Original Research Article

Analysis of "Data pledge" financing mode in the era of big data

Ling Li

School of Finance, Harbin University of Commerce, Harbin, Heilongjiang, 150001, China

Abstract: Financing difficulties have long been a major challenge for small and medium-sized enterprises in our country. The main reasons include the lack of smooth direct financing channels, complex and difficult bank loans, limited internal financing funds, and immature other indirect financing channels. In the era of big data, new financing models have emerged: "data pledge" financing has creatively opened up a new path for SMEs to obtain funding. This model relies on transaction behavior data from enterprises, leveraging cloud computing and big data technologies to establish a scientific, rigorous, and reasonable credit system and data model. It conducts credit rating analysis on enterprises, effectively addressing the issue of financing difficulties faced by SMEs.

Keywords: Big data, data pledge, credit rating

Foreword

Small and medium-sized enterprises (SMEs) form the largest group in China's market economy system. According to relevant statistics, 99% of businesses in China are SMEs. These enterprises contribute over 60% to GDP, more than 50% to tax revenue, and provide 80% of urban employment, playing a crucial role in the country's economic development. Despite this, SMEs still face long-term difficulties in financing, struggling to secure sufficient funds from banks, while private lending incurs high financing costs. This article begins by addressing the issue of financing difficulties for SMEs, analyzing the emergence, implementation model, credit risk concepts, and their significance of the "data pledge" financing model. The aim is to help SMEs find a new financing approach to solve their financing challenges.

1. Financing status and reasons of small and medium-sized enterprises in China

1.1. China's small and medium-sized enterprise (SME) financing landscape

Currently, China's economy is undergoing a systemic transition, characterized by underdeveloped market mechanisms and institutional immaturities. SMEs, which entered the market at a later stage, face significant constraints in accessing capital, with limited funding channels and constrained liquidity. This financial bottleneck has become the primary obstacle to SME growth. Key challenges include inadequate initial capitalization, weak internal capital accumulation capacity, and persistent funding shortages. These issues stem from both internal enterprise limitations and external environmental factors, resulting in SMEs exhibiting pronounced characteristics such as elevated financing hurdles, heightened risk exposure, and elevated borrowing costs.

1.2. Underlying causes of sme financing difficulties in China

1.2.1. Enterprise-specific factors

(a) Limited capital base

Chinese SMEs often lack sufficient startup capital, with constrained financial resources exacerbating cash

flow bottlenecks during operational phases.

(b) Collateral and guarantee challenges

SMEs frequently possess insufficient collateral assets, coupled with high collateral discount ratios. Fragmented appraisal processes involve high fees, bureaucratic inefficiencies, and inconsistent valuation standards. Additionally, securing reliable guarantors remains a significant hurdle due to asymmetric risk-sharing mechanisms.

(c) Low enterprise quality and creditworthiness

Most SMEs operate on small scales, with low technological innovation levels, fragile capital structures, and inadequate risk-resilience. Their financial reporting systems are often poorly structured, marked by inconsistent accounting practices, weak credit histories, and limited awareness of credit discipline. These factors collectively reduce their appeal to financial institutions.

1.2.2. Financial institution factors

(a) Structural flaws in banking credit management

Rigid credit assessment frameworks and centralized decision-making processes within banks suppress grassroots-level lending enthusiasm. Excessive risk aversion and stringent documentation requirements further restrict SME access to credit.

(b) Imbalanced financial institution structure

The fragmented regulatory oversight of SMEs—spanning multiple administrative tiers and sectors—has hindered the establishment of specialized financial oversight bodies and a comprehensive credit guarantee system. This institutional gap leaves SME financing needs underserved, perpetuating systemic funding shortages.

1.2.3. Government and institutional factors

(a) Policy inadequacies

China's policy framework lacks targeted measures to support SME financing. Critical gaps include underdeveloped direct financing channels, insufficient auxiliary infrastructure for credit services, and inadequate public financial literacy initiatives.

(b) Weak public service provision

Insufficient government investment in SME support systems—such as credit rating platforms, risk-sharing mechanisms, and financial education programs—has further constrained SMEs' ability to navigate complex financial ecosystems. The absence of a robust institutional safety net amplifies their vulnerability to funding disruptions.

2. The generation, implementation mode and credit risk concept of the financing mode of "data pledge"

2.1. Emergence of "Data pledge" financing

Since the early 21st century, the rapid expansion of domestic internet infrastructure has driven enterprises to adopt digitalized transaction practices. This shift has underscored the critical role of data in enhancing banks' risk management capabilities. With advancements in big data technology, institutions can now leverage integrated databases and algorithmic models to streamline data collection, organization, and analysis. These tools enable precise credit assessments by dynamically evaluating an enterprise's financial health through transactional and behavioral metrics. By utilizing real-time operational data and cross-validated behavioral

insights, financial institutions can extend credit and provide tailored financing solutions—this paradigm is termed the "data pledge" financing model.

2.2. Operational framework of "Data pledge" financing

The implementation of this model relies on advanced big data integration across internal corporate systems and external digital platforms. Core processes include:

Data Aggregation: Synthesizing transactional, logistical, and financial data from diverse sources.

Pre-qualification and Fraud Mitigation: Deploying predictive analytics to assess business viability and detect anomalies.

Dynamic Credit Scoring: Utilizing machine learning models to evaluate enterprise health and assign credit ratings.

Post-Disbursement Surveillance: Implementing real-time monitoring systems to track repayment capacity and mitigate defaults.

This framework connects enterprises with financial institutions by providing transparent, data-driven insights. By centralizing data sharing through a dedicated platform, the system fosters collaboration under principles of "government oversight, enterprise-led operations, data interoperability, cost-based access, regulatory compliance, and standardized protocols." This ecosystem ensures timely credit access for SMEs while addressing systemic information asymmetries.

2.3. Credit risk dimensions of "Data pledge"

Assessment Function of Data

For financial institutions, transactional data serves as a dual assessment tool:

Entity Creditworthiness: Banks monitor real-time shifts in an enterprise's creditworthiness via cash flow, supply chain activity, and operational metrics.

Transaction-Specific Risk: Data streams (e.g., payment histories, inventory turnover) inherently reflect the risk profile of individual deals.

Collateral Role of Data

In the digital age, data functions as a de facto collateral mechanism. When enterprises seek financing, they grant banks access to their transactional data as a "data pledge." This authorization enables lenders to:

Validate borrower credibility through verifiable operational metrics.

Mitigate default risks by continuously monitoring compliance with loan terms.

Establish a self-reinforcing cycle where data transparency reduces lending costs and enhances SME accessibility to credit.

3. The impact of "data pledge" financing mode

3.1. Impact of the "Data pledge" financing model on enterprises

The big data-driven enterprise credit assessment framework enables an objective and comprehensive evaluation of business operations, fostering transparency and encouraging enterprises to cultivate a culture of integrity. By generating credit reports, businesses can validate their creditworthiness, while real-time data integration during transactions and loan approvals mitigates historical challenges such as fragmented information and operational inefficiencies.

This model transforms operational data into tangible credit assets, enabling the development of innovative financing instruments and monetizing data value. It simultaneously enhances the enterprise credit ecosystem by integrating quantitative management, multi-faceted analysis, and optimization strategies for financial systems, human resources, asset allocation, and operational performance. The resulting credit evaluations serve as the foundation for financing decisions, thereby elevating enterprises' financial management capabilities.

A financial incubation platform is constructed based on an industry-specific database system, encompassing 36 major industries and over 200 sub-sectors. This infrastructure supports monitoring of more than 2,000 small and medium-sized enterprises (SMEs), combined with domestic and international industry analyses conducted by a dedicated think tank. The platform generates specialized analytical reports to guide strategic decision-making and future development directions.

3.2. Impact of the "Data pledge" financing model on banks

First, data collateralization allows banks to mitigate the high operational costs and risks traditionally associated with SMEs and agricultural finance, reducing these metrics to levels below conventional thresholds. This approach represents an efficient strategy for bulk onboarding of SME clients. Second, banks gain holistic insights into clients' financial behaviors and needs, enabling integrated financial services such as settlement, financing, wealth management, insurance, and leasing, all anchored in transactional data and collateralized assets. This fosters cross-selling opportunities and strengthens client engagement.

Lastly, the platform facilitates the integration of emerging internet finance products, such as peer-to-peer lending and crowdfunding. Once sufficient customer and data volume is accumulated, the platform can fully deploy these innovative services, unlocking new profit streams with lower capital intensity. This not only diversifies revenue channels but also positions banks as pioneers in leveraging digital ecosystems for sustainable growth.

4. Conclusion

The implementation of a credit reporting system within the "data pledge" financing framework effectively tackles the challenges of restricted and costly access to capital inherent in conventional credit assessment models. Leveraging its extensive data collection capabilities and multidimensional evaluation criteria, this system provides small and medium-sized enterprises (SMEs) with convenient, internet-based financial services characterized by swift processing. By integrating cloud computing infrastructure, the entire workflow—from data input to result generation—is fully automated via computational algorithms, minimizing human subjectivity and ensuring evaluation accuracy. Even when handling multiple assessment subjects concurrently, the system maintains high efficiency and precision. Furthermore, big data credit reporting synchronizes evaluation outcomes with real-time credit data updates, enabling dynamic recalculations of creditworthiness whenever a subject's financial profile changes. This ensures continuous alignment between credit assessments and current credit status. The advent of big data-driven credit reporting has enhanced information transparency, reduced systemic financial risks, optimized operational workflows, and incentivized financial institutions to actively engage in SME financing services. Collectively, these advancements hold significant implications for alleviating the persistent capital access barriers faced by small businesses in the current economic landscape.

Abut the author

Li Ling: 1996.09-, female, Han Nationality, Zhanjiang City, Guangdong Province, Harbin University of

Commerce in 2022.

References

[1] Chen Jianhua. Exploring the reasons of financing difficulties of small and medium-sized enterprises in China [j]. Contemporary Economy, 2011, (8): 58-59.

[2] Tang Shida, Li Zhihua, Li Xiaohong. The trend of supply chain finance: “1 N, N 1” and “data pledge” [J]. China Finance, 2015 (10).

[3] Victor Mayer-Schenberg. The era of big data [M]. Zhejiang: Zhejiang People’s Publishing House, 2013.