Analysis of the Credit System of Internet Consumer Finance Companies

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Abstract

As an important part of consumer finance, Internet consumer finance plays a vital role in leading innovation and promoting consumption, and thus deserves great attention. Therefore, this paper focuses on the construction of the credit system of Internet consumer finance companies, adopting a research approach that combines theoretical analysis and case studies. Through theoretical analysis, we found that the credit scoring system has evolved from expert scoring cards and machine learning models to artificial intelligence; through case studies, we observed that in the process of constructing the credit system, not only technological innovations have emerged, but also the sources of credit information have undergone significant changes. This study systematically sorts out the development process of the credit system and compares the differences between Internet consumer finance credit risk and traditional credit risk, such as differences in information sources and technical levels. Meanwhile, this paper also identifies that the Internet consumer finance credit system, which relies on big data as its information source, carries certain risks.

Keywords

internet consumer finance, credit risk model, WeChat loan

1. Introduction

Installment consumer finance, which originated in the 19th century, enhances consumers' immediate purchasing power through credit tools and serves as a key driver for boosting consumption growth. On August 13 this year, the Ministry of Finance of the Central Government issued a "combination" of consumption policies, including a new interest subsidy policy and a "trade-in" subsidy, implementing interest subsidy measures for personal consumer loans of residents and loans for business entities in the consumer service sector. This marks the first "national subsidy" in the field of consumer loans at the central government level, reflecting the government's emphasis on promoting consumption. As an important component of consumer finance, Internet consumer finance plays a crucial role in leading innovation and promoting consumption, and therefore merits high attention.

There are numerous differences between Internet consumer finance and traditional consumer finance. The core difference lies in that Internet consumer finance companies, relying on Internet platforms, use big data to conduct real-time analysis of users' behavioral data, refine risk pricing granularity to the individual level, and achieve technology-driven risk diversification. As a result, their default rate is reduced by more than 50% compared with traditional finance. It also boasts leading advantages in certain technologies: short loan disbursement time and high efficiency; realization of dynamic risk control through blockchain and AI

technologies, and in-depth application of data. These technological advantages have led to a high frequency of use of Internet consumer finance. Therefore, the construction of the credit system of companies acting as the main players in Internet consumer finance is of great research value.

2. Literature Review

2.1 Literature Review on Internet Consumer Finance

As a new type of financial service model integrating "Internet + consumer finance", Huang Xiaoqiang argues that Internet consumer finance refers to non-depositary lending companies established with capital from market entities such as banks, consumer finance companies, or Internet enterprises. It uses Internet technology and information and communication technology as tools to provide funds to individuals or households for meeting their consumption needs of goods and services other than housing and automobiles, with the obligation of repayment-a credit activity (Huang, 2015). Internet consumer finance is a product of the structural evolution of China's consumer finance market, reflecting the transformation from a single service provider (commercial banks) to diversified providers, and from offline face-to-face service channels to online remote connection channels (Sun, 2025). Compared with traditional consumer finance, Internet consumer finance can integrate resources more efficiently, drive residents' consumption more effectively, and promote economic developmen (Zhang, 2020).

Up to now, existing studies have shown that Internet consumer finance faces three types of risks: traditional financial business risks represented by credit risk, specific technical risks caused by technology application, and financial exclusion risks. In terms of quantitative assessment of these risks, the construction of indicator systems and the calculation and analysis of risk pressure indices have played a positive role; in terms of risk reduction, digital audit with functions of disclosure, prevention, and resistance is of great significance (Liu and Jin, 2025). Currently, the development of Internet consumer finance requires strengthening the construction of the credit reporting system, making full use of big data and cloud computing mechanisms, unblocking data information channels, integrating multi-party data, establishing and improving the protection of consumers' rights and interests in Internet consumer finance, and building a regulatory system to reduce the default risk of Internet consumer finance (Zhang et al., 2023).

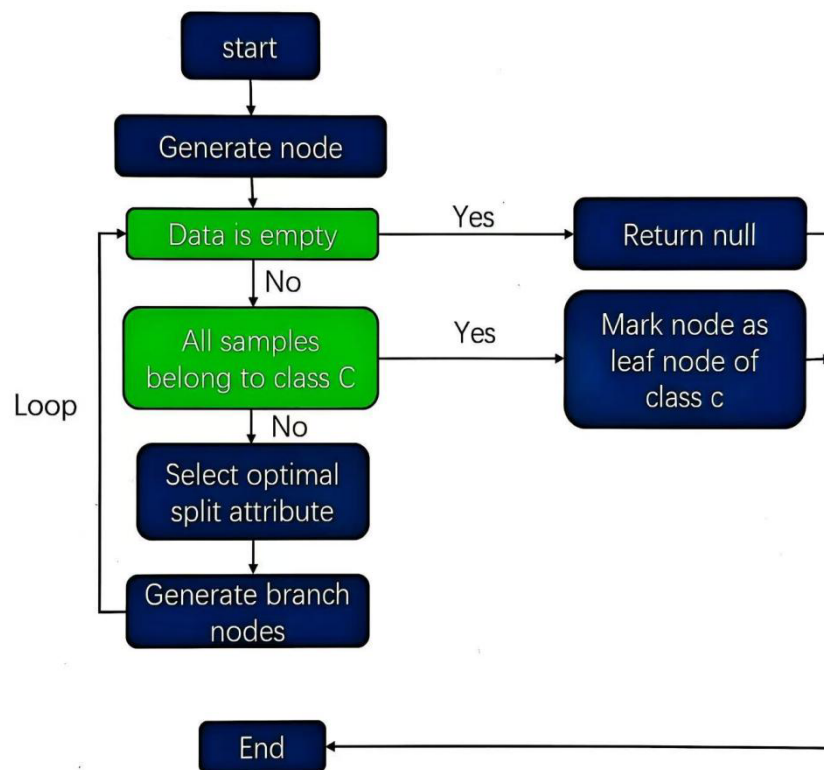### 2.2 Literature Review on Credit System Technology and Innovation

For a long time, the credit industry has experienced rapid development, with continuous expansion of scale and a shift in business format from offline-oriented to online-oriented. Meanwhile, the credit elements in the credit system have gradually changed: from salary and social security information (including income certificates, employer attributes, and social security payment status) to customers' transaction information. Transaction information mainly covers customers' various activities on Internet shopping platforms, including but not limited to the quantity and frequency of purchased goods, quality of reviews, timely payment behavior, and return/refund records. The transaction information recorded in the system serves as the basis for credit score evaluation and has become an important credit element referenced by the credit system.

The credit models of the credit system have also undergone phased changes. In the early stage of credit system construction, the main models used were traditional scoring card models based on the expert method and statistical methods. The expert method refers to an approach where professional credit review experts evaluate applicants based on the "5C" factors. By analyzing five dimensions of the borrower-Character (moral character), Capacity (repayment ability), Capital (capital strength), Collateral (collateral), and Condition (operating environment conditions)-experts comprehensively judge the borrower's credit status. This method is also known as the "5C Discrimination Method". Later, big data, statistical methods, and models were gradually introduced as evaluation factors.
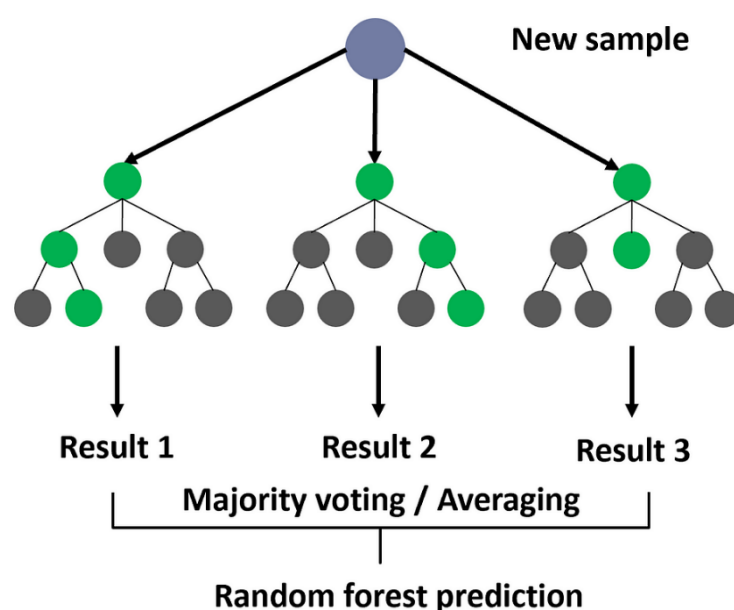
With the continuous development of credit models, machine learning models have shown broad application prospects in the field of credit evaluation. For example, the decision tree-an algorithm used for supervised machine learning and data mining-simulates the human decision-making process by constructing a tree-like model. As shown in the Figure 1, decision trees can handle both numerical and categorical features, exhibit good robustness, have a certain ability to process data with missing values, and can automatically capture the

interactive effects between features to improve the accuracy of prediction results. Therefore, this model can be used to predict the credit risk of small, medium, and micro enterprises as well as individuals, with high evaluation accuracy (De Ville, 2013).

Figure 1 Schematic Diagram of the Decision Tree Model

By cleverly combining and integrating decision trees based on the decision tree model, the prediction model "Random Forest" is formed. As shown in Figure 2, the Random Forest model takes decision trees as its basic units, and each decision tree is constructed based on a sample subset generated by different digital sampling methods, ensuring accuracy and independence. Machine learning models such as decision trees and random forests have the ability to mine hidden patterns and correlations from large amounts of historical data, thereby predicting individuals' credit status more accurately, enhancing the accuracy of applicant credit evaluation, and promoting the improvement of the credit system (Salman et al., 2024).

Figure 2: Schematic Diagram of the Random Forest Model

In recent years, many enterprises have begun to introduce artificial intelligence technology into the credit evaluation system, further improving the technical level of credit evaluation. Artificial intelligence technology enables machine learning models to undergo higher-level training, allowing in-depth analysis of multi-dimensional data of loan applicants, such as consumption records, social network behaviors, and historical lending information. The machine model trained by the artificial intelligence platform not only improves the accuracy of predicting applicants' repayment ability and evaluating default risks but also further provides more differentiated and targeted credit products for applicants of different credit levels. Thus, the level of credit evaluation has been further enhanced (Giudici and Raffinetti, 2023).

3. Core Technical Architecture of the Internet Consumer Finance Credit System: A Case Study of Webank

Webank is China's first Internet bank. Relying on its technological advantages, it has launched financial products such as "WeChat Loan", "Micro-Enterprise Loan", and "Webank Fortune +", providing comprehensive financial services (including bank accounts, deposit and wealth management, and small-sum credit) to a broad customer base in a convenient, efficient, and low-cost manner, with a total of more than 420 million individual customers served (Giudici and Raffinetti, 2023). In the process of developing inclusive products and addressing credit risks, Webank has given full play to its technological advantages, comprehensively applying means such as big data financial technology, constructing identity recognition and credit risk management systems, and blockchain technology to continuously improve and complete the core technical architecture of the Internet consumer finance credit system.

3.1 Overview of Webank's Credit Risk System

The core of Webank's credit system is its risk management system, and an important component of this system is the machine training model developed based on big data and using risk control algorithms. In the process of collecting customer information and conducting pre-loan credit evaluation using big data, Webank not only obtains customers' basic information but also collects data such as personal bank account information, enterprises' unified social credit codes, registered capital amounts, and registered currencies. Additionally, based on customers' social data, Webank effectively analyzes and predicts the possibility of loan fraud by integrating information such as network terminal devices, network IP addresses, users' operation behaviors, and online activity levels, thereby effectively reducing credit risks. To further accurately evaluate applicants'
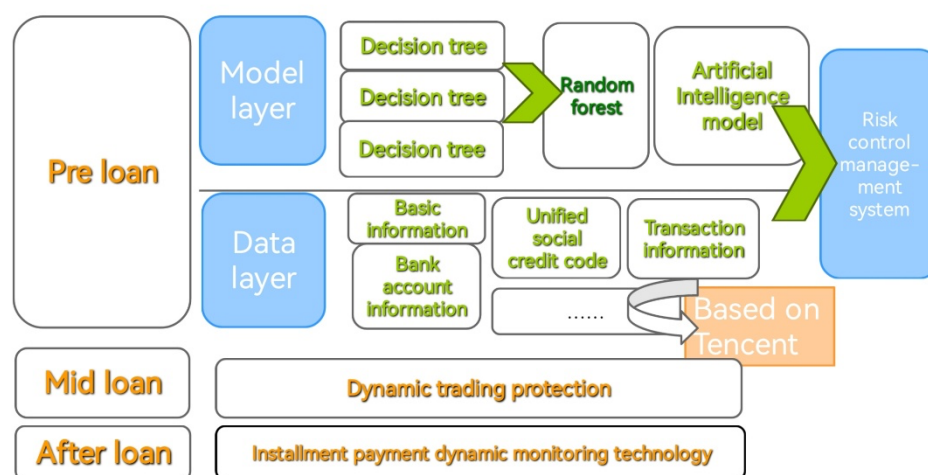
credit status, Webank uses a risk control algorithm based on big data and machine learning technology. This risk control algorithm has a wide range of data sources, including: traditional credit reporting records covering borrowers' personal information, credit records, and repayment history; social data obtained from Tencent's social networks; and the aforementioned machine training models that use algorithms such as Logistic Regression, Decision Trees, and Neural Networks. After model optimization and adjustment (e.g., cross-validation), the ability to acquire information and conduct credit evaluation has been enhanced.

Furthermore, Webank has adopted a security authentication method called "dynamic transaction protection". First, it collects users' transaction information as learning materials to understand their transaction habits-specifically including information such as users' frequently used transaction devices, common transaction counterparts, and usual transaction environments-and based on this, sets objective and dynamic security baselines for different customers. Webank's system compares the information elements of each transaction with the corresponding customer's security baseline. If there is a significant discrepancy between the two, additional verification methods (such as voice recognition or facial recognition) will be required for the customer to ensure low transaction risks.

During the loan repayment phase, the installment payment dynamic monitoring technology plays an important supplementary and supervisory role in the later stage of the loan. Webank's installment payment model dynamically monitors customers' debt-servicing capabilities based on their monthly repayment status and adjusts their credit status accordingly. This repayment method reduces the heavy financial burden on customers caused by repaying the principal and interest in a single lump sum, enhances customers' initiative in repaying loans, and facilitates the smooth recovery of bank loans.

For the process above, Figure 3 provides a systematic summary.

Figure 3 Schematic Diagram of Webank's Credit Risk System

3.2   Operation Process of WeChat Loan

Webank's most representative product is WeChat Loan. Credit business mainly includes links such as fund-raising, customer acquisition, credit evaluation, risk assessment, loan disbursement, post-loan management, and the establishment of risk management models.

In the application process of "WeChat Loan", Webank has developed a new credit reporting system that incorporates innovative risk identification and algorithm technology using blockchain technology. This system collects users' transaction behavior information through big data technology. Webank constructs a personal credit risk evaluation model based on big data, which improves the accuracy of identifying fraud and agency-based loan applications.

In the pre-loan application process of "WeChat Loan", Webank first collects customers' credit information using big data and conducts credit evaluation. Based on the evaluation results, it determines whether the customer is eligible for inclusion in the whitelist. If the customer meets the whitelist criteria, access to apply

for "WeChat Loan" is granted, and a credit limit corresponding to their credit reporting status is provided. The entire process is conducted online, ensuring high security. Meanwhile, the results of this credit evaluation are dynamically summarized from data of various authorized blockchain information chains, resulting in higher accuracy in information content.

During the in-loan phase, Webank conducts real-time dynamic monitoring throughout the process to reduce credit risks and prevent fraudulent behaviors. In the post-loan risk control phase, Webank uses its credit reporting system to monitor changes in customers' information in real time. Based on actual conditions, it formulates corresponding strategies for potential credit risks and selects appropriate collection methods to achieve timely loss control, thereby reducing credit risks.

4. Differences Between the Internet Consumer Finance Credit System and the Credit System of Traditional Financial Institutions

The differences between the Internet consumer finance credit system and the credit system of traditional financial institutions mainly lie in two aspects: information sources and technology application.

First, the most significant difference between the two systems is their information sources. In the Internet consumer finance credit system, Internet credit platforms integrate borrowers' traditional credit reporting records (including personal information, credit records, and repayment history) as well as comprehensive information such as network terminal devices, network IP addresses, users' operation behaviors, and online activity levels. They use big data to collect a wide range of transaction information to accurately evaluate customers' credit ratings and transaction capabilities (Mu and Li, 2025). Compared with traditional financial institutions that rely on expert evaluation and statistical methods, the Internet consumer finance credit system is undoubtedly more comprehensive and complete, enabling effective credit risk management.

Second, the Internet consumer finance credit system has many innovative technical features that the traditional credit system lacks. For example, by training machine learning models and artificial intelligence, and constructing credit risk control systems, the Internet consumer finance credit system not only reduces labor costs but also improves the accuracy and risk resistance of credit evaluation. The implementation of real-time dynamic monitoring during the in-loan and post-loan phases throughout the credit process further ensures the timely recovery of loans.

However, Internet consumer finance does not always reduce credit risks; it may also lead to misjudgments. First, due to its online nature, the Internet consumer finance credit system faces the problem of data pollution, resulting in deficiencies in the accuracy of depicting customers' credit risks. Second, since the Internet consumer finance credit system obtains information from more diverse dimensions, there is a certain risk of fraud in the acquired information. For instance, behaviors such as "brushing orders" (fake transactions to inflate data) and frequent returns after purchases can make the data inaccurate and untrue. Third, compared with data in the traditional credit system (such as personal social security and personal tax data, which have undergone multi-party verification), the data obtained by the Internet consumer finance credit system is subject to less stringent verification. Fourth, the data liquidity of China's Internet consumer finance credit system is relatively weak. Such data is often held by a single platform entity and has not undergone comprehensive verification. Compared with the traditional credit system, the construction of the Internet consumer finance credit system started later and is still incomplete, with some weaknesses in risk control management. This creates opportunities for illegal individuals who are familiar with algorithms to exploit loopholes, indicating that the system still has significant room for improvement.

5. Conclusions and Prospects

In summary, this study draws the following conclusions:

First, the credit scoring system has undergone technological evolution from expert scoring cards and machine learning models to technologically innovative artificial intelligence. Meanwhile, significant changes have occurred in information sources-shifting from salary and social security information (including income certificates, employer attributes, and social security payment status) to customers' transaction information.

Second, through the case analysis of Webank (an Internet consumer finance company), we found that the modern Internet consumer finance system comprehensively applies modern technological means such as risk control algorithms, dynamic transaction protection, and installment payment dynamic monitoring technology to improve the construction of the credit system. This system has strong reference value and leading significance.

Third, compared with the traditional credit system, the Internet consumer finance credit system has numerous differences, such as different information sources, different technical levels, and different risk profiles. It is necessary for us to correctly recognize the advantages and shortcomings of the Internet consumer finance credit system.

Based on the above research conclusions, this paper puts forward the following suggestions:

First, the traditional credit scoring system should continuously enrich the sources of information and data, improve the level of technological innovation, and reduce the credit risk of loans.

Second, modern Internet consumer finance enterprises should continue to develop machine training models, enhance the accuracy of algorithm calculations, and comprehensively apply various technical means to reduce risks and prevent fraudulent behaviors.

Third, internet consumer finance companies should leverage their technological advantages, strengthen their technological innovation capabilities, foster new main players in Internet consumer finance, and promote the innovative leadership and healthy development of the Internet consumer finance ecosystem.

Fourth, regulatory authorities need to strengthen supervision, actively promote data circulation, facilitate the sharing and joint verification of data resources, enhance the accuracy and security of data, and improve the legal and regulatory framework for supervision (Wang and Liu, 2024).

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Conflicts of Interest

The authors declare no conflict of interest.

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