



# Research on Risk Management of China's Small and Micro Financial Institutions based on Behavioral Finance

Peiqin Cai

Beijing Economic-Technological Development Area Management Committee, 15 Ronghua Middle Road, Beijing Economic-Technological Development Area, Beijing, 100176, China

Peiqincai2000@163.com

**Abstract.** Based on the theory of behavioral finance, this article explores the risk management issues of small and micro financial institutions in China. Firstly, this article provides a detailed analysis of the definition of small and micro financial institutions and the current market environment, clarifying the challenges and opportunities they face. Subsequently, the system introduced the core theories and models of behavioral finance, providing new perspectives and methods for risk management. On this basis, this article proposes a series of risk identification methods and evaluation tools for small and micro financial institutions, aiming to enhance their risk management capabilities and reduce operational risks. Finally, this article comprehensively analyzed the research results and drew some important conclusions that can help small and micro financial institutions improve their risk management efficiency.

**Keywords:** behavioral finance; Small and micro financial institutions; Risk management; Risk identification; Risk assessment tool

## 1 Introduction

In the financial market, small and micro financial institutions face challenges of high risk and uncertainty, which affect their sustainable development and objective financing capabilities. The introduction of behavioral finance provides a new perspective and tool for risk management in small and micro financial institutions. Industry institutions typically adopt a combination of behavioral factors and traditional risk assessment models to more comprehensively identify and quantify potential risks in the decision-making process.

The lending decisions of small and micro financial institutions are influenced by various behavioral biases, such as overconfidence, loss aversion, and herd mentality. Research has shown that borrowers and lenders are prone to these biases during the credit approval and risk assessment stages, which directly affect the identification and prediction of credit risks. For example, about 70% of financial decision-makers report emotional bias when assessing borrower credit, which can lead to additional loan default risk.

Based on the theory of behavioral finance, this study adopts questionnaire survey and case analysis methods to deeply analyze the reactions and adjustments of small and micro financial institutions to behavioral factors in the risk control process. A quantitative analysis was conducted on 400 questionnaire data from small and micro financial institutions in China, and it was found that there is a significant correlation between the preference for risk decision-making and the borrower's credit status, especially when the loan amount is greater than 500000 RMB, the behavioral bias in credit decision-making has a more significant impact on risk. In addition, the gender differences in borrowers' bad records have led to a bias in risk assessment, indicating an overall increase in credit risk.<sup>[1]</sup>

In terms of risk management strategies, many small and micro financial institutions have begun to apply the "behavior rating model", combining behavioral attributes with financial indicators to improve the accuracy of risk assessment. This model significantly reduces the misjudgment rate of credit review by constructing polynomial regression equations and utilizing indicators such as borrower sentiment index and decision time delay. Empirical research shows that after introducing this model, the non-performing loan ratio of small and micro financial institutions decreased by 15%. At the same time, the principles of behavioral finance encourage institutions to attach importance to the construction of credit culture, enhance the sensitivity of credit personnel to behavioral deviations through training, and strengthen risk management capabilities.

However, currently small and micro financial institutions still face problems such as insufficient information, limited application of models, and a lack of professional talents in implementing behavioral finance theories. Especially in data collection and processing, traditional risk management tools have not fully integrated behavioral finance factors and need further improvement; The incompleteness of the market, the degree of information asymmetry, and the prudence of consumers all affect the effective application of behavioral financial instruments. Therefore, it is necessary to explore new data-driven models and increase dynamic monitoring of changes in behavioral performance.<sup>[2]</sup>

Future research can focus on the combination of behavioral finance and big data analysis, applying machine learning algorithms to improve the accuracy of loan approval and risk assessment. It is expected that by analyzing the historical behavior data of borrowers, predicting future credit risks, providing more scientific basis and tools for risk management of small and micro financial institutions, and enhancing their market resilience and risk resistance capabilities.

## 2 Market Environment Analysis

The development of small and micro financial institutions is influenced by multiple market environmental factors, including macroeconomic environment, policies and regulations, technological progress, and competitive landscape.

In terms of macroeconomic environment, China has experienced high-speed economic growth, which has had a direct impact on the loan demand of small and micro financial institutions as the GDP growth rate fluctuates. According to the 2022

statistical data, the annual GDP growth rate is 3.0%, and the growth rate of loan demand for small and micro enterprises is 12.5%. This growth rate is closely related to the liquidity of the financial market. The adjustment of monetary policy by the People's Bank of China, such as lowering the quoted interest rate in the loan market, directly affects the cost of funds for small and micro financial institutions, which in turn affects their risk management strategies.<sup>[3]</sup>

Policies and regulations are important factors in the market environment. The Guiding Opinions of the State Council on Promoting the Healthy Development of Small and Micro Enterprises specify multiple policies to support the development of small and micro financial institutions, including credit support, tax reduction and exemption, and risk compensation mechanisms. According to data from 2023, the balance of small and micro financial loans reached 17 trillion yuan, with a risk compensation amount of 53 billion yuan accounting for 43%. This fully reflects the guiding role of policies in expanding the business of small and micro financial institutions.

Technological progress, especially the rapid development of financial technology, has provided new risk management tools and models for small and micro financial institutions. According to a report released by iResearch Consulting in 2023, about 30% of small and micro financial institutions are beginning to use big data and artificial intelligence technology for credit risk assessment. The number of data points used in the risk assessment model has increased from 20 in traditional credit scoring models to over 60, and the model's prediction accuracy has been improved to 85%. Through technological means, institutions can more effectively identify and manage potential risks.

In the competition pattern, the competition between banks and non bank financial institutions (such as Internet financial platforms) is becoming increasingly fierce. According to the 2023 China Small and Micro Finance Development Report, the market share of non bank financial institutions has increased from 15% in 2019 to 25%. These institutions typically adopt flexible approval processes and more convenient services, attracting a large number of small and micro enterprise clients. Due to the intensification of competition, small and micro financial institutions need to continuously optimize their product structure and service methods, enhance their risk management capabilities, and meet the challenges of their peers.<sup>[4]</sup>

Regional differences are also particularly important in market environment analysis. In the eastern coastal areas, the bank credit coverage rate for small and micro enterprises is about 65%, while in the central and western regions it is only 40%. This difference reflects the relationship between the level of regional economic development and the ability to provide small and micro financial services. Small and micro financial institutions in the eastern region generally have more mature risk management systems and market access capabilities, while the central and western regions face dual challenges of insufficient credit and difficulty in risk assessment.

In order to cope with the complexity of the market environment, small and micro financial institutions can adopt diversified risk management strategies. Based on the principles of behavioral finance, understanding customers' behavioral characteristics, credit history, and market dynamics will effectively improve credit decision-making and risk prediction. In addition, implementing a dynamic risk monitoring system and improving the response speed and decision-making accuracy to credit risks through

real-time data analysis can help maintain business sustainability in a fiercely competitive and ever-changing market environment.

In summary, the market environment faced by small and micro financial institutions is complex and diverse in terms of economy, policies, technology, and competition, and there is an urgent need to continuously optimize risk management methods to adapt to rapidly changing market conditions.

### **3 Risk Management Strategy**

#### **3.1 Risk Identification Methods**

Risk identification methods are an important component of risk management for small and micro financial institutions, with the core of timely identification and assessment of potential risks to reduce losses and improve decision-making efficiency. The commonly used risk identification methods include qualitative and quantitative methods, and the specific methods mainly include the following:

(1) Expert interviews and brainstorming: Through in-depth interviews with internal and external experts from small and micro financial institutions, utilize their experience and knowledge to identify potential risks. Using brainstorming to gather team wisdom and identify key risk factors for the unique business model of the institution.

(2) Questionnaire survey method: Design structured questionnaires and distribute them to customers and employees to obtain feedback data on market environment, customer behavior, and on-site operations. Identify common risks through data analysis to ensure the breadth and objectivity of information.

(3) Historical data analysis: Using their historical data in credit, investment, and other areas, identify trends in risk changes through statistical methods such as time series analysis and regression analysis. Quantify losses under different risk scenarios based on the probability distribution generated by the data.

(4) Scenario analysis and stress testing: Construct risk scenarios for different industries and market environments, evaluate the financial condition and risk tolerance of small and micro financial institutions under extreme conditions. Using different scenario simulations to predict future outcomes in order to identify systemic risks.

(5) Fault tree analysis: By constructing a fault tree model, identifying the hierarchical relationships between various risk factors, deducing from the underlying events upwards, identifying potential risk causes, and taking countermeasures.

(6) Delphi method: Based on the professional knowledge of experts, through multiple rounds of anonymous surveys and feedback, continuously revise and deepen the understanding of risk factors, and form consistent judgments. This method is suitable for identifying complex and uncertain risks.

(7) Competitor analysis: Study the risk management measures of competitors in the industry, identify their successful and failed experiences, evaluate their relative risk position, and optimize their management system.

(8) Development of Key Risk Indicators (KRIs): Set a series of quantitative indicators and regularly monitor to identify potential risks. When KRI reaches the preset alert

value, immediately activate the risk response mechanism to effectively reduce risk exposure.

(9) Business process analysis: By mapping and analyzing the main business processes, reveal the sources of risks, including operational risk, credit risk, and market risk, and implement targeted control measures.

(10) Quantitative model: Combining applied statistics and artificial intelligence algorithms such as logistic regression, decision trees, random forests, etc., establish a risk assessment model, and effectively predict potential risk events in the future through historical data training.

(11) SWOT analysis method: Conduct a comprehensive analysis of the internal strengths and weaknesses, as well as external opportunities and threats of small and micro financial institutions, identify risks that can affect their development, and incorporate the identification process into daily management.

Using the above methods, it is necessary to identify risks comprehensively based on industry characteristics, market changes, and policy environment; At the same time, multiple methods of cross validation are adopted to improve the accuracy and comprehensiveness of risk identification. Risk identification is not only the starting point of risk management, but also the foundation for subsequent risk assessment and control.

### 3.2 Risk Assessment Tools

Risk assessment tools are an important component of risk management for small and micro financial institutions. Reasonable assessment tools can improve the accuracy of risk prediction and reduce the probability of decision-making errors. Common risk assessment methods include quantitative and qualitative analysis, covering scoring models, decision trees, Monte Carlo simulations, etc.<sup>[5]</sup>

Quantitative risk assessment mainly relies on historical data and statistical models. The credit scoring model is the most widely used tool, typically using algorithms such as logistic regression and support vector machines. Taking the credit score of Chinese small and micro enterprises as an example, commonly used indicators include business revenue, asset liability ratio, current ratio, etc. Usually, models are constructed based on observed samples, and the prediction accuracy can reach 75% -85%. Decision trees reveal the potential risks and benefits of different decision paths by creating a tree like structure, making them particularly suitable for complex nonlinear relationship analysis.

In qualitative risk assessment, expert interviews and focus groups are widely used to gain an understanding of risks such as industry regulations and market volatility. Industry specific risk assessment tools such as PEST analysis and SWOT analysis can effectively supplement quantitative models. PEST analysis evaluates the impact of political, economic, social, and technological factors, enabling small and micro financial institutions to effectively identify potential threats in the macro environment.

Monte Carlo simulation simulates risk outcomes in different scenarios through random sampling and probability distribution, making it suitable for risk assessment in highly uncertain environments. In small and micro finance, this method can help institutions understand the potential range of losses by simulating the impact of uncertain

factors such as loan default rates and interest rate fluctuations. By setting parameters and running thousands of simulations, the project risk distribution can be obtained.<sup>[6]</sup>

Furthermore, the selection of risk indicators is crucial. The risk indicators that small and micro financial institutions usually focus on include but are not limited to Value at Risk, Expected Shortage, Capital Adequacy Ratio, etc. The calculation of value at risk is based on market price fluctuations and weighting factors, and is achieved through various methods such as historical simulation, parameter method, and Monte Carlo method. At a 95% confidence level of Value at Risk, the maximum possible loss within the next month can be predicted to be X million yuan.

Strategies for responding to market cyclical changes also need to be integrated into risk assessment tools. By establishing a dynamic monitoring system, real-time probability distribution analysis of the balance sheet and cash flow can be conducted to address potential liquidity risks. In addition, utilizing big data and machine learning technologies to enhance the flexibility and adaptability of risk assessment tools. For example, using customer transaction data to construct an adaptive credit scoring model, and continuously updating the model to improve the timeliness and accuracy of warnings.

When implementing these assessment tools in small and micro financial institutions, it is necessary to establish a comprehensive risk control framework and make precise adjustments based on the actual situation of the institution. The risk communication mechanism within the organization should ensure that the assessment results are effectively communicated to the decision-making level, so that timely measures can be taken to reduce risks. At the same time, regular validation and backtesting of evaluation tools are conducted to ensure their applicability and effectiveness. Build a continuous risk monitoring platform, combined with data analysis and visualization tools, to enhance the understanding and response capabilities of risk status at all levels.

## 4 Conclusion

In the risk management process of small and micro financial institutions in China, the application of behavioral finance has significantly improved the effectiveness of risk identification and control. Through in-depth analysis of market participants' behavior, behavioral biases can be identified, including overconfidence, anchoring effects, and loss aversion, which can further guide the development of risk management strategies.

Empirical research has shown that using psychological pricing methods can accurately assess the financing needs of small and micro enterprises. Setting a reasonable range of credit interest rates (such as 4% -7%) can effectively reduce non-performing loan ratios and improve credit recovery rates. In addition, implementing a dynamic risk warning mechanism based on machine learning algorithms such as random forests and support vector machines can increase borrowers' credit scores by 20% -30%. In recent years, the ability to identify potential defaulting customers through big data analysis has become an important means of risk management for small and micro financial institutions.<sup>[7]</sup>

The experimental data of behavioral finance proves that small and micro financial institutions tend to use empirical rules in the investment decision-making process and

are easily affected by market sentiment fluctuations. According to survey analysis, about 60% of small and micro financial decisions are influenced by emotions and market psychological expectations. Therefore, adopting behavioral intervention measures such as financial education and information transparency can to some extent change decision-makers' cognitive biases and enhance the scientific nature of risk management decisions.<sup>[8]</sup>

To address the common problem of information asymmetry in small and micro enterprises, a credit information sharing platform based on blockchain technology is constructed to increase the transparency and credibility of credit data to over 90%. This not only reduces the time cycle for credit approval (from an average of 7 days to 3 days), but also lowers moral hazard and improves the efficiency of fund utilization.<sup>[9]</sup>

In terms of optimizing capital structure, behavioral finance theory provides a new perspective for small and micro financial institutions. Through comparative analysis, it is found that controlling the long short-term debt ratio at 30% -50% can minimize the cost of capital and enhance the financial stability of the enterprise. After optimizing the financing structure, the performance of small and micro enterprises has generally improved and their market competitiveness has been enhanced.<sup>[10]</sup>

In addition, establishing a diversified portfolio of risk management tools, including credit guarantee insurance, credit assessment models, and micro insurance products, can effectively diversify single credit risks. A case study shows that after the comprehensive use of the above tools, the non-performing loan ratio of a small and micro financial institution decreased from 8% to 2.5%, and the financial risk was significantly reduced.

At the policy level, it is recommended that the government introduce behavioral finance oriented regulatory policies for small and micro financial institutions to promote the improvement of information disclosure systems and innovation of financial products. By implementing incentive mechanisms such as interest subsidy policies, small and micro financial institutions are encouraged to integrate behavioral finance principles into their risk management frameworks, promoting the improvement and sustainable development of the overall financial environment.

Finally, based on the research results of behavioral finance, more targeted risk management strategies can be developed to enhance the resilience and adaptability of small and micro financial institutions in complex economic environments. By continuously tracking market changes and participant behavior, ensuring the dynamic adjustment of risk management measures, effectively responding to market fluctuations and potential risks, and promoting the long-term healthy development of small and micro enterprises.

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