and demand sides of the funds,
stimulating simultaneous growth on both sides. Although the scope of investment options has been expanded, it has increased the possibility of unreasonable matching. The realizing energy is aggregated through the network at a certain point in time, which will generate a terrible “squeeze” pressure. Fifth, the conditions of the guarantee are congenitally insufficient and the risk level is raised. Traditional financial institutions are protected by deposit reserve, risk asset provisioning and deposit insurance, which provides a bottom line for preventing liquidity risks. The Internet finance model lacks the experience and measures to deal with short-term liabilities and unforeseen capital outflows. Once there is an unforeseen event, it will make liquidity risk a high-risk barrier lake.

2.3. Main factors affecting the generation of Internet financial liquidity risk
The factors affecting the liquidity risk of Internet finance are basically the same as traditional finance, but the connotation, weight, intensity and approach have changed. From the perspective of the small financial market environment, it mainly includes five aspects: First, the quality and operation level of the operating institutions themselves. The main performance is to grasp and analyze the situation of investment supply and demand, production of financial products, absorption, reserve and management of funds, control of capital flow, assessment and control of risks and other capabilities. The second is the quality of financial products. Mainly reflected in the investment project, the rationality of the financial plan, the possibility of profit, and the safety. The third is the number and quality of investment and financing. Factors such as the number and quality of investment and financiers, investment psychology and ability, financing motivation and ability, and profit expectations often affect the degree of matching of funds and assets. The fourth is the flow of investment funds. The main performances are investment volume, flow direction, profit expectation, and divergence, which are in line with the objective laws and actualities of matching funds and assets. The fifth is the “quality” of the market. The first is market transparency, which is reflected in whether financial institutions, investors, financing companies, government agencies, etc. can control the objective situation in a true and complete manner. Secondly, the market credit is expressed as whether the above parties can be honest and adhere to the spirit of the contract. Once again, it is the level of market ethics and law, which is reflected in whether the above-mentioned parties can abide by the law and prohibit the law. Sixth is the technical level. The main performance is the advanced technology, security and operational efficiency of the network system. The higher the quality and level of these five aspects, the lower the risk. From the perspective of the financial market environment, it mainly includes three aspects: one is the government's financial policy and the amount of money placed, the second is the government's regulatory policies and laws and regulations, and the third is the operation status of the financing enterprises.

3. The real cause of Internet financial liquidity risk
According to the mechanism of Internet liquidity risk generation and the analysis of current Internet finance related situations in China, it is possible to predict the possibility of this risk reality.

3.1. The institutions are mixed
Internet finance practitioners are generally divided into broad categories: traditional financial institutions and Internet companies. The former has deep accumulation, solid foundation, and standardized management. It is relatively difficult to induce liquidity risk by network factors, and it can also regulate Internet financial liquidity and become the “total valve” to suppress this risk. However, there are still internal ills, such as structural and policy issues, directly affected by the macro economy, and the traditional liquidity risks are hidden. Because it has been deeply integrated into the Internet, traditional liquidity risks are likely to be radiated to other parties through the network. In addition, the huge volume may induce or boost the liquidity risk of Internet finance. The main feature of the latter is “small, miscellaneous, chaotic”. “Small” refers to the existence of small loan companies, finance companies, investment consulting companies, and limited partnership private equity funds. The foundation is thin, the experience is low, the overall quality is low, and the ability to regulate
liquidity is poor. “Miscellaneous” refers to the mixed qualifications of the industry. A considerable part of the enterprises or private financial credit companies without government permission are outside the scope of supervision. “Chaos” means that it is in a blind spot of supervision. The main operation is easy to surpass the main business scope, and adopts illegal acts such as disguised money, illegal fund-raising, financial pyramid selling, and online gambling. These objective reasons even include certain moral hazards and are likely to be catalysts for the generation of liquidity risks.

3.2. The number of investment and financing companies is huge
The biggest feature of Internet finance is the large number of participants. A large proportion of the hundreds of millions of Chinese netizens have joined the online investment and financing industry, becoming a potential importer of liquidity risk generating energy and a realistic bearer of risk outcomes. The main body of this group is the middle and lower classes of society. The overall characteristics are low-end, irrational, thin family, and poor tolerance. Once the investment fails, it is easy to trigger group events and even impact social stability.

3.3. lack of control over the flow of funds
At present, the amount of funds entering the Internet financial market is limited, but the growth rate is rapid, and it is concentrated on a number of platforms or products to form a pool of funds. The main performance is the rapid expansion of third-party payment platforms and the absorption of large amounts of funds. These pools of funds that have accumulated huge amounts of money and are connected to investment are essentially the origin of liquidity risks. From the current point of view, the relevant enterprises have strict management of the fund pool, but their customers are mostly injected with idle funds, and are also used for consumption payment at any time. Funds may be redeemed at any time, resulting in a reasonable degree of mismatch in the maturity of the maturity. In the case of large-scale promotion activities, the fund pool is very likely to face huge redemption. If not properly handled, the fund will be discounted, the income will fall, and the investor confidence will be impaired, causing a “swing”.

3.4. Market information is confusing
Internet finance has dispelled the “missing fog” of market information to a certain extent, but it has not completely eliminated it, and it has created “shadowing confusion” and formed “smog” coexistence, so that information asymmetry still exists. First, the right to know is incomplete. The proliferation of insider information in the financial industry has led to asymmetry in the right to information between levels. The second is from the explosive growth of data. In the Internet financial market, the time and cost of information collection and identification are high, the false information is flooded, and the data is highly professional, which can alienate information into a shelter. The third is from the Internet financial services. All the businesses are running online, the whole process is full of virtual factors, and the distortion is serious. It is difficult for practitioners and investment financiers to know the truth. The fourth is from information barriers. In order to break through the information, subjective organizations need to block information, and they are separated from each other by information barriers. They are in the “information island”, the contradiction between the privatization of information and the financial socialization brought by the network.

4. The application of AHP theory in Internet financial flow risk measurement and statistics
4.1. The concept of analytic hierarchy
The analytic hierarchy process was first proposed by the American operations researcher T.L. Satty in the mid-1970s. It refers to the decision-making method of decomposing the possible influencing factors of decision-making into goals, criteria, and program measures, and then conducting qualitative and quantitative analysis. This method relies on the subjective choice judgment of experienced evaluators, so it is flexible, systematic, and The advantages of simplicity and convenience. The
analysis program has been widely used in many fields such as behavioral science, education, medical care, environmental assessment, transportation and economic planning management, and has a fairly mature market application. At the same time, the analysis release can be used in daily life. The reason for using this analysis method in Internet financial liquidity risk assessment is mainly because it has the following advantages over other analysis methods: 1) It can combine the risk factors to make a comparison of the importance of the two, so that decision makers can comprehensively measure the importance of each indicator. 2) Analytic Hierarchy can not only assess uncertainty and supervisory information, but also logically combine individual experience, intuition and insight to make a comprehensive assessment, which has strong practical significance in Internet supply chain finance. 3) The analysis method is easy to understand, simple and clear, and has strong operability.

The specific operational steps of the analysis method have the following main aspects: The first step is to establish a hierarchical structure model: hierarchically determine the decision problem, and the hierarchy can be divided into the decision target layer (the highest layer), the criterion layer (the middle layer), and the preparation. The selection layer (the bottom layer) may have a sub-criteria layer according to the division requirements. The high level includes the sub level, and so on.

The second step: constructing the judgment matrix of all the factors in each level: it is necessary to compare the importance degree of each factor in the sub-structure that affects a certain factor. The factors that belong to the same factor are compared by a certain criterion to determine the importance score and fill in the matrix.

| Importance level | Meaning               | Description                                      |
|------------------|-----------------------|--------------------------------------------------|
| 1                | Equal importance      | Compared with the two factors, they have the same importance |
| 3                | Slightly important    | One factor is slightly more important than the other compared to the other two factors |
| 5                | Obviously important   | One factor is significantly more important than the other compared to the other two factors |
| 7                | Very important        | One factor is more important than the other compared to the other two factors |
| 9                | Extremely important   | One factor is more important than the other because of two factors |
| 2, 4, 6, 8       |                       | Intermediate value of the above adjacent judgment |

The third step: hierarchical single sorting and consistency check: ① calculation consistency index CI: the maximum eigenvalue of the judgment matrix. ② Find the consistency indicator RI. ③ Calculate the consistency ratio CR. When CR<0.1, the judgment matrix consistency is considered to be within the acceptance range; when CR>0.1, it is necessary to repeat the steps after the revision and then re-find the weight coefficient matrix.

| n   | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| R   | 0  | 0  | 0.2| 0.9| 1.1| 1.2| 1.3| 1.4| 1.4| 1.4| 1.5| 1.5| 1.5| 1.5|
| I   | 1  | 0  | 0  | 2  | 0.9| 2  | 4  | 6  | 1  | 6  | 9  | 2  | 4  | 6  | 8  |

The fourth step: the total order of the hierarchy: on the basis of the hierarchical single ordering, calculate the relative weights of all the elements of each level for the decision target layer, and sort the alternatives. It is the product of the weight of each factor relative to the criterion layer and the product of the criterion layer relative to the decision target layer.
4.2. Internet financial risk measurement and statistics

4.2.1. Creating a hierarchical model

Introduced yaahp analysis software. Using yaahp analytic hierarchy software, it can be constructed according to the identified indicators as the following hierarchical structure of Table

| Criteria layer | Sub-criteria layer | Options |
|----------------|-------------------|---------|
| Financing enterprise qualification (A) | Basic quality of the enterprise (A1) | Managerial quality (A11) |
| | | Employee quality (A12) |
| | | Corporate Governance (A13) |
| | | Solvency (A3) |
| | | Profitability (A4) |
| | | Growth ability (A5) |
| Core Qualification (B) | Credit status (B1) | Industry characteristics (B2) |
| | | Profit level (B3) |
| | | Internet application (B4) |
| | | Industry development status (C1) |
| | | Sharing level (C21) |
| | | Tightness (C22) |
| Upstream and downstream relationship (C2) | Internet integration (C3) | Information processing capability (C31) |
| | | Information sharing level (C32) |
| | | Overall information level (C33) |
| | | Past performance (C4) |
| Trading Product Features (D1) | Trading project risk assessment (D) | Price stability (D11) |
| | | Value realization ability (D12) |
| | | Debt clarity (D13) |
| | | Aging period (D21) |
| | | Bad debt rate (D22) |
| Accounts receivable characteristics (D2) | Policy environment (E1) | Government support (E11) |
| | | Relevant laws and regulations (E12) |
| | | GDP appreciation rate (E21) |
| | | Macroeconomic environment (E22) |

After determining the corresponding indicators and scoring rules in combination with specific situations, the credit risk levels of the financing enterprises are classified as follows: 90 points and above are AAA-level risk ratings, indicating that corporate credit is excellent; 80-90 points (including 80) are AA Level risk rating, indicating good corporate credit; 70-80 points (including 70) is a Class A risk rating, indicating corporate credit in general; 60-70 points (including 60) is a BBB risk rating, indicating poor corporate credit; 50-60 points (including 50) are BB-level risk ratings, indicating that corporate credit is poor; 50 points and below are B-level risk ratings, indicating that corporate credit is extremely poor.

| Corporate credit risk rating | Credit risk rating | credit status |
|-----------------------------|-------------------|---------------|
| 90 points and 90 points or more | AAA | Credit excellence |
| 80-90 points (including 80) | AA | Good credit |
| 70-80 points (including 70) | A | General credit |
| 60-70 points (including 60) | BBB | Poor credit |
In the process of internet financial liquidity risk assessment, the above analytic hierarchy process can quantitatively and qualitatively analyze the risk level, so as to make a comprehensive assessment of the enterprise's risk exposure. At the same time, the standardized rating results can clearly identify the risk of the enterprise at a glance, so that financial institutions or corporate leaders can make investment and financing decisions. The development of the Internet provides a more adequate basis for the evaluation of Internet financial liquidity risk. Internet financial liquidity risk assessment should consider not only the financing enterprises, core enterprises, etc., but also the new opportunities that the Internet big data environment can bring to the development of Internet finance. The cloud computing platform system can maximize data mining. And the role of evaluation, multi-dimensional integration of all known real data of financing enterprises, creating a quantifiable financing enterprise information data space, no longer relying entirely on the financial reports provided by financing companies, taking the initiative, making risk measurement and Statistics have become more reliable. Today, as information technology continues to infiltrate into various fields, traditional enterprises need to shift to a new business model, and Internet finance companies are no exception.

5. Conclusion:
This paper provides a reference for the study of the assessment of Internet financial liquidity risk, which can help financial enterprises choose whether to lend to financing enterprises and measure the level of credit risk. The smooth progress of internet finance mainly depends on whether the actual data can be used to objectively assess the risk. The evaluation of big data not only increases the feasibility and credibility, but also reduces the high risk assessment of financing enterprises. Cost while streamlining business processes. In the industry, each enterprise engaged in financing business for the upstream and downstream of core enterprises should, while expanding the scale of business, conduct more real-time control over the platform resource data, improve the financing enterprise credit file, and avoid the outsourcing and endogenous supply chain. The main body and the Internet have specific risks, which are of great significance for the prevention and control of Internet financial liquidity.

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