Study on the Integrated Financing Credit Service Model for Small and Micro Enterprises

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Abstract. Deepening financial services for small and micro enterprises is an important decision of the Party Central Committee and the State Council, yet the problem of financing difficulties for small and micro enterprises has not been effectively solved, which has seriously hindered the stable development of small and micro enterprises. In order to promote the construction of a national integrated financing credit service platform network to achieve high-quality development of small and micro enterprises, this study uses literature research and example analysis to analyse the development dilemma of integrated financing credit services in China, design the framework structure of the integrated financing credit service platform and explore the new model of integrated financing credit services in China in combination with the construction of a typical Chinese construction—the Qingdao station of CeLoan platform. The new model of integrated financing credit service with special features is proposed to strengthen the support of credit to the financing of small and micro enterprises, improve the platform system and help banks and other financial institutions to improve their ability to serve small and micro enterprises and other feasible suggestions, so as to promote the transformation and upgrading of China’s economy.

Keywords: Integrated financing credit service platform · Model · Small and micro enterprises · Credit information · Financing

1 Introduction

Small and micro enterprises (SMEs) are an important foundation for a stable economy and the main support for stable employment. In December 2021, the General Office of the State Council issued the Notice on the Implementation Plan for Strengthening Credit Information Sharing and Application to Promote Financing for Small and Medium-sized Enterprises, requiring the construction of a national integrated financing credit service platform, strengthening the collection and sharing of information including registration of market entities, tax payment, social insurance premium and housing fund payment, water, electricity and gas bills, etc., enhancing the ability of banks and other financial institutions to serve SMEs and continuously improving coverage, accessibility and convenience of loans for SMEs. However, China’s integrated financing credit service
platform for SMEs is still at a preliminary stage of development with bottlenecks to be broken through, low data utilization, poor sustainability and application functions of the information platform to be developed in depth. Therefore, it is imperative to optimize the environment for the development of SMEs, promote the development of integrated financing credit service platforms, explore effective information sharing, resource sharing and win–win cooperation forms to build an integrated financing credit service model with Chinese characteristics that suits the needs of China’s economic development.

2 Literature Review

Much of the existing literature examines the determinants of the SME financing gap, including the intrinsic characteristics of SMEs, market information asymmetries and the structure of the banking sector, and makes relevant recommendations to progressively further the development of an integrated financing credit service model. (Klapper, Sarria-Allende, & Zaidi, 2010) suggests that a new type of firm that is more market and profit oriented is emerging, and needs an improved business environment to facilitate its development, such as better credit and registration information. (Tefera, 2009) studied a sample of 195 enterprises in order to assess the determinants of SMEs’ access to finance in Nekemte town, concluded that access to finance for SMEs requires the cooperation of various stakeholders and recommended that service providers provide awareness, training, business planning and experience sharing for SME owners and that microfinance institutions remain flexible in terms of loan terms, loan procedures and loan size for SMEs. The contribution of (Osei-Assibey et al., 2012) investigated the determinants of financing preferences of SMEs while distinguishing a wider range of financing sources than is usually the case in the business financing literature. Credit registers were found to alleviate SMEs financing difficulties, in particular the existence of private credit registers can significantly improve the borrowing conditions of SMEs (Love & Mylenko, 2003). (Huo & Feng, 2010) argue that collective financing of unsecured assets does not increase the credit risk of banks and at the same time not only helps banks to reduce the cost of loan review, but also alleviates the problem of information opacity of SMEs, prevents the risk of default, lowers the threshold of access to finance for enterprises and also provides a new way to solve the financing problems of SMEs.

(Li Zhang, 2014) analyses the information asymmetry financing dilemma of SMEs and calls for measures to reduce the degree of information asymmetry among the subjects or to reduce the cost of commercial banks in handling credit operations for SMEs. The provision of credit services or the effective access to information channels, basic information of borrowers and lending information can also help commercial banks to effectively identify customers and improve the availability of financing (Bennardo et al. 2015). Improving the level of credit services for SMEs has important reference significance and practical significance for commercial banks in China to control credit risks and explore new ideas of risk management (Tian & Wang, 2016). In view of the current situation and existing problems of China’s SME financing model, (Zhang & Fan, 2018) proposes a new financing model for SMEs based on cloud services under the guidance of the government, integrating multiple social resources, improving the transparency and immediacy of SME financing information and reducing the risks of investors and online
platforms. Furthermore, the reputation of SMEs among their business partners plays an important role in accessing bank credit, and there is a need to adjust the behavior of banks and SMEs in order to improve their access to finance and thus improve bank-SME partnerships (Romdhane & Jebali, 2021). (Wang & Zhang, 2021) established a reputation evaluation model for SME financing risk to provide reference information for financial institutions to invest in SMEs, promoting good credit partnership between financial institutions and SMEs. From the perspective of inclusive finance, (Qian Shi, 2020) suggested that SMEs establish a systematic and scientific credit index system, which not only facilitates investors’ investment, but also reduces the lending costs of lending institutions, so as to prompt SMEs to improve and standardize themselves and improve credit ratings in order to obtain financing, thus forming a virtuous circle. (Qing & Jing, 2022) believes that the evaluation of financing capacity is important for improving SMEs’ technological lending capacity, and calls on the relevant authorities to pay full attention to the optimization of their own financing system and to continue to innovate financing methods to promote the development of SMEs. (Shi & Huang, 2022) argue that it is necessary to establish a multi-party joint financial services platform based on blockchain technology, which can help SME financing institutions reduce intermediate links and credit costs, and promote the development of SMEs and the real economy.

According to the analysis of the current situation of the research, most of the scholars’ research on financing credit services is at the stage of theoretical exploration, lacking analysis and summary of China’s actual construction experience. The integrated financing credit service platform is an important part of SME financing channels and the key to SME financing credit guarantee, how to achieve effective integration of credit collection on a national scale and solve existing problems to make the platform operate stably is also worth noting by scholars, therefore, this paper is in this context to carry out research, summarize the integrated financing credit service model of small and micro enterprises.

3 Key Technologies and Architectural Design of an Integrated Financing and Credit Service Platform

3.1 Technical System for Platform Construction

The integrated financing credit service platform makes comprehensive use of credit, technology and finance to achieve one-stop financing services with multi-scene support and full process coverage, providing financing facilities for SMEs nationwide. Among them, technologies such as big data, blockchain and artificial intelligence are important fulcrums for the integrated financing credit service platform to move from theory to practice.

Big Data Technology
Big data technology refers to a new type of information processing technology in which people and objects interact and upload data between the two through a third-party medium of computers, which categorize, fuse and process the data uploaded into the network. Through big data technology, it promotes model innovation and organizational change in financial institutions, builds visualized and controlled online business models,
realizes simultaneous offline and online business, reduces the cost of obtaining information in the financing process for SMEs and helps SMEs to be more scientific and comprehensive in the process of selecting financing channels.

**Blockchain Technology**
Blockchain technology is mainly composed of peer-to-peer transmission, distributed storage, authentication mechanism, smart contracts and digital encryption technology, which has unique technical advantages in enhancing information security, authenticity and establishing transparent trust relationships. The platform uses blockchain’s asymmetric encryption technology to reconstruct the way information is encrypted and recorded and then promotes the conversion of information transmission from traditional single-party transmission to multi-party joint transmission, authentication and maintenance through consensus mechanisms, solving the problems of mutual trust and security.

**Artificial Intelligence Technology**
Artificial intelligence technology, as the core driver of the new model of financing credit services, can conduct a comprehensive analysis of financing projects and make a correct assessment of the development potential of enterprises, intelligently screen messages and push a list of enterprises with financing requirements and steadily better personal credit so that funding support policies can really benefit high-quality SMEs with real needs.

### 3.2 Platform Framework Construction

Use data to speak, use data to make decisions, use data to manage, use data to innovate, make full use of big data, blockchain, artificial intelligence and other technologies, link enterprises, finance, and government through the data side to build a credit information sharing, intelligent and trustworthy credit financing service model for SMEs among government, banks and enterprises.

The Fig. 1 is a four-dimensional integrated architecture running through the data side, demand side, government side and financial side, using the data side to achieve information collection, data modeling, monitoring and early warning and other functions, the government side with the help of the platform to do a good job in policy support and recommend enterprise work, enterprises according to their own conditions on the demand side to publish financing needs and authorize platform permissions, financial side through customer screening, real-time docking, credit inquiry and credit support to complete financing decisions, multi-party joint efforts to ensure that the platform credit data is accurate, real-time and comprehensive, so as to achieve “one network aggregation” of enterprise financing needs and “one end acceptance” of financial institutions.

**Demand Side**
The demand side requires a comprehensive collection of financing needs from various industries, which is the focus of platform construction. On the demand side, industry
authorities need to be deeply involved in industry management, familiar with the characteristics of the industry, and build a variety of forms of bank-enterprise docking platforms to comprehensively gather the financing needs of various industries.

**Government Side**
The government side is the guarantee and driving force of the platform. On the government side, it has introduced diversified policies to boost the confidence of financial institutions in lending, established diversified risk mitigation and financing guarantee mechanisms, and provided policy guarantees to reduce credit risks for enterprises through incremental subsidies and risk compensation overlay. At the same time, a long-term mechanism of “white list” recommendation was established to screen creditworthy enterprises through a big data model and select key project undertakings and government funding support enterprises for recommendation to financial institutions.

**Data Side**
The data side is the foundation and core of the financing credit service platform, which is based on the integration and innovation of public credit data and banks’ credit data, aiming to crack the problem of information asymmetry between banks and enterprises. The data side includes data management functions such as data collection, cleaning, comparison, penetration and modelling. covers not only basic information, regulatory information, taxation, social security and other business information, but also includes data of high concern to banks and difficult to access, such as case information, financial
statements and intellectual property rights, constituting a comprehensive and objective set of “enterprise vital signs indicators”.

**Financial Side**
The financial side is the support and grip for building a financing and credit service platform. On the financial side, the Celoan platform is one of the few non-financial institution information platforms in China that have access to the financial city network, which has significantly improved the efficiency of the platform. At the same time, in order to improve the efficiency of bank-enterprise docking, the platform innovates to create an online financial supermarket, where financial institutions can publish loan products and dock with enterprises in real time, thus improving the lending efficiency of financial institutions.

The group is committed to creating a customer-centric credit service platform that allows enterprises to raise their needs, departments to issue policies, platforms to increase credit and banks to release loans.

**4 Case Study**

The Qingdao station of Celoan platform is the “model project” of Celoan platform, which is also an innovative model in exploring financing credit services in China. The Celoan platform in Qingdao has effectively played the role of credit in helping SMEs to solve their financial difficulties and serve the real economy, providing a model for the construction of an integrated financing credit service platform with high standards.

**4.1 Background**

Celoan platform refers to pure credit loans granted by financial institutions to SMEs based on enterprise credit data, independent construction of intelligent credit approval and risk control systems, or with the help of third-party enterprise credit evaluation and risk monitoring results. In recent years, the Party Central Committee and the State Council have attached great importance to the construction of social credit system and SME financing, and introduced a series of policies to promote SME financing. In April 2018, the General Office of the National Development and Reform Commission issued the “Notice on Exploring the Development of Credit Easy Loan”, introducing the concept of “Credit Easy Loan” for the first time. In September 2019, the National Development and Reform Commission and the China Banking Regulatory Commission jointly issued the “Notice on the Further Development of ‘Credit Easy Loan’ to Support the Financing of Small and Medium-sized Enterprises”, which clearly pointed out the need to further develop the work of “Credit Easy Loan”, propose six major initiatives including strengthening the collection and sharing of credit information, establishing a sound evaluation system, innovating loan products and services, innovating default risk disposal mechanisms, increasing local support and strengthening assessment incentives. This provides new ideas and methods to solve the financing problems of SMEs.

Qingdao City is a highland of SME clusters in China. According to the statistics of China Business Registration Network, as of April 2021, the number of SMEs registered...
in China Industry and Commerce has exceeded 10 million accounting for 99.8% of the total number of registered enterprises in the country, and the number of SMEs in Qingdao accounts for more than 99% of the total number of enterprises in the city. In terms of quantity, SMEs are closer to the basic plate of this economy and this is for the city of Qingdao which has a huge number of SMEs, and the survival status of SMEs in Qingdao greatly affects the economy and people’s livelihood.

4.2 Problems

Qingdao has a large number of SMEs, their main channel of financing is bank credit. However, with a short time of establishment, less asset accumulation, less sales income and less industry experience, many enterprises have not experienced a complete economic cycle, and it is likely that the ups and downs caused by one economic fluctuation will cause the death of a company and these potential risks will become barriers to banks from granting credit.

Firstly, it is difficult to gather high-value data. Platform generally lack core data on taxation, electricity, customs, social security, provident funds, etc. It is difficult to accurately identify the willingness and ability of enterprises to repay their debts and interest when they cannot grasp their real production and operation situation and credit situation.

Second, the support system of the policy system needs to be improved. Government departments are not sufficiently aware of data opening and lack the system, rules and standards of data opening, resulting in data being closed within various government departments. Commercial banks have yet to improve their digital management capabilities, with cumbersome and lengthy loan procedures, high comprehensive fees and the application of data elements in need of regulation, with digitalization remaining more at the operational level and requiring effective breakthroughs in building ecology, building scenarios and expanding users.

Third, the development of policy guarantee and risk-sharing institutions is unbalanced. The platform lacks a supporting risk sharing mechanism, the cost of enterprise default is low, financial institutions believe that they bear more risks and their willingness to participate is low, and it is difficult for the platform to effectively play credit enhancement services.

4.3 Implementation

Based on the above, Qingdao City combined its regional characteristics and adopted the platform self-build model to create a data sharing platform between government departments, public utilities and financial institutions. The whole city has formed a joint effort to rapidly promote the construction, implementation and operation of the Qingdao station of the Celoan platform.

The platform has collected over 30 million pieces of credit data from more than 70 units and 100 categories in the city in accordance with the method of “full volume of public data collected in real time and non-public data collected according to authorization”, and over 3 billion pieces of data have been authorized to be called. The data information of various indicators can be used to paint a comprehensive picture of the “Company
vital signs indicators”, which can be used to meet the requirements of financial institutions for credit risk management review and investment efficiency. At the same time, it improves the multi-party collaborative working mechanism to achieve a “seamless integration” of government data aggregation, bank credit services and corporate financing needs (Fig. 2).

4.4 Implementation Effect

Qingdao adheres to the orientation of benefiting enterprises, promotes the work related to Celen platform in all aspects, stimulates the innovation and creativity of SMEs, continuously optimizes the environment for the development of SMEs. The legal environment, financing environment, innovation environment have all improved, comprehensive ranking has gradually improved, rising by one place compared with 2021, and being shortlisted in the top ten in the country for the first time (Table 1).

The Qingdao Celen platform is led by the municipal government, with the Municipal Development and Reform Commission, the Central Branch of the People’s Bank of Qingdao, the Qingdao Banking and Insurance Regulatory Bureau and the Municipal Bureau of Big Data jointly starting construction in 2019. The platform fully exploits the value of credit information resources, expands enterprise financing channels, effectively drives regional enterprise development and project implementation and empowers the big data industry and high-quality economic and social development. From the Qingdao Celen Platform, it is found that up to now, 4 financial institutions have been enrolled.
Table 1. Qingdao SME Development Environment Assessment Score

<table>
<thead>
<tr>
<th>Year</th>
<th>Comprehensive ranking</th>
<th>Comprehensive score</th>
<th>Rule of law environment</th>
<th>Financing environment</th>
<th>Innovation environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>17</td>
<td>55.06</td>
<td>70.67</td>
<td>42.50</td>
<td>44.12</td>
</tr>
<tr>
<td>2021</td>
<td>11</td>
<td>63.43</td>
<td>82.53</td>
<td>51.42</td>
<td>47.28</td>
</tr>
<tr>
<td>2022</td>
<td>10</td>
<td>57.50</td>
<td>79.70</td>
<td>46.70</td>
<td>51.07</td>
</tr>
</tbody>
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In the platform, 68,149 platform enquiries have been made and 61,900 enterprises have been registered in total. Enterprises have submitted 366.1 million financing demands, a total of 253.83 million credits and 105.355 billion yuan in loans have been granted.

5 Discussion

The problem of difficult and expensive financing has long constrained the survival and development of SMEs, so it is important to use big data and financial technology to build an integrated financing credit platform for SMEs, leading by strengthening the sharing and integration of credit information, improving the financing credit service platform system, increasing financial policy support, improving the quality of financing services and helping alleviate the “difficult financing for enterprises and difficult lending for banks”. The new integrated financing and credit service platform will be led by strengthening the sharing and integration of credit information, improving the financing and credit service platform system, increasing the support of financial policies, improving the quality of financing services, helping to alleviate the dilemma of “difficult enterprise financing and bank lending” and forming an open, share and win–win credit service model.

5.1 Strengthening Credit Information Sharing and Integration

Strengthen the collection of credit information and collect it through multiple channels to ensure timely and efficient access to credit information. The credit information sharing mechanism was further improved and the scope of information sharing was expanded to include tax information, social security information, provident fund information, utility bill information, etc. Full use was made of modern technology to improve data and information, and a public credit information catalogue was compiled to break down “data barriers” and “information islands”. Strengthen the open sharing of credit information and continuously improve the accuracy, completeness and timeliness of data. Oversee the management and use of credit information, standardize information use permissions and use procedures and improve information sharing networks. Push relevant information in bulk according to regional, industry and other dimensions to provide customized financing credit services, which can be modelled with relevant units using blockchain technology and provide institution-related services using the decentralized nature of blockchain.
At the national video conference on “Strengthening credit information collection and sharing to help finance small and medium-sized enterprises” held on March 18, 2022, Qingdao’s Celoan platform made a typical experience exchange, and the relevant work was highly affirmed by the National Development and Reform Commission. The credit information sharing mechanism is an important tool for the administrative authorities to achieve scientific management, a measure for financial institutions to prevent financial risks and a need for enterprises and individuals to avoid mistakes in decision-making.

5.2 Improve the Financing Credit Service Platform System

In the vertical construction of the financing credit service platform, through optimizing the internal organization and function configuration, clarify the credit management responsibilities, improve the integrated financing credit service platform system at the provincial level, explore the participation of multiple entities, establish a sharing and linkage mechanism and form a “one-stop” financing service model online. In the horizontal construction of the financing credit service platform, pay attention to the role of the market, strengthen the docking of systems between different departments and industries and realizing timely information sharing and same-frequency sharing. The provincial social credit service platform should take the lead in coordinating internal resources and promoting mutual check and data sharing of cross-regional credit information so as to give full play to the pivotal role of the financing credit service platform in “uploading and sending”.

Improve the financing credit service platform system, jointly build government and bank, promote more accurate and comprehensive aggregation and sharing of information in various regions, optimize the way of data exchange and improve the availability of credit information. Since 2022, Qingdao’s Celoan platform has helped 1,176 enterprises solve their financing problems with a total financing scale of 17.36 billion yuan, and the amount of financing exceeded 10 billion yuan for the first time in a single month.

5.3 Improving the Quality of Financing Services

Innovate and develop financial products, improve the system of relevant financial products, develop financial products that follow the development of the times, directly match the financing needs of SMEs, expand the scale of loans to SMEs and innovate and develop standardized products such as credit reports and credit assessments for use by financial institutions.

And improve the incentive and compensation mechanism. With the government at the center, play a leading role in guiding financial institutions and other market players to jointly participate, share the risks arising from financing and introduce preferential policies such as loan discounts and financing guarantee subsidies.

Continuously improve inter-departmental coordination mechanisms, strengthen the co-ordination of risk compensation policies at the provincial, municipal and county levels, publicize the role of setting up risk mitigation or risk compensation funds, and support and advocate the exploration of various risk mitigation measures in accordance with the actual local situation. Further improve and reduce the process of the approval system, guide commercial banks to delegate credit and approval authority to grassroots
branches. In 2021, the balance of credit loans for SMEs in Qingdao increased by 30.03% year-on-year, the average interest rate of cumulative loans for inclusive SMEs decreased by 0.18 percentage points year-on-year and the approval and release time was shortened by 3–5 days year-on-year.

Therefore, the new model of integrated financing and credit services should be innovated, multi-linked and socially constructed, breaking through the credit information barriers between government departments and industries, and forming an integrated financing credit service platform with Chinese characteristics. However, the design of the integrated financing credit service model in this paper is still not comprehensive enough and needs to be improved through more in-depth investigation and research.

6 Conclusion

By understanding the current basic situation of the integrated financing credit service platform, investigating the management of the integrated financing credit service platform by government departments and conducting in-depth interviews with the heads of the neighboring small and micro enterprises and workers in the banking or insurance industry, this research group optimizes the integrated financing credit service model for SMEs, analyzes the typical case of the CeLoan platform Qingdao Station, fully combines the service model with real-life examples and summarizes the experience that can be promoted and replicated, and broaden the financing channels, so as to broaden financing channels, improve the capital structure of SMEs, promote the development of the national integrated financing credit service platform, provide theoretical guidance for the development of Internet finance and at the same time help enterprises to grow and develop, so that SMEs can fully grown up in the reform of China’s market economy and promote the realization of innovative national goals, providing strong support for accelerating the construction of a new development pattern and promoting high-quality development.

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